

DECTRIS
detecting the future



PILATUS3 100K-M

Compact and variable Hybrid Photon Counting detector



A versatile HPC detector for soft and hard X-rays

The PILATUS3 100K-M detector is a Hybrid Photon Counting (HPC) detector delivering ultimate X-ray data quality. Its separate detector head makes this detector extremely compact and lightweight. The 100K-M is available for your home laboratory (R series) as well as for synchrotron sources demanding frame rates (X series) of up to 500 fps. Built from a single detector module, the 100K-M is the ideal choice whenever your application sets strict constraints on space or does not require a large detection area. For example, the 100K-M is optimal for following the change of individual diffraction spots or for integrating a subsection of diffraction rings.

For soft X-ray applications, the optional vacuum compatibility and feedthrough sets let you integrate the detector head easily into your vacuum chamber reaching vacuum pressure down to 10^{-6} mbar. Additional low-energy calibrations allow detection of X-rays down to 1600 eV energy threshold.

Hard X-ray applications can employ the version with CdTe sensor, which offers a sensitivity of more than 80% up to 80 keV photon energy.

Key Advantages

- Lightweight detector head 0.9 kg, compact form factor
- Vacuum compatible down to 10^{-6} mbar (option)
- Low-energy calibration options incl. removable detector window (for silicon versions)
- High energies with CdTe sensor
- HPC technology: no readout noise, no dark signal, high dynamic range
- Sharp point spread function (1 pixel wide)
- Fluorescence suppression

Applications

- WAXS detector in SAXS/WAXS
- XRD and powder diffraction
- X-ray diffraction (XRD)
- Spectroscopy on fusion plasma
- High-pressure/high-temperature XRD
- Time-resolved in-situ measurements



Technical specifications

PILATUS3 100K-M

PILATUS3 R 100K-M

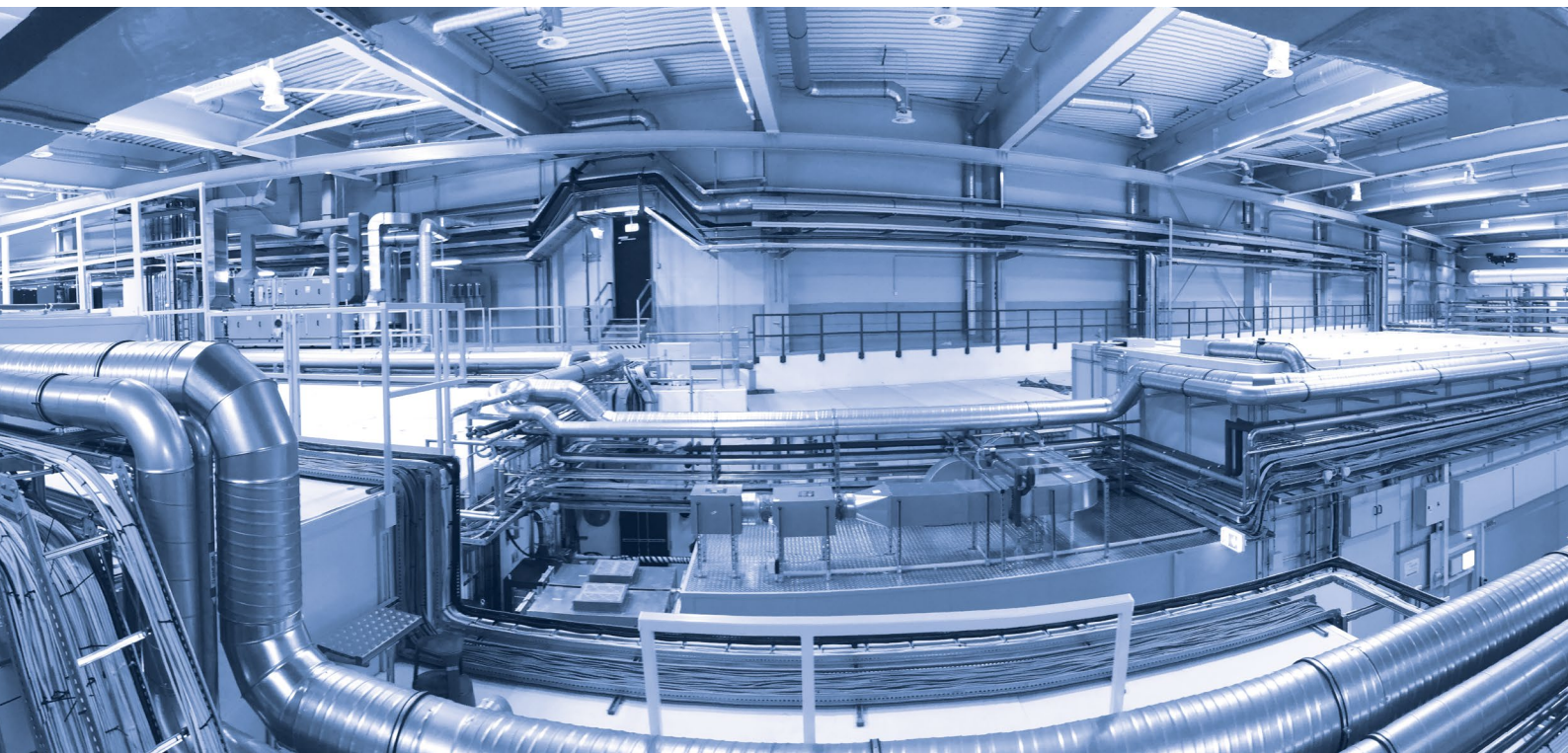
PILATUS3 X 100K-M

PILATUS3 R CdTe 100K-M

PILATUS3 X CdTe 100K-M

Sensor type and thickness [μm]	Si 450, Si 1000 (optional)		CdTe 1000	
Number of detector modules	1 × 1 = 1			
Sensitive area (width × height) [mm²]	83.8 × 33.5			
Pixel size (width × height) [μm²]	172 × 172			
Pixel Array Format (width × height)	487 × 195 (94,965 pixels)			
Maximum frame rate [Hz]	20	500	20	500
Readout time [ms]	7	0.95	7	0.95
Maximum count rate [phts/s/pixel]	1 · 10 ⁷			
Counter depth [bit]	20 bits (1,048,576)			
Point-spread function	1 pixel (FWHM)			
Threshold energy [keV]	2.7 - 18 (standard)		8 - 40 (standard)	
Gap on module	-		1 pixel wide	
Inactive area	-		0.2 %	
Defective pixel	< 0.03 %		< 0.1 %	
Dimensions (WHD) [mm³]	Detector Head: 114 × 69 × 118, Detector Electronics Unit: 156 × 155 × 210			
Weight [kg]	Detector Head: 0.9, Detector Electronics Unit: 2.5			
Cooling	Detector Head: water-cooled, Detector Electronics Unit: air-cooled			
Vacuum compatibility option	yes, down to 10 ⁻⁶ mbar			
Removable window	yes, with vacuum compatibility		-	
Low-energy calibration options	yes		-	

All specifications are subject to change without notice.



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