

UltraBright

Microfocus X-Ray Source



- 4 mm Anode to Object distance
- True round spot
- Grounded target = High power, 80W
- Integrated design – No HV cable
- The choice for use with an x-ray optic due to close coupling (4 mm)
- Applications include microtomography, microdiffraction, microfluorescence, phase contrast imaging, and many others.



X-Ray Tube Unit Specifications

Feature	
Anode Current	.1 to 2 mA
Anode Voltage	10 to 90 kV
Maximum Power	80 W
Focal Spot Size	13 to 20 μm
Cone Angle	33°
Minimum Distance Focus/Object	4 mm
Target Angle/Viewing Angle	15/30°
Exit Window Diameter	9.50 mm
X-Ray Tube	Integrated/Sealed
Cooling Method	Air (150 CFM @ 4")
Be Window Thickness	245 μm
Cathode Type	Dispenser Cathode
Window Position	End Window
Environment Temperature	+10° to +55° C
Operation	Continuous
Approximate Weight	4 kg

Target Material / Part number	Min. Voltage	Max. Voltage	Min. Power	Max. Power	Power Density
Mo (96002)	20 kV	60 kV	20 W	60 W	1.5 W/ μm
Cu (96000)	20 kV	60 kV	20 W	60 W	1.5 W/ μm
W (96004)	10 kV	90 kV	10 W	80 W	2.5 W/ μm

Controller Unit Specifications

Functions	Key Switched Power, HV On/Off, kV Adjust, Brightness/Autofocus Adjust
External Control	Remote control
Power Consumption	100 W maximum
Input Voltage	110/240 AC autosensing
Approximate Weight	4 kg
HV Cable	Not Necessary
LV Cable	Std 25 pin D-type connector (up to 25 feet)

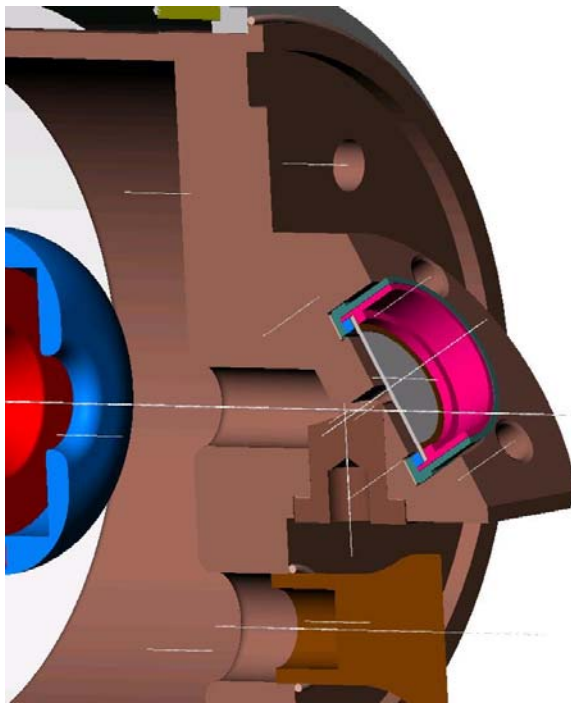
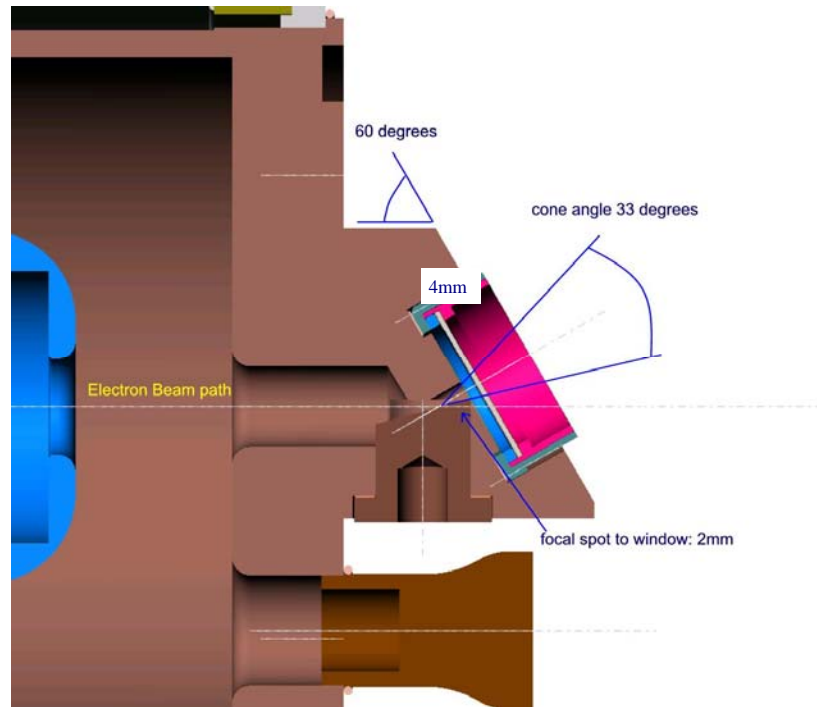
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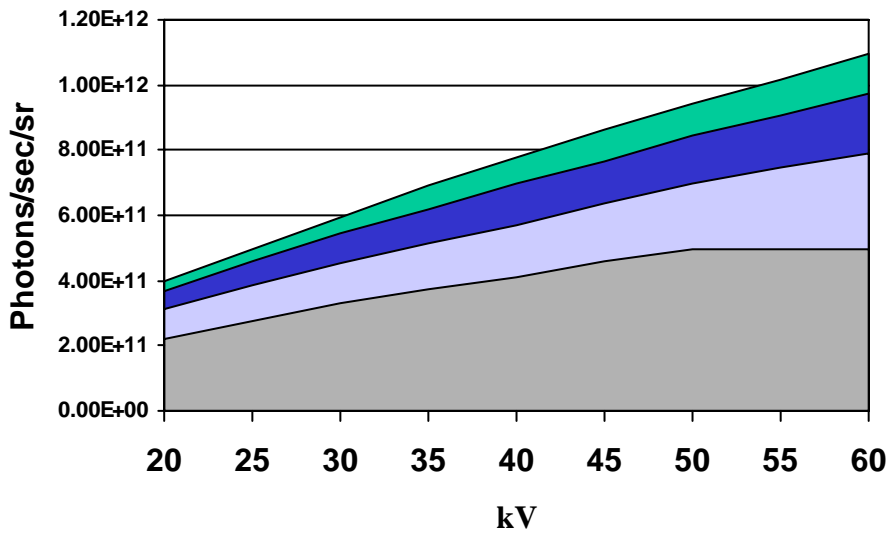
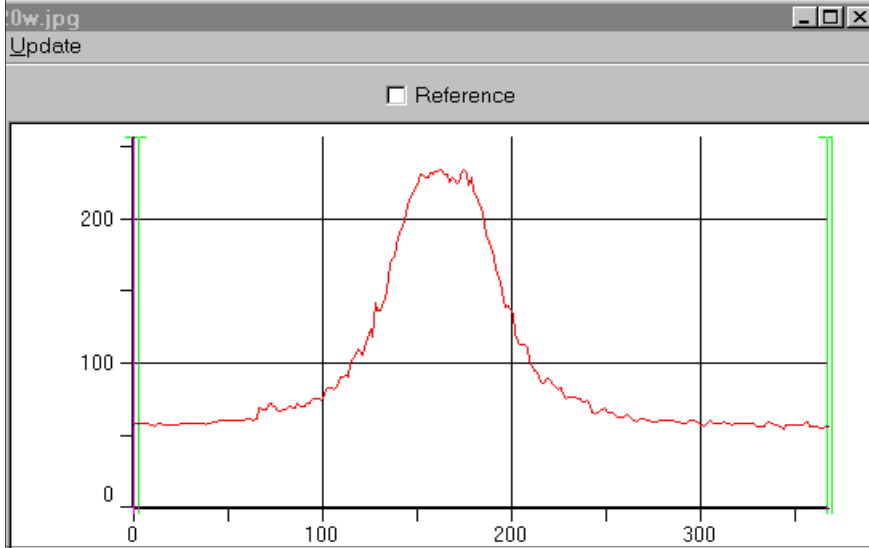
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Actual focal spot image and flux distribution

(40kV, 0.5mA, 20:1 geometric magnification)



True round focal spot provides for high flux, uniformly distributed.

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RS232 control command set

Protocol: RS-232-C
Baud Rate: 9600 ASYNC
Flow Control: None
Data Bits: 8
Stop Bits: 1
Parity: None
Connector: Type: 25 pin

Functions:

Anode Voltage Set: 10 to 90kV (example : VCN 50 = set 50kV)
Brightness Set: 10 to 80 Watts (example: WCN 40=set 40 watts)
G3 voltage Set: 0 to 5kV (example: GCN 03=set 3kV)
Command: X-ray ON/OFF
Command: Voltage min-max set
Command: Brightness min-max set

Read back:

Voltage: (example : VM 30 = 30kV)
Brightness: (example: WM20 = 20 watts)
Status: Stand-by, warm-up, output, fault modes in ASCII format
Fault: Display panel information except remote/local mode will be in ASCII format
Other: ROM version number

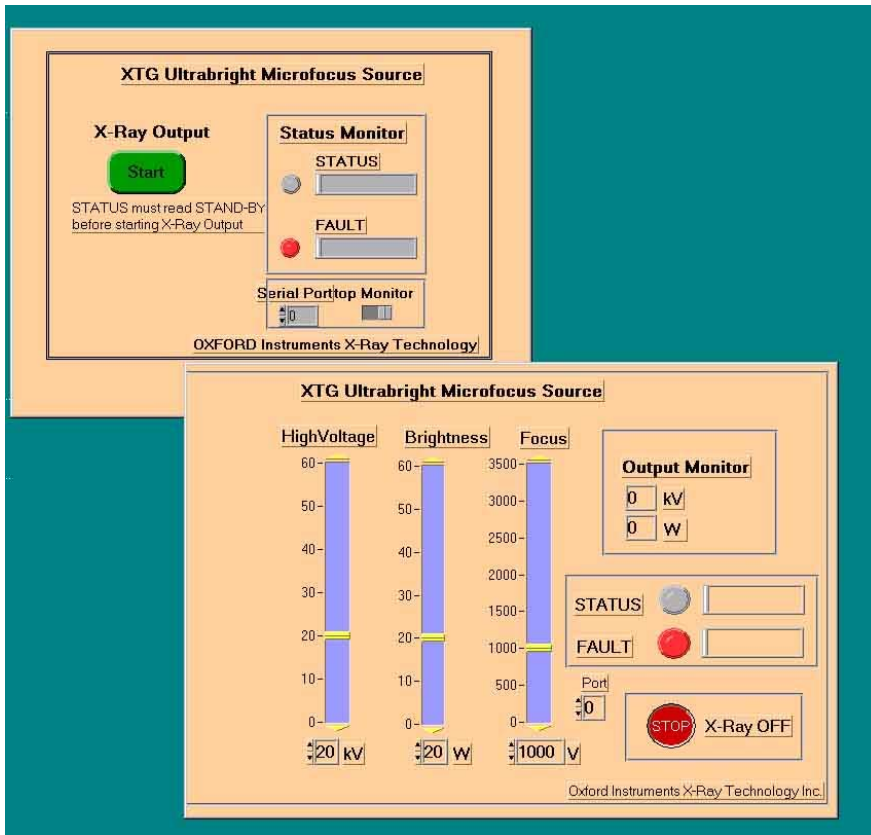
Power on can be accomplished remotely by X-ray on/off command. However, if filament is turned off, power is restored only through front panel on/off switch.

Item	RS232 Control	Manual Operation	Notes
Remote/Local switch	No	Yes	Switch is located on rear panel
Power On/Off	No	Yes	For remote operation, front panel On/Off switch must be "On"
X-Ray On/Off	Yes	Yes	For remote operation, front panel On/Off switch must be "On"
Voltage up/down	Yes	No	Front panel switch disabled
Brightness Control	Yes	No	Front panel switch disabled
G3 Span adjust	No	Yes	Rear panel Adjust
G2 adjust	No	Yes	Rear panel Adjust
Mode switch for G3	No	No	Rear panel Adjust disabled
Enter switch for G3	No	No	Rear panel Adjust disabled
G3 adjust	Yes	No	Internal control voltage disabled
G3 zero adjust	No	Yes	Rear panel Adjust

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Software Control Option



- Runs under LabVIEW RT & MS-Windows 95/98/NT
- Works in conjunction with RS232 Control Interface
- Complete control of Voltage, Power, and Focus
- Dynamic Status display
- Dynamic Fault display
- Ideal for R&D applications
- Open software architecture allows for modification to user interface with available additional development software



Functions	Software Control	Manual Operation	Notes
Remote/Local switch	No	Yes	Switch is located on rear panel
Power On/Off	No	Yes	For software operation, front panel On/Off switch must be "On"
X-Ray On/Off	Yes	Yes	For software operation, front panel On/Off switch must be "On"
Voltage up/down	Yes	No	Front panel switch disabled
Power adjust	Yes	No	Front panel Brightness dial disabled
Focus adjust	Yes	Yes	Rear panel Adjust – Brightness dial disabled
G2 adjust	No	Yes	Rear panel Adjust -Brightness dial disabled

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Microfocus Source with the following Specifications:

- (A) Microfocus Source has a fully integrated electron-impact X-ray tube. High voltage power supply and controller, capable of providing variable control of High Voltage from 10kV to 90kV and electron accelerating beam current from .1-2 milliamps, with full control of "Brightness". Smart controller calculates spot size for a given power setting for maximum flux output.
- (B) Voltage and current rating (90kV, 2.0mA) are subject to maximum power dissipation rating of 80 watts. The electron-impact tube assembly is sealed, air cooled, and rated for continuous operation.
- (C) X-ray micro-focus spot size is continuously adjustable from 13 microns to 20 microns. Power de-rating is provided at small spot sizes but source power is greater than or equal to 20 watts for a 20 micron spot size.
- (D) The anode target material is comprised of Tungsten as standard, however other targets are available (Cu, Rh, Mo etc). The target is inclined at a takeoff angle of 15 degrees with respect to the electron beam, and the exit window is aligned at an angle of 30 degrees with respect to the electron beam, so that a round micro-focus X-ray spot is projected through the exit window.
- (E) The stability of the micro-focus X-ray spot shall be less than 5 microns RMS over a period of 8 hours, as verified by test. A warm-up time of up to two hours is necessary in order to meet this specification.
- (F) The system is supplied with a 254 micron Be exit window, allowing for close coupling of 4 mm object placement from the anode.
- (G) LabVIEW RT Software Interface: The Smart Controller is outfitted with a software package that will allow for remote control of the various functions, such as kV, mA, Brightness, power etc. Includes RS232 Communication package, and RT version of National Instruments LabVIEW. See Software control data-sheet for complete description.
- (H) Special engineering requests: Contact Sales@oxfordxtg.com for information and pricing on special needs. These have included in the past projects such as windowless designs, X-ray optics mounting needs, and special anode targets.