


## 2KW X-RAY GENERATOR POWER SUPPLIES

### XR2000



#### FEATURES

- 2kW of output power
- Extensive tube protection facilities
- Robust IGBT converter design
- High stability
- Low ripple
- High accuracy filament control
- RS232 Interface option
-  Marked

#### APPLICATIONS

- Elemental analysis equipment.
- X-Ray diffraction spectrometers.
- Materials process monitoring.
- Industrial X-Ray equipment.

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#### DESCRIPTION

This XR2000 is intended as a component power supply for use in industrial and analytical X-Ray systems and low energy industrial radiography applications. The XR2000 features HiTek Power's proven IGBT converter design. Tube arc suppression and Interlocks are standard.

#### SPECIFICATION

<b>Rated Supply Voltage:</b>	230V AC $\pm$ 10% (207V AC – 253V AC) 47-63Hz single phase and earth
<b>Supply Current:</b>	16A rms
<b>Mains Connector:</b>	Harting Han 6E, mating half supplied.
<b>Efficiency:</b>	Greater than 80% at full output power
<b>Output Voltage:</b>	0 to 90kV or 0 to 60kV Specifications apply from 10% to 100% of rated voltage.
<b>Polarity:</b>	Negative
<b>Output Current:</b>	90kV unit, 0 to 22mA at 90kV increasing to 33mA maximum at 60kV. Constant power between 60kV and 90kV. 60kV unit, 0 to 33mA at 60kV increasing to 44mA maximum at 45kV. Constant power between 45kV and 60kV. Specifications apply from 5% to 100% of maximum current
<b>Line Regulation:</b>	0.05% of rated output voltage for $\pm$ 10% variation in supply voltage.
<b>Load Regulation:</b>	0.1% of rated output voltage for a load current change of 5% to 100%.
<b>Tube current line regulation:</b>	0.05% of rated output current for $\pm$ 10% variation in supply voltage.
<b>Tube current load regulation:</b>	0.05% of rated output current for a 60% of rated output voltage change.
<b>Ripple:</b>	Less than 0.25% of setting plus 0.25% of rating, peak to peak.
<b>Temperature Coefficient:</b>	Less than 100ppm/ $^{\circ}$ C
<b>Protection:</b>	Over temperature trip, Output over voltage trip, Arc trip
<b>Floating filament supply</b>	
<b>Voltage:</b>	12V DC maximum. Referenced to the negative output voltage.
<b>Current:</b>	0 to 5.0A DC
<b>Protection:</b>	Current limit set through interface or front panel control.
<b>Dual Filament:</b>	Optional selectable output connection
<b>Operating Temperature:</b>	0 $^{\circ}$ C to + 40 $^{\circ}$ C
<b>Storage Temperature:</b>	-20 $^{\circ}$ C to +70 $^{\circ}$ C
<b>Humidity:</b>	85% maximum relative humidity. Non condensing.
<b>Altitude:</b>	Sea level to 2000 metres (6500 feet).
<b>Usage:</b>	Indoor use only.
<b>Installation Category:</b>	II
<b>Pollution Degree:</b>	2
<b>E.M.C:</b>	Intended for installation as part of a system. Basic EMC filtering is provided.
<b>Safety:</b>	Meets the requirements of the Low Voltage Directive, LVD, 73/23/EEC by complying with EN61010-1:1993 when installed as a component part of other equipment. It is CE marked accordingly.
<b>Class:</b>	Equipment Class 1.
<b>Mechanical Specification:</b>	
<b>Dimensions:</b>	See outline drawing.
<b>Construction:</b>	All external metalwork is stainless steel
<b>Weight:</b>	42kg (92lb)
<b>Cooling:</b>	Forced air cooling.
<b>Mounting:</b>	Designed for mounting in a standard 19" rack system. Any orientation.

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#### Front Panel Facilities

<b>Main circuit breaker:</b>	Circuit breaker isolates power to all circuits within the generator.
<b>Metering:</b>	Two front panel meters are provided as part of an alphanumeric display utilising 10mm high characters. These provide monitoring of beam voltage and current. The beam voltage meter reads 00.0 to 90.0kV or 00.0 to 60.0kV and the beam current meter reads 00.0 to 33mA or 00.0 to 44mA.
<b>Status Indication:</b>	<p>Provided as part of the alphanumeric display. X-Ray ON/OFF (HVON/OFF) and Interlock Status are continuously displayed.</p> <p>If a trip occurs the kV and mA information is overwritten with 'Generator Trip' followed by the cause of the trip which may be one of:-            Over Voltage            Over Temperature            Arc            Internal Overload</p>
<b>Controls:</b>	Optional front panel controls for: KV mA Filament current limit Power limit Remote/Local selection
<b>Output connection:</b>	R24, 100kV receptacle on rear of unit. (Cable available separately). Optional Federal Standard 75kV or Mini75 for the 60V version.

#### User Interface

There are two options for the user interface, an analogue interface via a 25 way D-Type connector or an RS232 via either a 9 way D-type or twin fibre optics.

#### Analogue Option

<b>Function:</b>	Description
<b>KV Program:</b>	Differential input, 0 to 10V gives 0 to 100% of rated voltage
<b>mA Program:</b>	Differential input, 0 to 10V for 0 to 20mA(90kV) or 0 to 30mA(60kV).
<b>Power Program:</b>	Differential input, 0 to 10V gives 0 to 1000W
<b>mA Limit:</b>	0 to 33mA(90kV) or 0 to 44mA(60kV).
<b>Filament Current Limit:</b>	0 to 10V for 0 to 5A
<b>HV ON/OFF:</b>	Digital HV(X-ray) ON/Off control
<b>Filament Standby:</b>	Digital input, allows preset filament standby current to be selected during HV OFF.
<b>Filament Standby Level:</b>	0 to 10V for 0 to 5A Standby current
<b>Filament Select:</b>	Digital input, selects between two filament connections to the tube.
<b>KV Monitor:</b>	0 to 10V for 0 to 100% at the output
<b>KV Program Monitor:</b>	0 to 10V for 0 to 10V on the KV Program
<b>mA monitor:</b>	0 to 10V for 0 to 33mA(90kV) or 0 to 44mA(60kV) through the x-ray tube.
<b>mA Program monitor:</b>	0m to 10V for 0 to 10V on the mA Program
<b>Power Monitor:</b>	0 to 10V for 0 to 2000W at the output
<b>Power Program Monitor:</b>	0 to 10V for 0 to 10V on the Power Program
<b>Filament Current Monitor:</b>	0 to 10V for 0 to 5A in the filament
<b>Filament Voltage Monitor:</b>	0 to 10V for 0 to 16V at the filament.
<b>Trip:</b>	Digital output, indicates when the generator has tripped
<b>Over-Voltage:</b>	Digital output, indicates when an over-voltage has occurred at the HV output
<b>Over Temperature:</b>	Digital output, indicates when an over-temperature exists in the generator.
<b>Arc:</b>	Digital output, indicates when excessive arcing has been detected.
<b>Filament Open Circuit:</b>	Digital output, indicates when the filament voltage has exceeded a preset value, and no filament current is flowing.
<b>Filament Current Limit:</b>	Digital output, indicates when the filament current is at its preset limit. The mA output will not be at the required value.
<b>Interlock:</b>	Digital output, indicates when the external interlock chain and the front panel enable switch are all closed.

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**XR2000**

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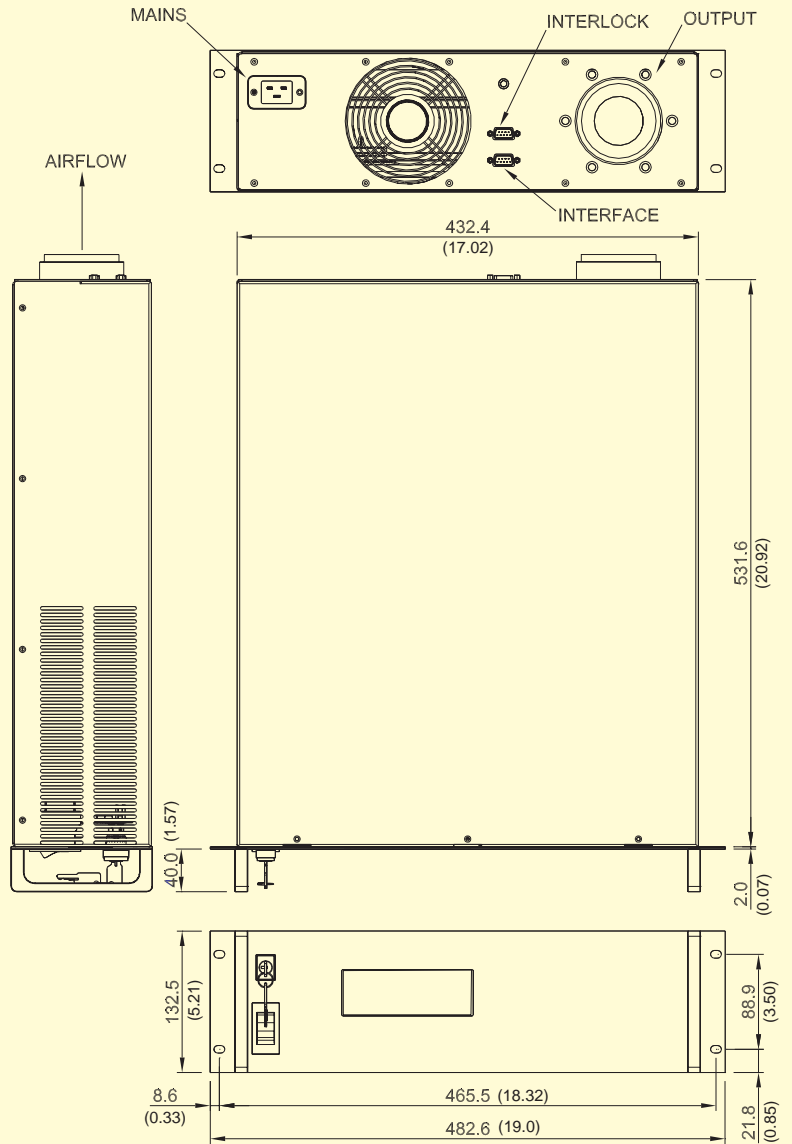
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**SPECIFICATION  
OUTLINE DRAWING**



Revision: 10/07

Drawing dimensions are in mm (inches)