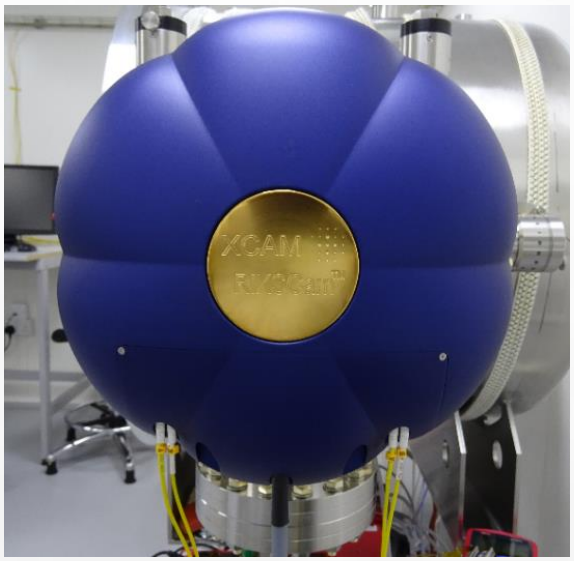
RIXSCam™

High Resolution and Sensitivity for RIXS Synchrotron Beamlines

Introduction

The RIXSCam™ system, originally designed in collaboration with scientists at the Paul-Scherrer Institute (PSI) for the Swiss Light Source ADRESS beamline, has been specifically developed for use on the latest coherent X-ray beamlines for resonant inelastic X-ray scattering (RIXS) experiments.



RIXSCam™ camera head

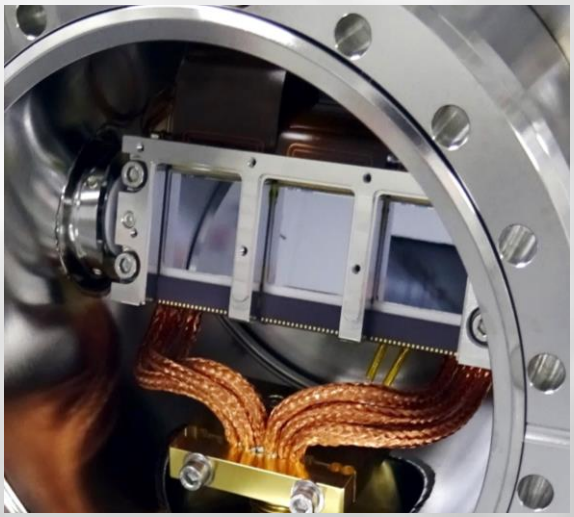
Centroiding technology gives this system an unbeatable spatial resolution, allowing energy to be resolved to an unprecedented degree. The rotatable detector bench, which holds up to three detectors, allows the operator to foreshorten the effective pixel size by changing the angle of incidence with the beam to improve the resolution further.

The use of EMCCDs gives rise to single photon detection, increasing the intensity of photons detected.

RIXSCam™ builds on XCAM's tradition of collaborative design, catering to the individual needs of customers whoa are working to the most demanding requirements, particularly where there is no existing solution available.

Key features

- Soft (250-3000 eV) X-ray detection
- <5 µm spatial resolution
- Single-photon detection
- Sub-electron read noise
- User-controlled effective pixel size
- Variable detector angle of incidence
- Large detector area
- XHV-compatible manufacture
- Up to three back-illuminated EMCCD detectors
- Customisable to individual requirements



Three EMCCD detectors on a rotatable bench

The recent RIXSCam™ installation at PSI has allowed *"RIXS experiments with an energy resolution improved by about 30% and with triple of the total intensity of the previously installed CCD camera."*

Source: PSI Facility Newsletter http://facility-news.psi.ch/ii_17.html

XCAM Ltd. | 2 Stone Circle Road, Northampton, NN3 8RF, UK | +44 1604 673 700
www.xcam.co.uk | info@xcam.co.uk

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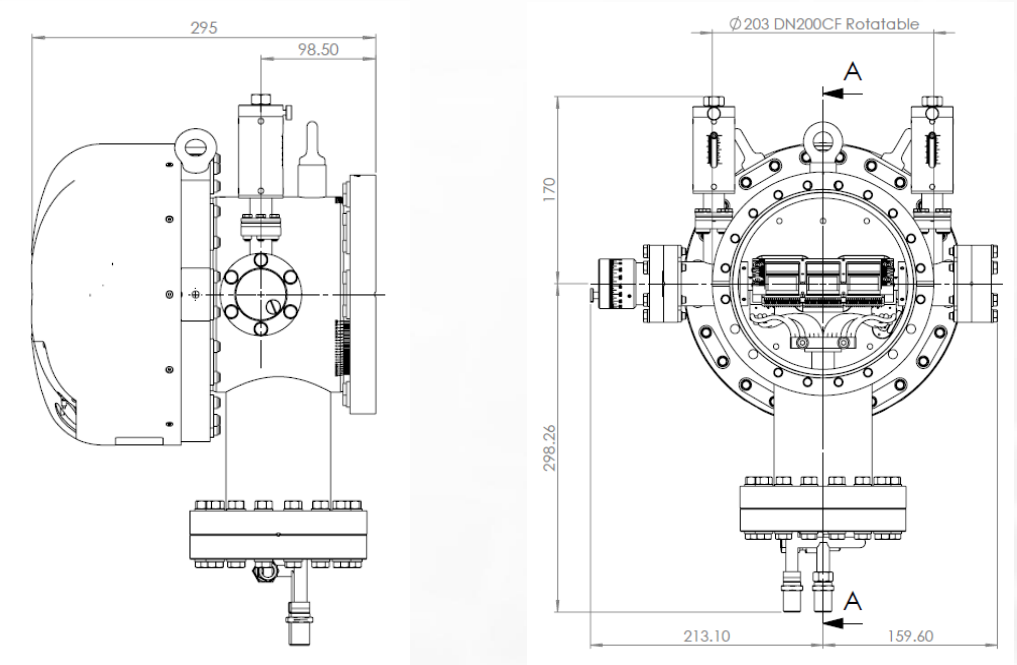
Technical Drawings



Specifications

Model	RIXSCam1	RIXSCam2	RIXSCam3
Number of detectors	1	2	3
Total active area	26.11 x 25.73 mm	52.22 x 25.73 mm	78.33 x 25.73 mm
Active pixels (H x V)	1632 x 1608	3264 x 1608	4896 x 1608
Pixel size	16 x 16 µm		
Readout rate	3 MHz		
System noise (LS gain of 150)	≤1 e-		
System noise (no LS gain)	≤140 e-		
System noise HR output	≤25 e-		
Detector angle of incidence	20° to 90°		
Vacuum compatibility	10^{-9} mbar		
Detector temperature control	-110˚C to -50˚C		
Post-processed resolution[1]	<5 µm		
Weight	25 kg		
Mechanical interface	DN100CF		
Data interface	Cameralink interface via fibre optic cables		
Housing material	304L stainless steel		
Cooling	Cryogenic		
Operating environment	2˚C to 35˚C temperature 20% to 90% relative humidity (non-condensing)		
Warranty	24 months		
Certification	CE		

1 The actual spatial resolution achieved will also depend on the local experimental set-up.

XCAM Ltd.
2 Stone Circle Road
Northampton
NN3 8RF
UK

Tel: 44 (0)1604 673700
Fax: 44 (0)1604 671584
Web: www.xcam.co.uk
Email: sales@xcam.co.uk