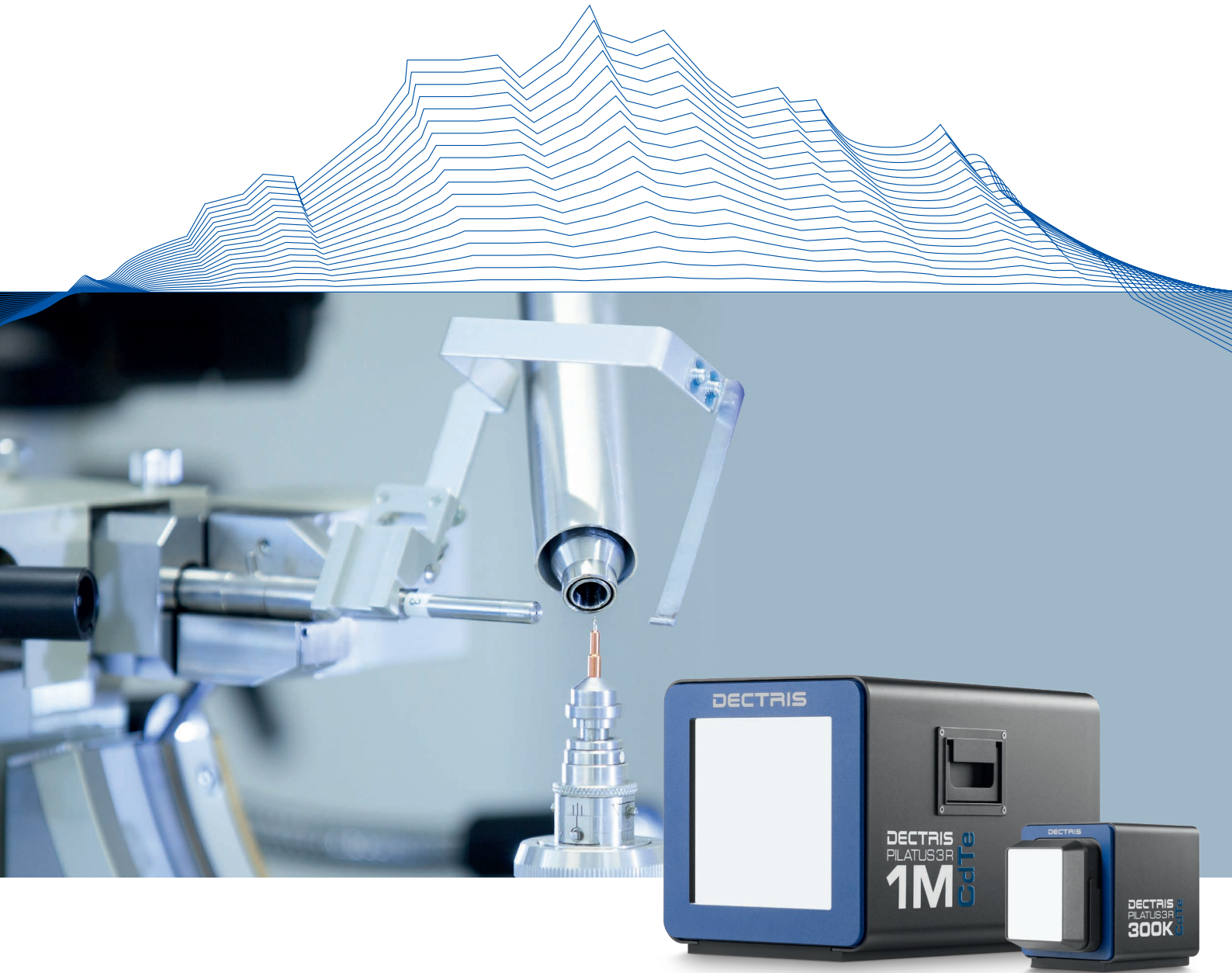


**DECTRIS**  
detecting the future



# PILATUS3 R CdTe

*High energy Hybrid Photon Counting detectors for your laboratory*



### HPC and direct detection of hard X-rays for ultimate data quality

The PILATUS3 R CdTe series of detectors combines the advantages of Hybrid Photon Counting (HPC) with the benefits of direct detection of hard X-rays in large cadmium telluride (CdTe) sensors. CdTe provides close to 100% absorption efficiency for Mo, Ag, and In radiation. Combined with noise-free single-photon counting, this brings X-ray detection in the laboratory to a new level of sensitivity and accuracy.

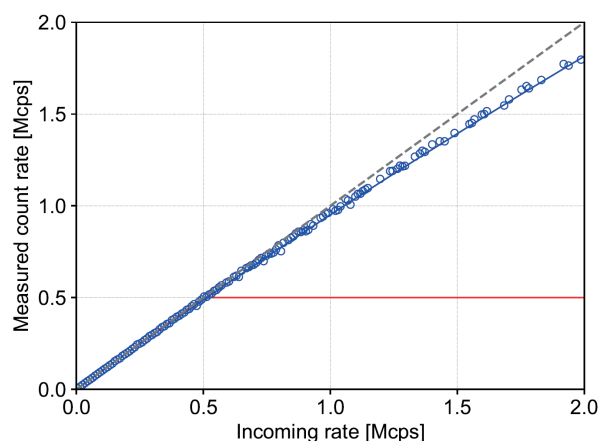
Challenging laboratory applications such as charge density studies and pair distribution function analysis rely on hard radiation and on data with outstanding signal-to-noise ratios. The PILATUS3 R CdTe detectors excel in these applications because of the absence of dark current and readout noise and a dynamic range that is vastly superior to that of a typical charge-integrating detector.

#### Key Advantages

- Quantum efficiency > 90% for Mo, Ag, and In
- Direct detection for sharpest spatial resolution
- No readout noise and no dark signal for highest accuracy
- High dynamic range
- Fluorescence background suppression
- Maintenance-free operation
- High reliability: No failure-prone sealing or cooling below room temperature

#### Applications

- High-resolution chemical crystallography
- High-pressure/high-temperature XRD
- Pair distribution function (PDF) analysis
- Critical Dimension SAXS
- Computed tomography (CT)



Count rate performance of PILATUS3 R CdTe detectors. Measured (blue circles) and theoretical (blue line) count rate performance across the intensity range relevant for laboratory experiments. PILATUS3 R CdTe closely matches the response of an ideal detector (dashed line). The small deviations are corrected by the detector software. PILATUS3 R CdTe accurately measures intensities far beyond the capabilities of a typical charge-integrating detector (red line).

## Technical specifications

PILATUS3 R CdTe	300K	300K-W	1M
Number of detector modules	1 x 3	3 x 1	2 x 5
Sensitive area, width x height [mm <sup>2</sup> ]	83.8 x 106.5	253.7 x 33.5	168.7 x 179.4
Pixel size [μm <sup>2</sup> ]	172 x 172	172 x 172	172 x 172
Total number of pixels	487 x 619 = 301'453	1475 x 195 = 287'625	981 x 1043 = 1,023,183
Gap between modules (horiz./vert.) [pixel] * plus 1 pixel horizontal gap on each module	-*/17	7*/-	7*/17
Inactive area [%]	5.7	1.1	7.1
Defective pixels [%]	< 0.1	< 0.1	< 0.1
Maximum frame rate [Hz]	20	20	5
Readout time [ms]	7	7	7
Pointspread function	1 pixel (FWHM)	1 pixel (FWHM)	1 pixel (FWHM)
Maximum count rate [phts/s/pixel]	1 x 10 <sup>7</sup>	1 x 10 <sup>7</sup>	1 x 10 <sup>7</sup>
Counter depth [bit]	20 bits (1,048,576)	20 bits (1,048,576)	20 bits (1,048,576)
Power Consumption [W]	30	30	165
Dimensions (WHD) [mm <sup>3</sup> ]	158 x 193 x 262	280 x 62 x 296	265 x 286 x 455
Weight [kg]	7.5	7.0	25
Cooling	Water-cooled	Water-cooled	Water-cooled

All specifications are subject to change without notice.





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