



Beam delivery system GeniX^{3D} CU High Convergence

Dec. 2010



Fig. 1: X-ray head and Control unit

The GeniX 3D Cu High Convergence combines a high brightness, low power X-ray source with aspheric FOX3D multilayer optics to deliver an intense monochromatic Cu K α beam focused on a small spot with high convergence angles of few degrees. It is provided with a control and command unit having intuitive user interface and implementing advanced functionalities to maintain a safe operation of the system.

The GeniX 3D Cu HC is configured with a focusing multilayer optic providing a high convergence angle for enhanced flux density with a comfortable focusing distance for grazing incidence applications or measurements requiring sample clearance. The optimal coupling of the high convergence precision optic and the microfocus source ensures a well defined, small spot at focus. Optional slits can be mounted to limit the system's convergence angle in one plane and thus optimize measurement resolution while maintaining an intense beam at the sample.

The excellent beam properties are matched by an unprecedented stability and high reliability to provide a powerful, cost-effective, and low maintenance beam delivery system, ideal for applications that require a small spot, with very high beam intensity.

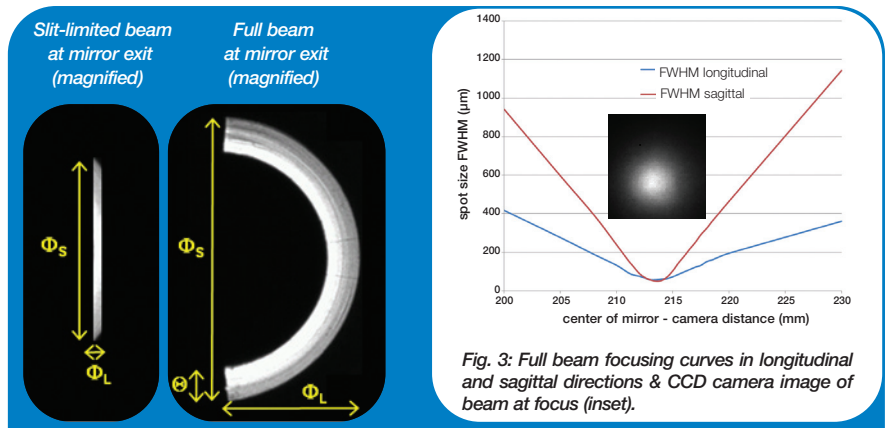


Fig. 2: CCD images of GeniX 3D Cu High Convergence at the mirror exit for: the beam limited by a slit (left) and the full beam (right).

Fig. 3: Full beam focusing curves in longitudinal and sagittal directions & CCD camera image of beam at focus (inset).

Applications

- Rapid X-ray Reflectometry (full beam)
- Scanning X-ray Reflectometry (with slit)
- Small Spot diffraction for in-line metrology
- Grazing incidence X-ray diffraction
- X-ray fluorescence

Benefits

- very high flux density
- excellent beam focusing
- extremely stable beam
- compact system - easy to integrate
- low power & low maintenance source
- smart source power management
- intuitive user interface

Options

- slit limiting aperture for optic convergence
- configurable collimator system

Accessories

- alignment camera
- pin diode detector
- dry vacuum pump
- water to air chiller

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Preliminary Technical Data

Subject to technical changes without notice

Beam features

• Wavelength	1.54 Å / 8 keV (Cu K α)	
• Spot size at focus (30W/40 µm FWHM source)	~ 60 x 60 µm ² FWHM	
• System output to focus distance	~ 16 cm (without collimator)	
• Beam configuration	Full beam	Slit-limited Beam
• Typical flux (in vacuum, 30W/50KV-0.6mA source)	~ 400 x 10 ⁹ photons/s	~ 23 x 10 ⁹ photons/s
• Beam Convergence (Φ_L , Φ_S and Θ are defined in Fig.2)	$\Phi_S \geq 4$ degrees $\Phi_L \geq 2$ degrees $\Theta = 0.54$ degrees	$\Phi_S = 2.6$ degrees $\Phi_L = 0.05$ degrees

Electronic

• Dimensions	3U — 19" - 600 mm in depth
• Total weight	13.6 Kg
• Power	110/220 V (AC) or 24 V (DC)

Head

• Dimensions (L x W x H)	42 x 12 x 37 cm ³
• Total weight	~ 14.5 Kg

Integration

• System power consumption	150 Watts
• Remote control features	Ethernet port & software utility
• System shutters	Safety shutter
• Cooling flow rate (closed loop)	>1.2 l/min (set point 25°C)
• Dry vacuum pump	Working pressure : 3 mbar Pumping speed : 0.6 m ³ /h