



- **Compact & Lightweight**
- **Models from 20kV-160kV, 300W, 600W and 1200W**
- **Universal Input, Power Factor Corrected**
- **Hot Anode or Hot Cathode X-Ray Tube Capable**
- **Standard Digital Interfaces: USB, Ethernet and RS-232**
- **CE Compliant, UL Recognized and RoHS Compliant**
- **User Programmable Ramping and Arc Detect Feature**

Spellman's new DXM Series of X-Ray generator modules are designed for OEM applications up to 160kV at 1200 watts. Its universal input, small package size and choice of three standard digital interfaces simplifies integrating the DXM into your X-Ray analysis system. Models are available to operate either floating filament (negative HV polarity) or ground referenced filament (positive HV polarity), X-Ray tube designs. DSP based emission control circuitry provides excellent regulation of emission current, along with outstanding stability performance.

### TYPICAL APPLICATIONS

- Plastics Sorting
- Crystal Inspection
- Plating Measurement
- Diamond Inspection
- Mineral Analysis
- X-Ray Fluorescence
- X-Ray Diffraction

### SPECIFICATIONS

#### Input Voltage:

- Power factor corrected input
- 100-240Vac  $\pm 10\%$  (90-264Vac):
  - 47-63Hz @ 4.6A for 300 watt units
- 200-240Vac  $\pm 10\%$  (180-264Vac):
  - 47-63Hz @ 4.3A for 600 watt units
  - 47-63Hz @ 8.2A for 1200 watt units

#### Output Voltage:

- 8 models—20kV, 30kV, 40kV, 50kV, 60kV, 70kV, 75kV and 160kV

#### Output Polarity:

- Negative- for floating filament X-Ray tubes
- Positive- for ground referenced filament X-Ray tubes

#### Power:

- 3 power ranges available:
  - 300 watts, 600 watts and 1200 watts.
  - Other power levels available on special order.

#### Output Voltage Regulation:

- $\leq 0.01\%$  of rated output voltage over specified input voltage range
- $\leq 0.01\%$  of rated output voltage for a full load change

#### Emission Current Regulation:

- $\leq 0.01\%$  of rated output current over specified input voltage range
- $\leq 0.01\%$  of rated output current for a change from 30% to 100% of rated output voltage
- Filament is disabled when kV is  $< 30\%$  of full scale output

#### Ripple:

- $\leq 1\%$ rms at  $> 20\text{kHz}$ ,  $0.1\%$ rms below  $20\text{kHz}$

#### Stability:

- $\leq 25\text{ppm/hr}$  after a 2 hour warm up

#### Temperature Coefficient:

- $\leq 50\text{ppm per degree C}$

#### Environmental:

- Temperature Range:
  - Operating:  $0^\circ\text{C}$  to  $40^\circ\text{C}$
  - Storage:  $-40^\circ\text{C}$  to  $85^\circ\text{C}$
- Humidity:
  - 20% to 85% RH, non-condensing.

#### Filament Configuration:

- Closed loop emission control regulates filament setting to provide desired X-Ray tube emission current.
- Two types are available: Floating Filament (ac output referenced to negative output voltage) and Ground Referenced Filament (dc output referenced to ground).

#### Output:

- 0-5 amps at a compliance of 10 volts, maximum.
- The filament loop is disabled when the kV output is less than 30% of full scale output to protect the X-Ray tube.
- Standard filament Preheat adjustable 0-2.5 amps.
- Other filament levels available on special order.

**Control Interface**

**Local Interface:**

Potentiometers are provided to adjust filament limit and preheat levels

**Remote Interface:**

USB, Ethernet and RS-232 are standard. All digital monitors have an accuracy specification of 2%

**Control Software:**

A Windows graphical user interface example is provided

**High Voltage Enable:**

A hardware based, dry contact closure will enable the power supply into the high voltage on mode

**Monitor Signals:**

Voltage and current monitor signals are scaled 0-10Vdc equals 0-100% of full scale, accuracy is 1%

**Dimensions:**

300/600 Watts: 4.75" H X 6" W X 12" D  
(120.65mm x 152.4mm x 304.8mm)

1200 Watts: 4.75" H X 12" W X 12" D  
(120.65mm x 304.8mm x 304.8mm)

160kV: 10.5" H X 19" W X 21.5" D  
(266.7mm x 482.6mm x 546.1mm)

**Weight:**

300/600 Watts: 14 pounds (6.35kg)  
1200 Watts: 26 pounds (11.8kg)  
160kV: 142 pounds (66.4kg)

**Cooling:**

Forced air

**Input Line Connector:**

IEC320 with EMI filter

**Output Connector:**

Depends upon polarity selected. See table and drawing. Other connectors and pinouts available on special order.

**Regulatory Approvals:**

Compliant to EEC EMC Directive. Compliant to EEC Low Voltage Directive. UL/CUL recognized, File E227588. RoHS Compliant. DXM160N1200 is not UL recognized.

**DXM SELECTION TABLE — 300W, 600W, 1200W**

kV	300 Watt		600 Watt		1200 Watt	
	mA.	Model	mA	Model	mA	Model
20	15	DXM20*300	30	DXM20*600	60	DXM20*1200
30	10	DXM30*300	20	DXM30*600	40	DXM30*1200
40	7.5	DXM40*300	15	DXM40*600	30	DXM40*1200
50	6	DXM50*300	12	DXM50*600	24	DXM50*1200
60	5	DXM60*300	10	DXM60*600	20	DXM60*1200
70	4.28	DXM70*300	8.56	DXM70*600	17.12	DXM70*1200
75	4	DXM75*300	8	DXM75*600	16	DXM75*1200
160					7.5	DXM160N1200

\*Specify "P" for positive polarity or "N" for negative polarity

**FILAMENT TERMINAL BLOCK — TB1 TWO POSITION TERMINAL BLOCK**

POSITION	SIGNAL	SIGNAL PARAMETERS
1	Filament Output	0-5 amps, 10Vdc Maximum
2	Filament Return	Filament Return

For positive polarity/ground referenced filament units

**DXM ANALOG INTERFACE — J2 15 PIN MALE D CONNECTOR**

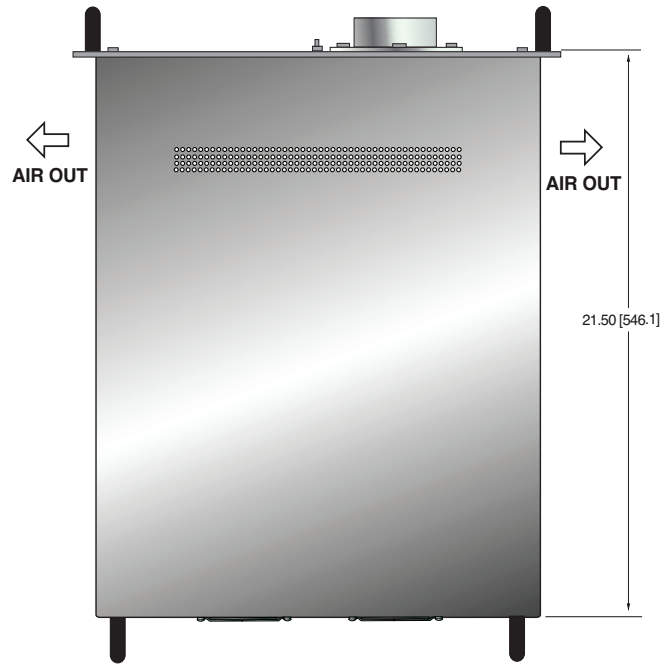
PIN	SIGNAL	SIGNAL PARAMETERS
1	Power Supply Fault	Open Collector, 35V @ 10mA Maximum
2	Current Program In	0 to 10V=0 to 100% Rated Output, Z <sub>in</sub> =10MΩ
3	Voltage Program In	0 to 10V=0 to 100% Rated Output, Z <sub>in</sub> =10MΩ
4	Filament Limit Input	0 to 10V=0 to 100% Rated Output, Z <sub>in</sub> =10MΩ
5	Local Filament Limit	Multi-turn front panel potentiometer
6	Filament Preheat Input	0 to 10V=0 to 100% Rated Output, Z <sub>in</sub> =10MΩ
7	Local Filament Preheat	Multi-turn front panel potentiometer
8	Voltage Monitor	0 to 10V=0 to 100% Rated Output, Z <sub>out</sub> =4.99k, 1%
9	Signal Ground	Ground
10	Current Monitor	0 to 10V=0 to 100% Rated Output, Z <sub>out</sub> =4.99k, 1%
11	X-Ray Enable Input	Connect to Pin 12 to HV Enable Supply
12	X-Ray Enable Output	+15V @ Open, ≤15mA @ Closed
13	Filament Monitor	1 Volt=1 Amp, Z <sub>out</sub> =10kΩ
14	X-Ray On Output Signal	Open Collector, 35V @10mA Maximum
15	Spare	N/C

**RS-232 DIGITAL INTERFACE — J3 9 PIN FEMALE D CONNECTOR**

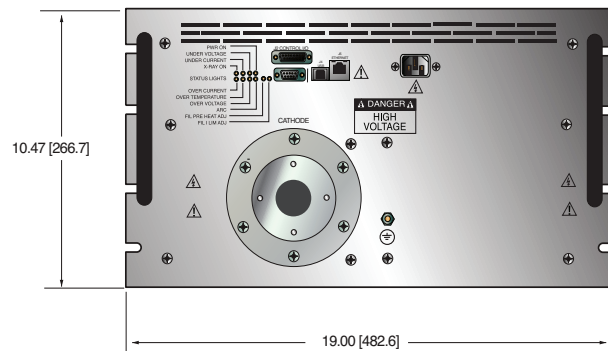
PIN	SIGNAL	SIGNAL PARAMETERS
1	N/C	No Connection
2	TX out	Transmit Data
3	RX in	Receive Data
4	N/C	No Connection
5	SGND	Ground
6	N/C	No Connection
7	N/C	No Connection
8	N/C	No Connection
9	N/C	No Connection

DIMENSIONS: in.[mm]

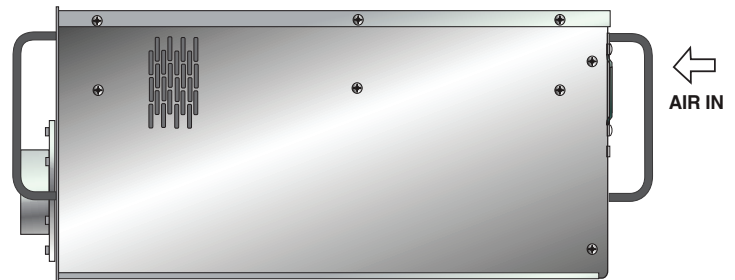
160kV



FRONT VIEW



SIDE VIEW



### USB DIGITAL INTERFACE— J4 4 PIN USB “B” CONNECTOR

PIN	SIGNAL	SIGNAL PARAMETERS
1	VBUS	+5 Vdc
2	D-	Data -
3	D+	Data +
4	GND	Ground

### ETHERNET DIGITAL INTERFACE— J5 8 PIN RJ45 CONNECTOR

PIN	SIGNAL	SIGNAL PARAMETERS
1	TX+	Transmit Data +
2	TX-	Transmit Data -
3	RX+	Receive Data +
4	N/C	No Connection
5	N/C	No Connection
6	RX-	Receive Data -
7	N/C	No Connection
8	N/C	No Connection

### R24 HV CONNECTOR PINOUT J6 CATHODE OUTPUT (160kV)

PIN	OUTPUT CONNECTION
C (common)	High Voltage Output
S (small)	Filament Output
L (large)	Filament Output

### HIGH VOLTAGE OUTPUT CONNECTOR— J6 FLOATING FILAMENT

20kV-75kV Negative Polarity:  
Claymount Mini Federal standard X-Ray connector

160kV Negative Polarity:  
R24 (cable not provided)

### HIGH VOLTAGE OUTPUT CONNECTOR— J6:GROUND FILAMENT

Positive Polarity: Spellman High Voltage  
Delrin Drywell connector.  
4 foot (1.21m) long high voltage  
cable provided

For positive polarity units a ground referenced filament output is provided on a two position terminal TB1. See table

### CLAYMOUNT HV CONNECTOR

PIN	OUTPUT CONNECTION
C (common)	High Voltage Output
S (small)	High Voltage Output
L (large)	Filament Output
G (grid)	Filament Output

Note: No high voltage cable is provided

Recommended Cable: Claymount part number: 12096  
Cable assembly, L3 CA11, CA11, 10F, CS=Bare 10 foot, Mini Federal  
Connectors on both ends, "C" and "S" are both connected to the bare  
shield wire



DIMENSIONS: in.[mm]

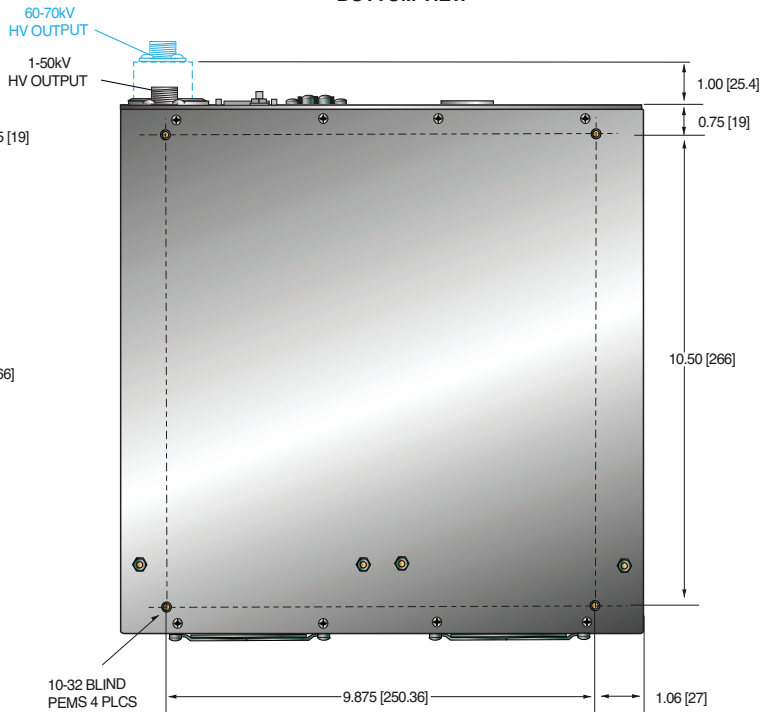
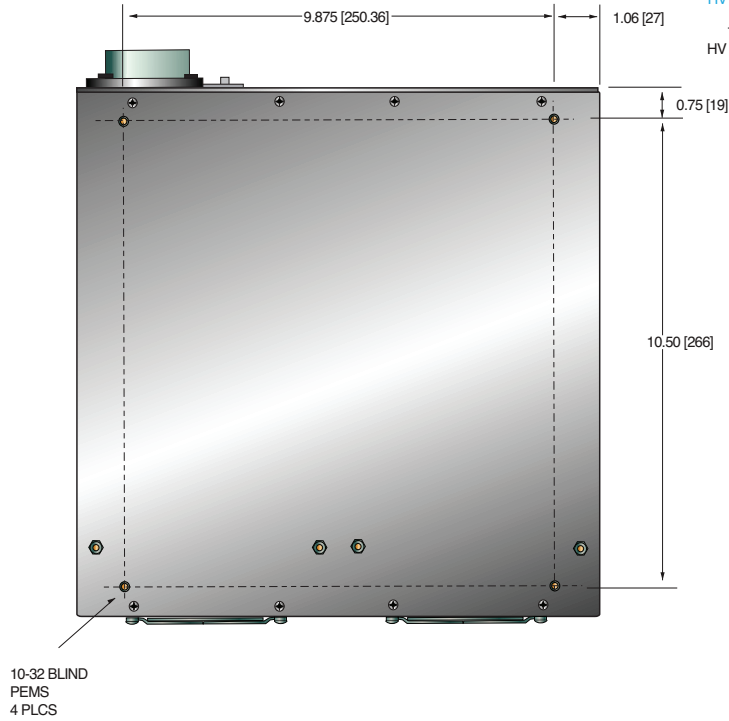
**1200 Watt**

Negative Polarity - Floating Filament

Positive Polarity - Ground Filament

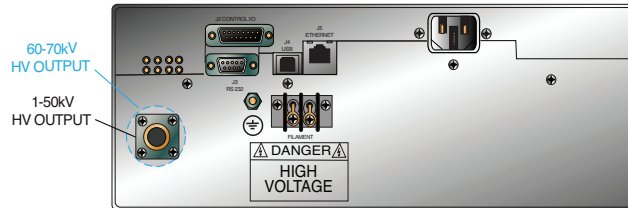
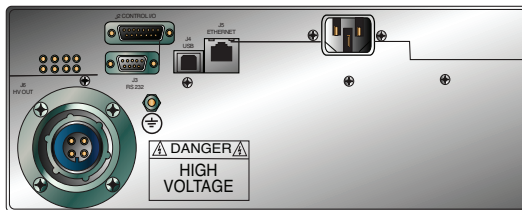
BOTTOM VIEW

BOTTOM VIEW



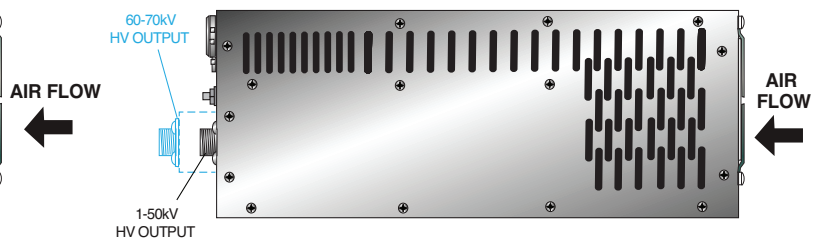
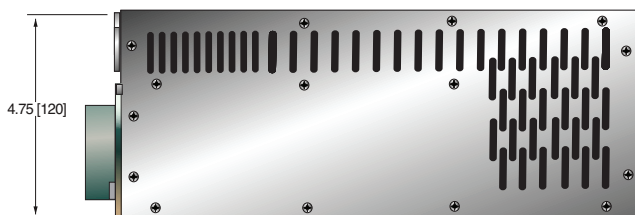
FRONT VIEW

FRONT VIEW



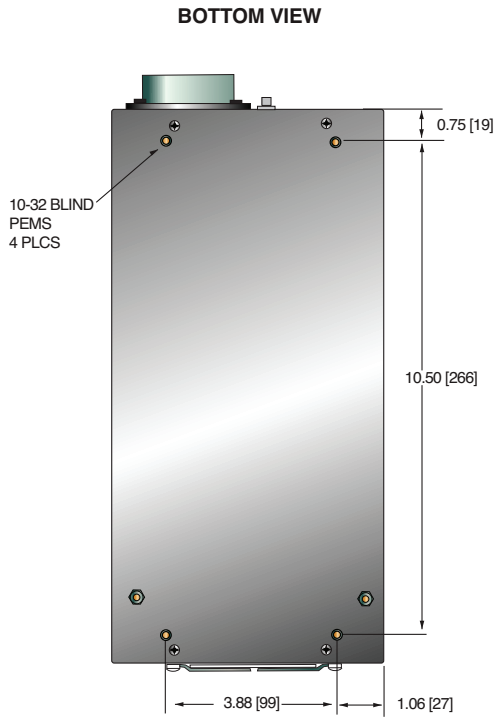
SIDE VIEW

SIDE VIEW

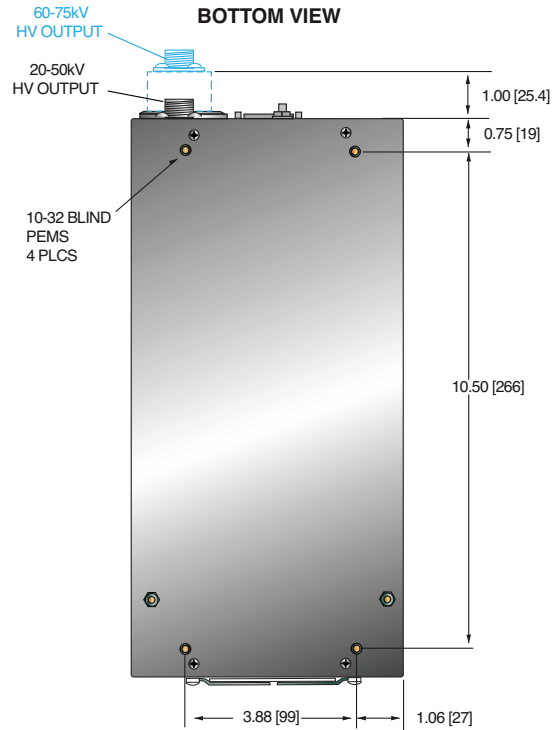


DIMENSIONS: in.[mm]  
**300/600 Watt**

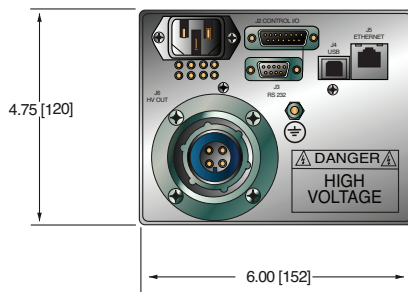
Negative Polarity - Floating Filament



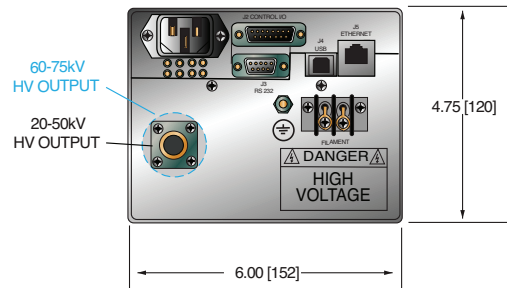
Positive Polarity - Ground Filament



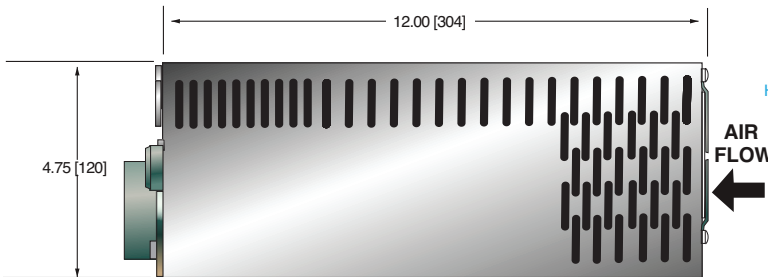
**FRONT VIEW**



**FRONT VIEW**



**SIDE VIEW**



**SIDE VIEW**

