Advanced Energy

HITEK POWER XR1000

1 KW X-RAY POWER SUPPLY MODULE

Component power supply for industrial x-ray systems, elemental analysis equipment, x-ray diffraction spectrometers, and materials process monitoring applications

The XR1000 series is a component power supply for industrial x-ray systems, elemental analysis equipment, x-ray diffraction spectrometers, and materials process monitoring applications. It incorporates a floating filament supply that is automatically controlled by the integral beam loop. It is based on the proven HiTek Power IGBT converter, ensuring high efficiency and reliable operation. The XR1000 units are available with either an analog or RS-232 control interface.

FEATURES

- 1 KW OF OUTPUT POWER
- EXTENSIVE TUBE PROTECTION FACILITIES
- ROBUST IGBT CONVERTER DESIGN
- SHORT-CIRCUIT AND OVERLOAD PROTECTION
- HIGH STABILITY
- HIGH-ACCURACY BEAM CURRENT CONTROL
- LOW RIPPLE
- ANALOG OR RS-232 INTERFACE
- CE MARKED FOR EU LV DIRECTIVE 2006/95/EC

Typical Applications:

- **X-Ray Fluorescence (XRF)**
- **X-Ray Diffraction (XRD)**
- **X-Ray Reflectivity (XRR)**
- **X-Ray Imaging (XRI)**

Note: *Please contact AE for information about custom versions for specific requirements.*

SPECIFICATION	
Output Power	1 kW, max, at full rated output voltage and current
Output Voltage	0 to -60 kV or 0 to -90 kV
Output Current	60 kV unit: 0 to 16 mA
	90 kV unit: 0 to 11 mA
Input Voltage	230 VAC ±10% (207 to 253 VAC) 47 to 63 Hz, single phase and earth
Input Current	Not exceeding $12A_{RMS}$
Polarity	Negative
Specification Range	Specifications apply above 5% of rated output voltage and current
Ripple	< 0.25% of setting plus 0.25% of rating, peak to peak
Arc Count and Extinguish (ACE)	Each time the ACE system detects an arc, it blanks the supply off for a brief period to extinguish the arc. The unit is then allowed to recover. If more arcs occur, they are counted to determine the arc rate; if this exceeds a safe level, the power supply is shut down. The parameters are factory set.
Metering	Provided as part of an alphanumeric display; Voltages are displayed with a resolution better than 0.5% of rated output. Current is displayed with a resolution of better than 1.5% of rated output
Status Indication	The alphanumeric display shows the status of the interlock and the reason for any trip condition.
Voltage Regulation	
Line	< 0.05% change in output voltage for a 10% change in line voltage
Static Load	< 0.05% change in output voltage for a 5 to 100% change in output current
Dynamic Load	< 5% change in output voltage for a 5 to 100% change in output current, recovery to within 1% of previous setting within 200 msec
Beam Current Regulation	
Line	< 0.05% change in output current for a 10% change in line voltage
Load	< 0.05% change in output current for a 60% change in rated output voltage
Stability and Drift	
Temperature Coefficient	< 100 ppm/°C
Drift	< 0.1% of rating over an eight-hour period after 30 min warmup
Filament Specification	
Voltage	8 VDC, max, referenced to the negative output voltage
Current	0.5 to 5 ADC
Environmental	
Operating Temperature	0 to +40°C (50 to 104°F)
Storage Temperature	-20 to +70°C (-4 to 158°F)
Humidity	80% max relative humidity up to 31°C (88°F), reducing linearly to 50% at 40°C (104°F); non-condensing (ref BS EN61010-1)
Altitude	Sea level to 2000 m (6500')
Cooling	Fan assisted with fan fail detection. Air inlets at the sides of the unit with exhaust on the rear panel. Minimum air flow required is 3 m/sec at the air intake on the side panels.
Usage	Indoor use only
Installation Category	II (BS EN61010)
Pollution Degree	2 (BS EN61010)
Portability	Non-portable
Safety, Protection, and Compliance	
EMC	This power supply is intended for installation as part of a system. Basic EMC filtering is provided.
RoHS	The XR1000 is currently built to non-RoHS standard. This unit can, however, be configured to meet the requirements of RoHS where significant customer demand requires it, although please note that this will have an impact on delivery timescales.
Protection	Over-temperature
	Over-voltage
	Fan failure detection
	Filament current limit
	Series output resistance

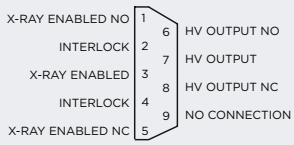
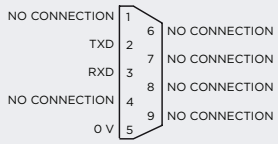
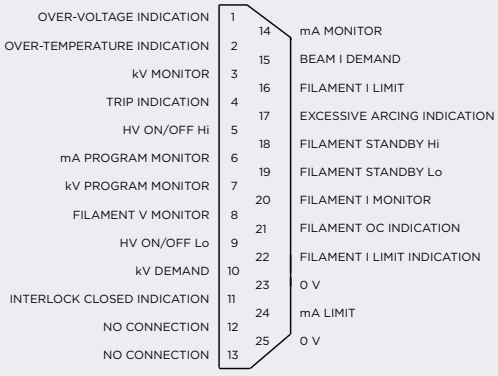
SPECIFICATION

Safety	Meets the requirements of the Low Voltage Directive (LVD), 2006/95/EC, by complying with BS EN61010-1 when installed as a component part of other equipment and is CE marked accordingly
Safety Class	Equipment class 1
Mechanical	
Dimensions	See outline drawing on page 6.
Weight	33 kg (73 lb)

OUTPUT AND ORDERING INFORMATION

Model	Output Voltage	Output Current
XR1000/603	-60 kV	-16 mA
XR1000/903	-90 kV	-11 mA

INTERFACE CONNECTIONS

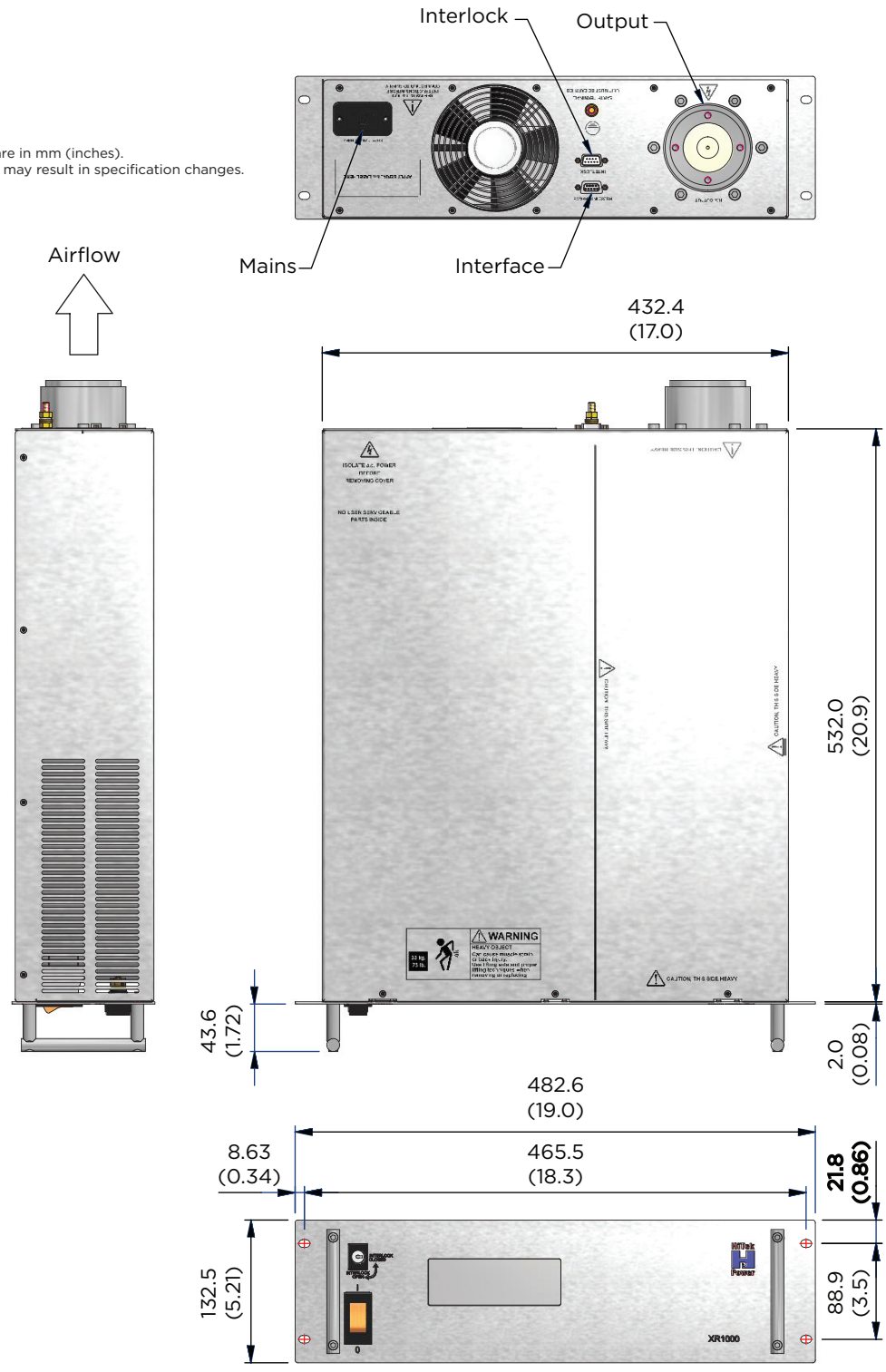
Mains	IEC320-C20 16 A
Safety Earth	M5 stud
HV Output	R10, 100 kV receptacle on rear of unit (cable available separately)
	Terminal C: HV output
	Terminal L: Filament
	Terminal S: No connection
Remote Interlock 9-Way, male, D-Type Connector	
	X-ray enabled and HV output are both a set of isolated changeover contacts. Interlock is an input; shorting the pins closes the interlock.
Digital Remote Control 9-Way, Female, D-Type Connector	
	RS-232 Interface 9600 Baud, 8 bit, 1 start, 1 stop, no parity
Analog Remote Control 25-Way, Female, D-Type connector	

CE These component power supplies meet the requirements of EC Directive 2006/95/EC (LVD).

NOTES:

- *All logical indicators are open collector outputs rated at 16 V (max) in the off state. An internal 100 Ω resistor is connected in series with the open collector transistor. The pull down voltage is 0.9 V plus the internal resistor drop. The rated current is 10 mA.*
- *All analog voltage and current monitors are 0 V to +10 V ±0.5% ±20 mV, with respect to 0 V, representing 0 to rated output. Signal impedance is less than 100 Ω and minimum external load resistance is 2 kΩ.*
- *All analog voltage and current inputs are 0 to +10 V with respect 0 V, representing 0 V to rated output ±0.2% of setting ±0.1% of rating. Input impedance is greater than 50 kΩ.*

Drawing dimensions are in mm (inches).
Design developments may result in specification changes.



AE World Headquarters
1625 Sharp Point Drive
Fort Collins, Colorado 80525

1 800 446 9167
+1 970 221 4670

sales.support@aei.com
advanced-energy.com

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