

Spellman's XRB502 Series of Monoblock® X-Ray sources are designed for OEM applications powering its internal X-Ray tube up to 160kV at 500W. Features like universal input, small package size and a standard analog and RS-232 digital interface simplify integrating the XRB502 into your X-Ray system. Standard models are available either with fan shaped or cone shaped beam geometries. Proprietary emission control circuitry provides excellent regulation of X-Ray tube current, along with outstanding stability performance.

TYPICAL APPLICATIONS

X-Ray Scanning: Food Inspection, Fill Level Confirmation and Security Applications

SPECIFICATIONS

X-Ray Characteristics:

Tube Type: Glass tube, Tungsten target, Be filter
Focal Spot: 0.8mm x 0.8mm, 0.5mm x 0.5mm
Beam Filter: 0.016" thick 6061 Al, ±0.0045"
0.125" Ultem
Beam Geometry: Asymmetrical fan up to 80° x 30°, cone up to 40°

Input Voltage:

90-264Vac, 50/60Hz, 6.5A max; 12Vdc @ 5A

X-Ray Tube Voltage:

Nominal X-Ray tube voltage is adjustable between 80kV to 160kV

X-Ray Tube Current:

0.25mA to 6mA over specified tube voltage range

X-Ray Tube Power:

500W, maximum

Voltage Regulation:

Line: ±0.1% for a ±10% input line change of nominal input line voltage
Load: ±0.1% for a 0.3mA to 6mA load change

Voltage Accuracy:

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

Voltage Risetime:

Ramp time shall be <1 second from 10% to 90% of rated output

- **Integrated HV Supply, Filament Supply, X-Ray Tube, Beam Port and Control Electronics**
- **Compact & Lightweight**
- **Universal Input, Power Factor Corrected**
- **Can be Mounted in Any Physical Orientation**
- **Analog Control Interface and Standard RS-232 Digital Interface**

Voltage Overshoot:

Within 5% of rated voltage in <10ms

Voltage Ripple:

0.1% pp of rated voltage @ ≤1kHz

Current Regulation:

Line: ±0.1% for a ±10% input line change of nominal input line voltage
Load: ±0.5% @ 75-160kV, 0.3mA to 6mA

Current Accuracy:

Current measured through the X-Ray tube is within ±2% of the programmed value

Current Risetime:

<1 second from 10% to 90% of rated output

Arc Intervention:

4 arcs in 10 seconds with a 200ms quench = Shutdown

Filament Configuration:

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

Analog Interface:

0 to 10Vdc ground referenced signals

Digital Interface:

RS-232 interface.

Control Software:

A demo GUI for engineering evaluations will be provided for the RS-232 digital interface upon request.

Interlock Signals:

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

Operating Temperature:

0°C to +40°C

Storage Temperature:

-40°C to +70°C

Humidity:

10% to 95% relative humidity, non-condensing

Cooling:

Heat exchanger w/fan and oil pump, powered from DC

Input Line Connector:

3 pin, Phoenix Contact 1829167

Analog Interface Connector:

10 pin, Phoenix Contact 1755503

Digital Interface Connector:

9 pin D connector, female

Grounding Point:

8-32 ground stud provided on chassis

Dimensions:

See outline drawing

Weight:

125lbs (56.7kg)

Orientation:

Can be mounted in any orientation.

X-Ray Leakage:

Not to be greater than 0.5mR/hr at 5cm outside the external surface per FDA 21 CFR 1020.40 and OSHA 29 CFR 1020.96

Special Features/Requirements:

55dB SPL @ 1m with fans stopped on heat exchanger High stability X-Ray output: Dose rate variations <1%

**AC INPUT POWER
J1 3 PIN CONNECTOR**

PIN	SIGNAL	PARAMETERS
1	Line	100-264Vac
2	Ground	Ground
3	Neutral	Neutral

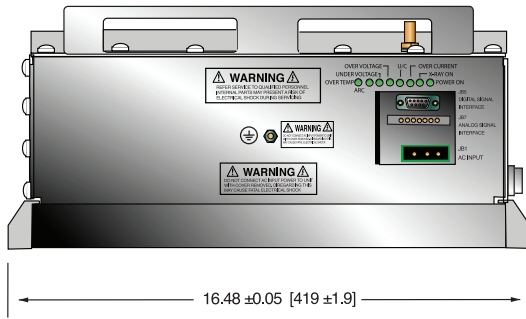
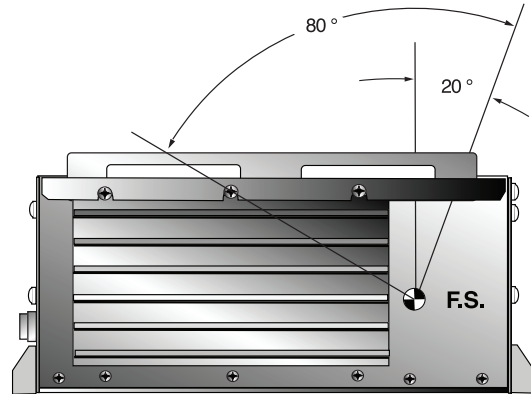
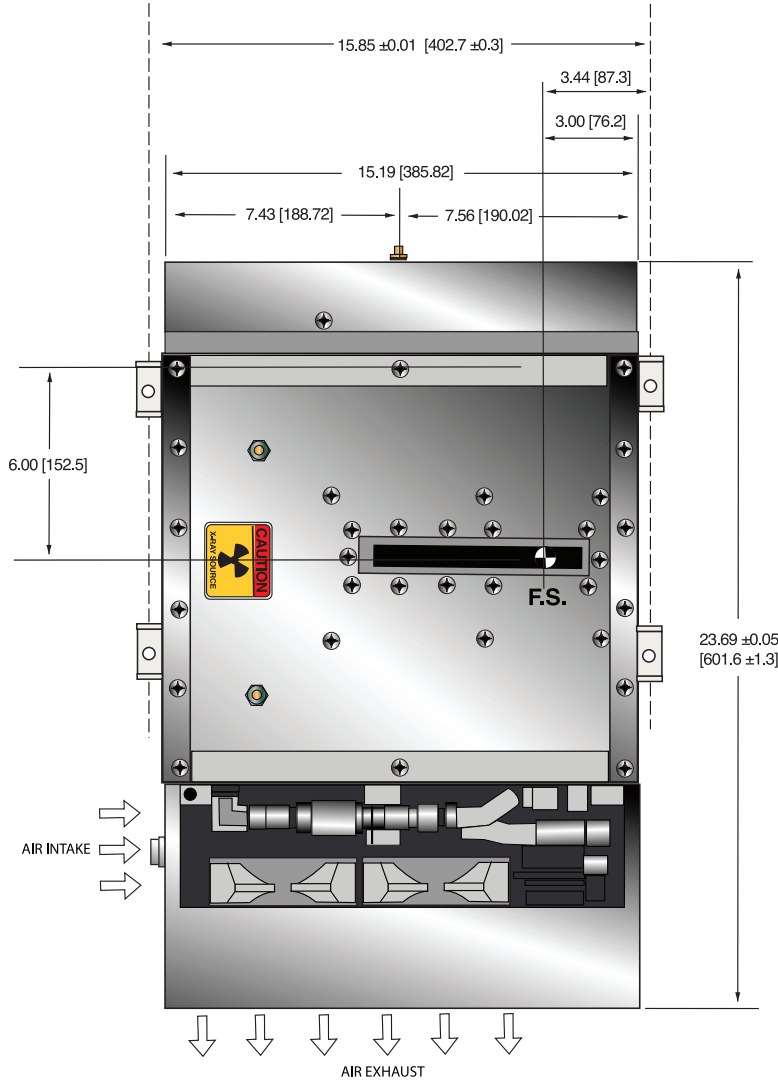
**ANALOG INTERFACE—
JB15 10 PIN PHOENIX CONTACT**

PIN	SIGNAL	PARAMETERS
1	X-Ray Signal	+24Vdc =Enable X-Ray, 0Vdc/open = Disable X-Ray, Z _{in} =2.2kΩ
2	X-Ray Signal Return	Signal Return
3	N/C	N/C
4	kV Monitor	0-10Vdc = 0 to 178kV, Z _{out} = 10kΩ
5	Signal Ground	Signal Ground
6	mA Monitor	0-10Vdc = 0 to 3.4mA, Z _{out} = 10kΩ
7	Fault Signal	Open collector, High (Open) = No Fault, 35Vdc @10mA maximum
8	HV ON Lamp Relay n/o	Relay Normally Open, 50Vdc @ 1A maximum
9	HV ON Lamp Relay common	Relay Common, 50Vdc @ 1A maximum
10	HV ON Lamp Relay n/c	Relay Normally Closed ,50Vdc @ 1A maximum

LED INDICATORS

INDICATOR	SIGNAL NAME	CONDITION Illuminated When...
LED 1	OT	Over temperature occurs
LED 2	ARC FLT	Arc fault occurs
LED 3	UV	Low kV occurs
LED 4	OV	High kV occurs
LED 5	UC	Low mA occurs
LED 6	OC	High mA occurs
LED 7	X-RAY ON	X-Rays are enabled
LED 8	PWR	Power is ON

DIMENSIONS: in.[mm]

FRONT VIEW**BACK VIEW****TOP VIEW****SIDE VIEW**