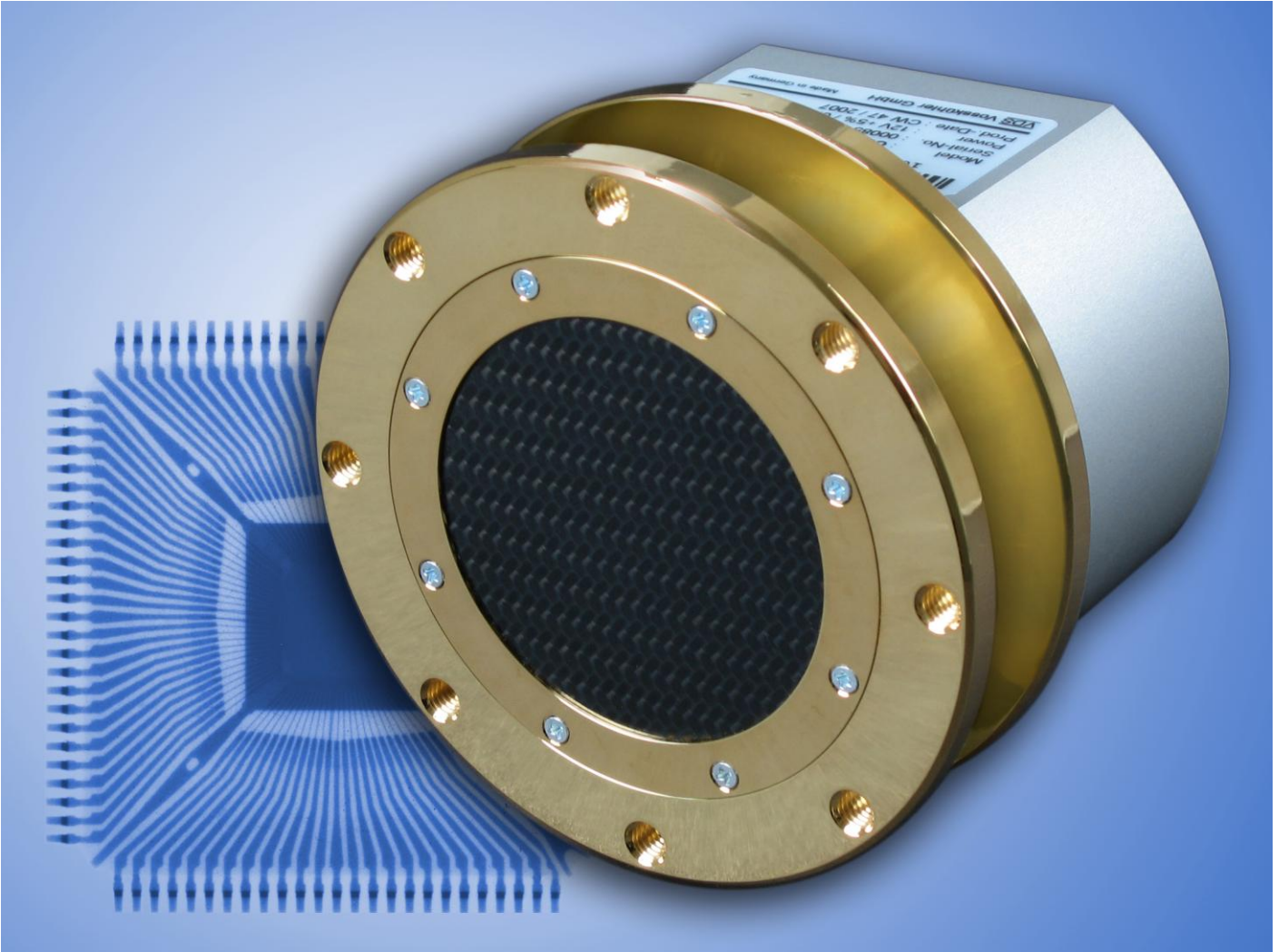


# CCD-/COOL-11000XR

Extreme high resolution X-RAY detector



## Features

- 4024 (H) x 2680 (V) pixels, 3 fps or
- 2012 (H) x 1340 (V) pixels, 6 fps (2 x 2 Binning)
- Resolution: > 25 lp/mm
- Energy range: 20 ... 150 keV
- X-ray protection of the sensor by integrated fibre optics
- Detector area: 36 (H) x 24 (V) mm
- No distortion, no shading
- No mechanical shutter
- Option: **COOL-11000XR** peltier cooled for longer exposure times

With the **CCD-/COOL-11000XR** VDS Vosskühler presents for the first time a very high resolution x-ray detector with 11 MPixels.

The image resolution takes place at 4024 (H) x 2680 (V) pixels with up to 3 fps or within 2 x 2 Binning-Mode at 2012 (H) x 1340 (V) pixels with up to 6 fps.

The detector achieves a resolution of higher than 25 lp/mm at an active sensor area of 36 (H) x 24 (V) mm.

By means of the integrated fibre optics an x-ray protection exists for the sensitive CCD-sensor. Therefore the detector can be employed in an energy range of 20 – 150 keV. On the contrary to x-ray area detectors the life time within permanent operation is considerably higher due to the fibre optics.

Because of the high resolution of the **CCD-/COOL-11000XR** camera, less expensive x-ray sources with essential bigger spot size can be used for the same system resolution.

Owing to the interline transfer sensor no mechanical shutter is necessary. For this reason the camera can also be employed at continuous x-ray sources.

The detector achieves a dynamics of higher than 60 dB at a read-out noise of less than 60 e.

For the 12bit digital data the following Interfaces are available: RS644, Camera Link or Gigabit Ethernet.

By means of the optional peltier cooling (**COOL-11000XR**) the sensor is cooled to 5 °C fix, enabling to achieve clearly longer exposure times.

**Applications:**

- X-ray microscopy
- Micro Tomography
- Printed Circuit Board Inspection
- Semiconductor Inspection
- Spot size inspection of x-ray tubes
- X-ray diffractometry

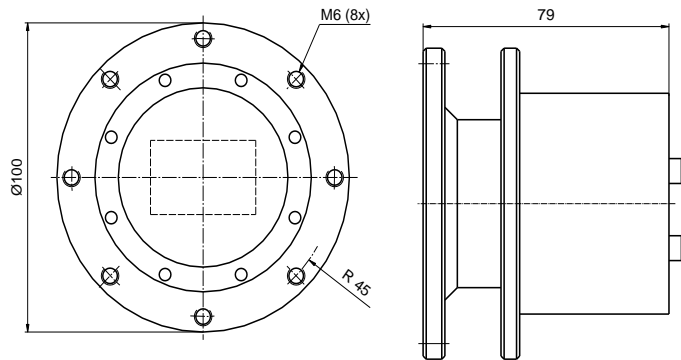
**Technical Data**

- Resolution: 4024 (H) x 2680 (V) pixels or 2012 (H) x 1340 (V) pixels
- Image rate: 3 frames/sec. (4024 x 2680) or up to 6 frames/sec. (2012 x 1340)
- Resolution: 25 lp/mm
- Energy range: 20 – 150 keV
- Active area: 36.18 (H) x 24.12 (V) mm
- Pixel size: 9 µm x 9 µm
- Szintillator: 150 µm, CsI
- Interline transfer sensor (no mech. shutter required)
- Image on demand
- Effective dynamics: ≥ 1:1000 (≥ 60 dB)
- Sensor saturation: ≥ 60,000 e (Full resolution) ≥ 120,000 e (Binning)
- Read out noise: < 60 e
- Anti-blooming circuit
- Exposure time up to approx. 2 sec. (non-cooled), longer than 10 sec. (cooled)
- Digital output: 12-bit, RS-644 (LVDS), CL, GigE
- Pixel clock: 40 MHz
- Video gain: 1 or 2 (+ 6 dB)
- Power supply: + 12 V (SELV), approx. 0.6 A, cooled max. 2.7 A
- Ambient air temperature: 0° to 40° C
- CE standard
- Made in Germany

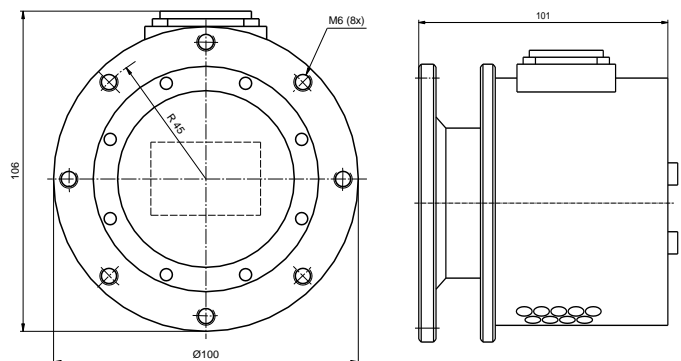
RS-644 Digital Output (37-pin D-SUB Jack)			
Pin	Function	Pin	Function
1	PCLK	20	/PCLK
2	LEN	21	/LEN
3	FEN	22	/FEN
4	D0	23	/D0
5	D1	24	/D1
6	D2	25	/D2
7	D3	26	/D3
8	D4	27	/D4
9	D5	28	/D5
10	D6	29	/D6
11	D7	30	/D7
12	D8	31	/D8
13	D9	32	/D9
14	D10	33	/D10
15	D11	34	/D11
16	GND	35	GND
17	/TRES	36	TRES
18	/SV2	37	Mode
19	/BIN		

Power and Control Input (15-pin D-SUB Jack)	
Pin	Function
1	
2	+12V DC
3	
4	GND
5	
6	
7	
8	
9	Mode: (Open) → Continuous (GND) → IOD
10	- Trigger Input (Opto Coupler)
11	+ (Opto Coupler)
12	- Exposure Output (Opto Coupler)
13	+ (Opto Coupler)
14	Line Sync Output
15	Frame Sync Output

**CCD-11000XR:**



**COOL-11000XR:**



Order codes	
Camera	Art. No.
CCD-11000XR	1017200
COOL-11000XR	1029200