



- **160kV Output Voltage**
- **Rack-Mountable**
- **Floating Filament**
- **Internal Grid Power Supply (80W Model)**
- **Power Factor Correction**
- **Closed-loop Emission Control**
- **OEM Customization Available**

Spellman's XRF Series allow for a wide range of input voltages and supply either 80W, 320W or 640W of output power at up to 160kVdc. These lightweight rack-mountable X-Ray generators house a miniaturized high voltage system in a solid encapsulated, oil-free design. The XRF Series is designed with a power factor corrected input circuit which reduces harmonic emissions and noise normally associated with other high frequency switching power supplies. The XRF Series incorporates an internal floating filament and a closed-loop emission control circuit for precise regulation of emission current. Remote monitoring and control of voltage, current and filament current is also provided.

### TYPICAL APPLICATIONS

X-Ray Inspection, Non-Destructive Testing

### OPTIONS

- |                         |                                      |
|-------------------------|--------------------------------------|
| <b>DF</b> Dual Filament | <b>AT</b> Arc Trip                   |
| <b>GS</b> Grid Supply   | <b>IO</b> Instant ON                 |
| <b>SL</b> Slides        | <b>SS(X)</b> Non Standard Slow Start |

### SPECIFICATIONS

#### Input Voltage:

- 80W: 90-125Vac at 48-62Hz @ 1.9A  
180-264Vac at 48-62Hz @ 0.9A
- 320W: 180-264Vac at 48-62Hz @ 3.5A
- 640W: 180-264Vac at 48-62Hz @ 7A

#### Power Factor:

0.9 or better.

#### High Voltage Supply:

##### Output Voltage:

0-160kV, negative polarity.

##### Output Current:

- 80W: 0.5mA max.
- 320W: 2.0mA at 160kV
- 640W: 4.0mA

##### Output Voltage Stability:

Within 0.1% of set value after warm-up period at full load.

##### Output Voltage Ripple:

- 80W & 320W: <0.1%, or 160V p-p for high freq. and line freq. at full load.
- 640W: 0.03% rms <1kHz, 0.75% rms above 1kHz.

##### Beam Current Stability

- 80W: Within 0.1% of set value after 1/2 hour warm-up at constant output setting of 30-160kV and line voltage of 90-125 & 180-264Vac.
- 320W & 640W: Same as 80W except line voltage of 180-264Vac.

#### Filament Supply:

Constant current DC filament supply with closed-loop current feedback.

#### Filament Voltage:

7V rms (high frequency) max.

#### Filament Current:

5A max., adjustable 0-5.0A by external Filament Limit Programming input.

#### Floating Grid Power Supply:

**Grid Supply:** The grid supply controls tube beam current in a closed-loop regulation design.

**Grid Voltage:** 0 to 1200Vdc.

**Grid Voltage Ripple:** Less than 1.0V rms at any frequency.

**Grid Supply Response:** Less than 0.5mA in less than 10ms.

#### Control and Monitoring:

**Analog Control Inputs:** Three inputs have internal load resistance greater than 330kohms.

#### Voltage Programming:

- 80W, 320W & 640W:  
0 to +10Vdc, where 10.0Vdc = 160kV output.

#### Beam Tube Current Control:

- 80W: 0 to +10Vdc, where 10.0Vdc = 0.5mA tube current.
- 320W: 0 to +10Vdc, where 10.0Vdc = 2.0mA tube current.
- 640W: 0 to +10Vdc, where 10.0Vdc = 4.0mA tube current.

#### Filament Current Control:

- 0 to +10Vdc, where 5.0Vdc = 5.0A filament current.

**Analog Monitor Outputs:** (See tables for details)

**Digital Control Inputs:** (See tables for details)

**Digital Outputs:** (See tables for details)

#### Connections:

##### Output Connector:

R24 (see owners manual for details)

##### Input Power Connector:

5-pin male MS-type, Amphenol P/N 97-3102A-18-20P

##### Control Connector:

25-pin "D" connector, male, chassis-mounted.

#### Environmental:

0 to +50°C at 10-95% RH, non-condensing.  
Forced convection cooling.

#### Dimensions:

7"H x 19"W x 22"D (17.8cm x 48.3cm x 55.9cm).

#### Regulatory Approvals:

Compliant to EEC EMC Directive. Compliant to EEC Low Voltage Directive. RoHS Compliant.

#### Electronic Component (Power Source)

**XRF series is intended for installation as a component of a system.**

It is designed to meet CE standards, with conditions of acceptance often being: customer provided enclosure mounting, EMC filtering, and appropriate protection, and isolation devices. The XRF series is not intended to be operated by end users as a stand-alone device. The XRF series power supply can only be fully assessed when installed within a system, and as a component part within that system.

## 160kV XRF SELECTION TABLE

OUTPUT VOLTAGE kV	OUTPUT CURRENT mA	OUTPUT POWER W	MODEL NUMBER XRFxxx
160	0.5	80	XRF160N80
160	2.0	320	XRF160N320
160	4.0	640	XRF160N640

## J2 AC INPUT CONNECTOR WIRING

5 Pin MS Type	7 Pin UTG Type	CONNECTION
A	1	Auxiliary (Logic) Line
B	2	Auxiliary (Logic) Neutral
C	3	Ground
D	4	Main (Inverter) Line
E	5	Main (Inverter) Neutral

## JB1 160kV XRF 80W, 320W, 640W 25 PIN

PIN	SIGNAL	SIGNAL PARAMETERS
1	Filament Limit	0-5V = 0-5A Filament Limit
2	High Voltage on Control	+12VDC IN = HV ON
3	N/C	
4	N/C	
5	High Voltage On Status	Low = HV ON
6	A-Ground	Ground
7	kV Monitor	0-10V = 0-160kV
8	Interlock Control	+12VDC IN = Interlock Closed
9	N/C	
10	mA Demand	0-10V = 0-100% Rated Output
11	N/C	
12	N/C	
13	D-Ground	Ground
14	Fil. Monitor	0-5V = 0-5A
15	N/C	
16	N/C	
17	N/C	
18	N/C	
19	mA Monitor	0-10V = 0-100% Rated Output
20	N/C	
21	+12VDC Out	
22	kV Demand	0-10V = 0-160kV
23	Grid Inhibit/Fil. Select	Low = Grid Inhibit
24	N/C	
25	Chassis Gnd (I/O Shield)	Chassis Gnd.

## 160kV XRF 80W, 320W, 640W TERMINAL BLOCK 10 PIN

PIN	SIGNAL	SIGNAL PARAMETERS
1	Interlock	Jumper to TB1-2 to close interlock
2	Interlock Return	
3	kV Monitor	0-10V=0-160kV
4	mA Monitor	0-10V = 0-100% Rated Output
5	Filament Monitor	0-5V=0-5A
6	N/C	
7	HV ON Indicator	+15V = HV ON
8	Voltage Mode Indicator	Low = Voltage Mode.
9	Current Mode Indicator	Low = Current Mode.
10	GND	Ground

DIMENSIONS: in.[mm]

