

Spellman's XRB011 Series of Monoblock® X-Ray sources are designed for OEM applications powering its internal X-Ray tube up to 80kV at 20W and 80kV at 50W. Features like 24Vdc input voltage, small package size, standard analog interface and RS-232/Ethernet digital interface simplify integrating the XRB011 into your X-Ray system. Proprietary emission control circuitry provides excellent regulation of X-Ray tube current, along with outstanding stability and performance.

TYPICAL APPLICATIONS

Medical X-Ray: Fluoroscopy and Radiography for Extremities, Specimen Radiography.
Pulsed Fluoroscopy (contact Spellman sales)
Industrial X-Ray: Component inspection and Non-Destructive Testing

SPECIFICATIONS

X-Ray Characteristics:

Tube Type: Micro focus tube
Focal Spot: 33 μ m Nominal, 50 μ m max. (IEC 336)
Beam Filter: Ultem 0.060" (1.5mm)
Oil 0.175" (4.4mm)
Beam Geometry: Symmetrical 40° cone

Input Voltage:

20W: 24Vdc \pm 1V @ 2.5A
50W: 24Vdc \pm 1V @ 4A

X-Ray Tube Voltage:

Nominal X-Ray tube voltage is adjustable between 35kV to 80kV

X-Ray Tube Current:

20W: 0-250 μ A over specified tube voltage range
50W: 0-700 μ A over specified tube voltage range

X-Ray Tube Power:

20/50W maximum continuous

Voltage Regulation:

Line: \pm 0.5% for a \pm 1V change of nominal input line voltage
Load: \pm 0.1% for a load change of 25 μ A to maximum rated current

- **Integrated HV Supply, Filament Supply, X-Ray Tube, Beam Port and Control Electronics**
- **Compact & Lightweight**
- **Can be Mounted in Any Physical Orientation**
- **Analog or Digital Control Interface**

www.spellmanhv.com/manuals/XRB011

Voltage Accuracy:

Voltage measured across the X-Ray tube is within \pm 1% of the programmed value

Voltage Risetime:

Ramp time shall be \leq 250ms from 10% to 90% of maximum rated output voltage

Voltage Temperature Coefficient:

\leq 100ppm/°C

Over Temperature Fault:

Indicates that the internal oil temperature has exceeded 65° C. The high voltage output will be disabled. Toggling the X-Ray ON Command OFF and ON will reset the fault.

Over Voltage Fault:

An overvoltage (OV) fault is detected when the output voltage exceeds 82kV. The high voltage output will be disabled. Toggling the X-Ray ON Command OFF and ON will reset the fault.

Voltage Ripple:

1% peak to peak

Current Regulation:

Line: \pm 0.5% for a \pm 1V change of nominal input line voltage
Load: \pm 0.5% for a voltage change of 35kV to 80kV

Current Accuracy:

Current measured through the X-Ray tube is within \pm 2.5% of the programmed value

Over Current Fault:

An overcurrent (OC) fault is detected when the emission current exceeds 275 μ A (20W model) and 710 μ A (50W model). Toggling the X-Ray ON Command OFF and ON will reset the fault.

Arc Intervention:

One arc fault. The high voltage output will be disabled. Toggling the X-Ray ON command OFF and ON will reset the fault.

Filament Configuration:

Internal high frequency AC filament drive with closed loop filament emission control

Analog Interface:

Ground referenced 10kV/V, 25 μ A/V (20W model) and 70 μ A/V (50W model) for programming and monitoring analog interface signals. Open collector, active low digital signal interface. Internal jumper is needed to be configured for analog interface.

Digital Interface:

RS-232: standard
Ethernet: optional

Control Software:

A demo GUI is available for engineering evaluations

Interlock/Signals:

A hardware interlock functions in both analog and digital programming modes.

Operating Temperature:

0°C to +40°C

Storage Temperature:

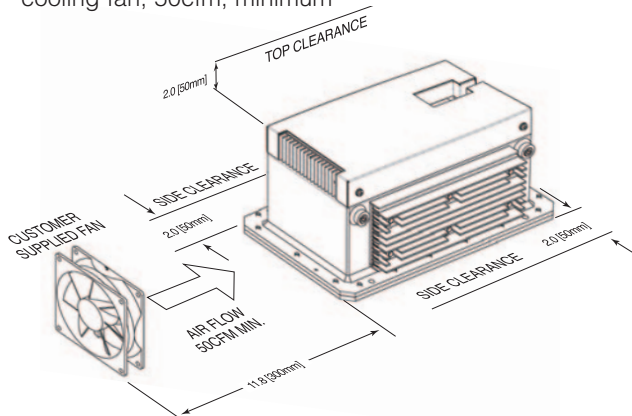
-20°C to +70°C

Humidity:

10% to 95% relative humidity, non-condensing

Cooling:

20W and 50W option: Customer provided, external cooling fan, 50cfm, minimum



Analog Interface and Input Line Connector:

25 pin D connector, male

Digital Interface Connector:

RS-232: 9 pin D connector, female
Ethernet: RJ45 connector

Grounding Point:

6-32 ground stud provided on chassis

Dimensions:

20W: 5.81"W x 5.0"H x 10.81"D
(147.57mm X 127mm X 274.57mm)
50W: 6.00"W x 5.0"H x 10.81"D
(152.4mm x 127mm x 274.57mm)

Weight:

20W: 18lbs (8.165kg)
50W: 20lbs (9.072kg)

Orientation:

Can be mounted in any orientation.

X-Ray Leakage:

Less than 1mR/hr at 1 meter

Regulatory Approvals:

Compliant to UL/CUL recognized file E242584.
CE to EN 61010-1 for non-medical applications.

RS-232 DIGITAL INTERFACE – J5 9 PIN FEMALE D CONNECTOR

PIN	SIGNAL	PARAMETERS
1	NC	No Connection
2	TX Out	Transmit Data
3	RX In	Receive Data
4	NC	No Connection
5	SGND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

ETHERNET DIGITAL INTERFACE – RJ45 8 PIN CONNECTOR

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

ANALOG INTERFACE – J1 25 PIN MALE D CONNECTOR

PIN	SIGNAL	PARAMETERS
1	+24V	+24Vdc±1Vdc @ 4A
2	+24V	+24Vdc±1Vdc @ 4A
3	+24V	+24Vdc±1Vdc @ 4A
4	NC	No Connection
5	+24V RETURN	+24V RETURN
6	+24V RETURN	+24V RETURN
7	+24V RETURN	+24V RETURN
8	Signal Ground	Signal Ground
9	Interlock Input	Input, Active low, Interlock is low safe to enable high voltage. Connect to +24V Return
10	kV Monitor	Output, 0 to 8V = 0 to rated output voltage. Zout=100Ω
11	µA Monitor	Output, 0 to 10V = 0 to rated output current. Zout=100Ω
12	X-Ray Ready status	Output, Active Low, Open Collector, 24Vdc @ 10mA max
13	X-Ray ON status	Output, Active Low, Open Collector, 24Vdc @ 10mA max
14	Filament Standby status	Output, Active Low, Open Collector, 24Vdc @ 10mA max
15	Over Voltage Fault	Output, Active Low, Open Collector, 24Vdc @ 10mA max
16	Over Current Fault	Output, Active Low, Open Collector, 24Vdc @ 10mA max
17	ARC Fault	Output, Active Low, Open Collector, 24Vdc @ 10mA max
18	Filament Current Limit Fault	Output, Active Low, Open Collector, 24Vdc @ 10mA max
19	Signal Ground	Signal Ground
20	Interlock Output	Output, Active Low, Open Collector, 24Vdc @ 10mA max
21	µA Program	Input, 0 to 10V = 0 to rated output current. Zin=10kΩ
22	kV Program	Input, 0 to 8V = 0 to rated output voltage. Zin=10kΩ
23	X-Ray ON Command	Input, Active low Low (short) = X-Ray ON High (open) = X-Ray OFF Internal pull up resistor to +15V
24	Signal Ground	Signal Ground
25	Over Temperature	Output, Active Low, Open Collector, 24Vdc @ 10mA max

20W Model
ORDERING INFORMATION

Medical Applications:

- XRB011-80PN20 80kV, 250uA, 20W, Analog Interface, RS-232
- XRB011-80PN20E 80kV, 250uA, 20W, Analog Interface, RS-232, Ethernet
- XRB011-80PN20A 80kV, 250uA, 20W, Analog Interface

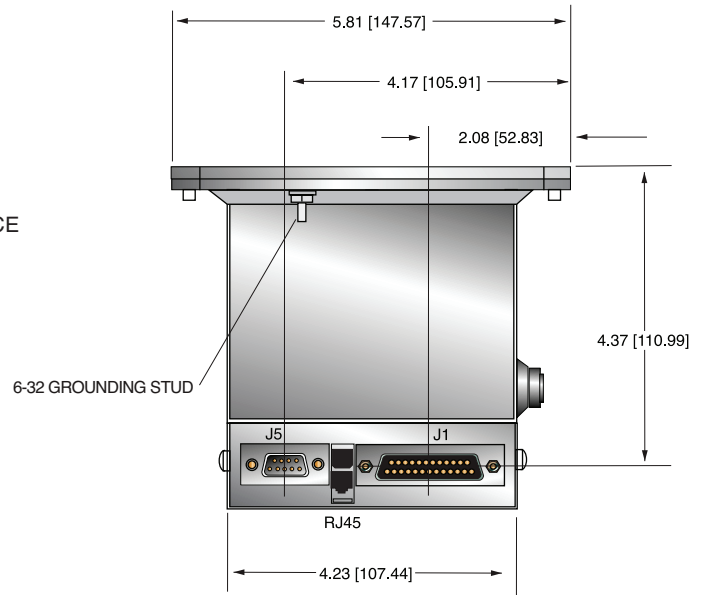
Non-Medical Applications:

- XRB011-80PN20/CE 80kV, 250uA, 20W, Analog Interface, RS-232, CE
- XRB011-80PN20E/CE 80kV, 250uA, 20W, Analog Interface, RS-232, Ethernet, CE
- XRB011-80PN20A/CE 80kV, 250uA, 20W, Analog Interface, CE

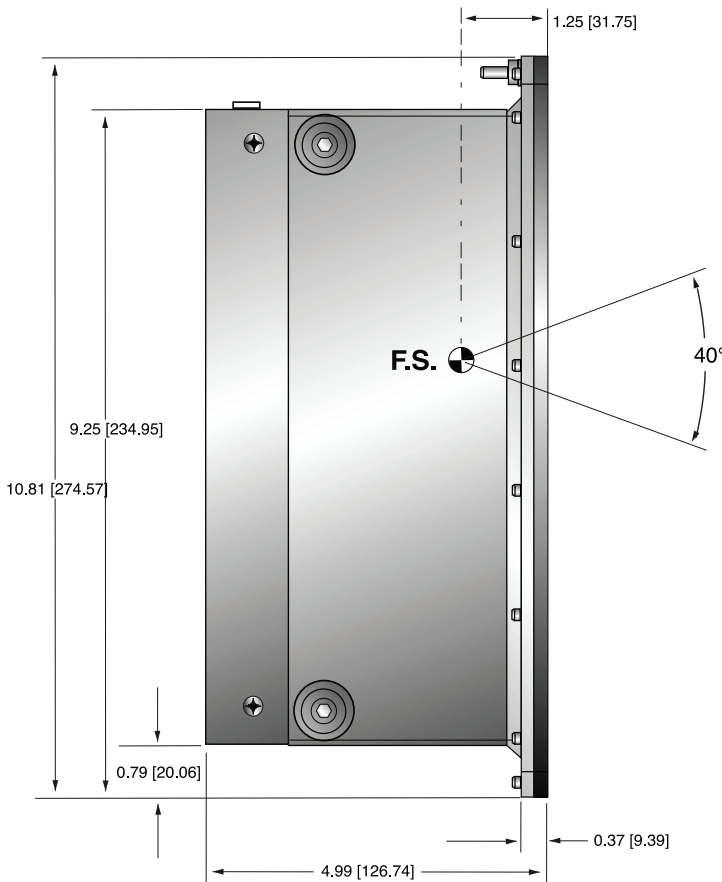
XRB011
20W Model

DIMENSIONS: in.[mm]

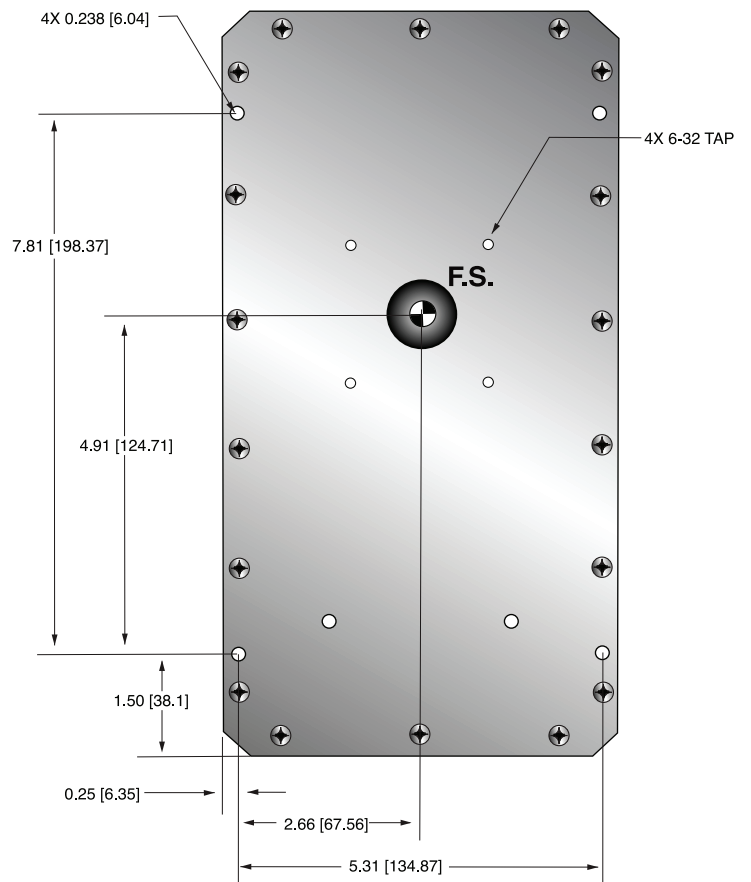
FRONT VIEW



SIDE VIEW



TOP VIEW



50W Model ORDERING INFORMATION

Medical Applications:

XRB011-80PN50	80kV, 700uA, 50W, Analog Interface, RS-232
XRB011-80PN50E	80kV, 700uA, 50W, Analog Interface, RS-232, Ethernet
XRB011-80PN50A	80kV, 700uA, 50W, Analog Interface

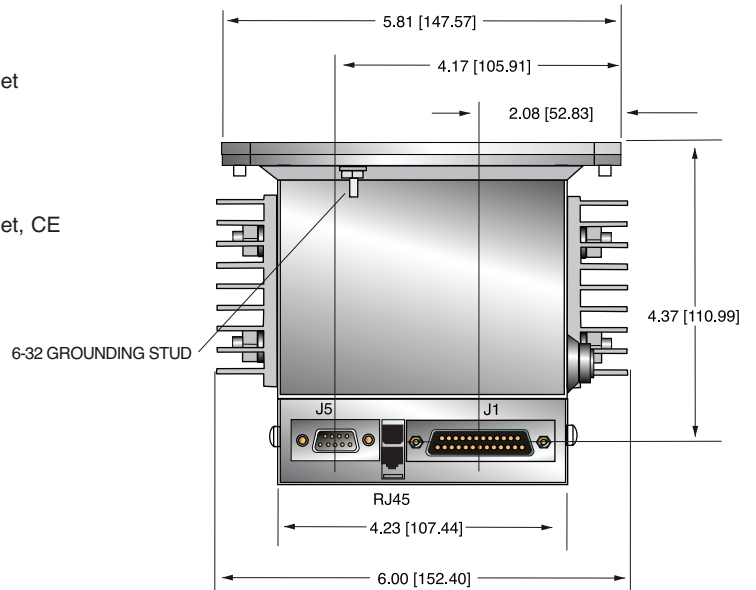
Non-Medical Applications:

XRB011-80PN50/CE	80kV, 700uA, 50W, Analog Interface, RS-232, CE
XRB011-80PN50E/CE	80kV, 700uA, 50W, Analog Interface, RS-232, Ethernet, CE
XRB011-80PN50A/CE	80kV, 700uA, 50W, Analog Interface, CE

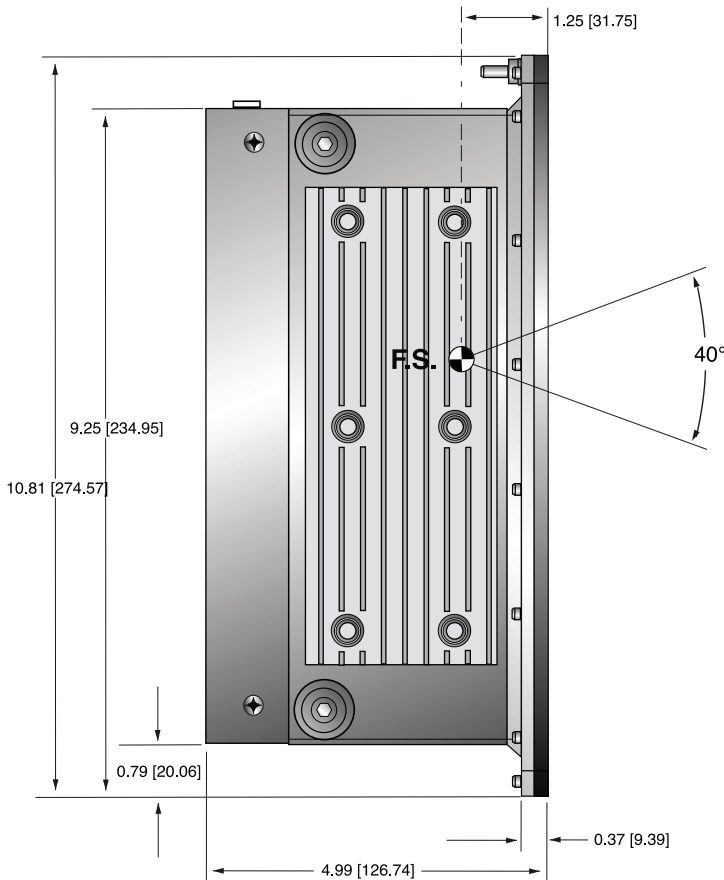
XRB011 50W Model

DIMENSIONS: in.[mm]

FRONT VIEW



SIDE VIEW



TOP VIEW

