HAMAMATSU

DATA SHEET

(1024 × 1024 pixels BT(back-thinned) CCD)

High resolution BT(Back-thinned)-CCD Cooled Digital Camera

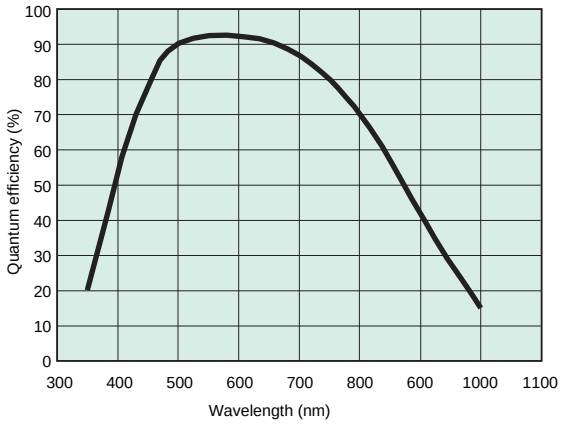
ORCA Ⅱ-BT-1024

4 stage peltier type

▲ Hermetic vacuum sealed air-cooled head type

The ORCA Ⅱ-BT-1024 features the well known E2V technolgies CCD47-10 chip packaged in a proprietary permanently sealed vacuum chamber evacuated to 10^{-7} Torr. This very high resolution, back thinned, back illuminated, million pixel CCD offers very high quantum efficiency over the spectrum from 350 nm to 900 nm. With a large full well capacity, low read noise and MPP (Multi-Pinned Phase) technology in the drive circuits to reduce dark current, this camera will produce rapid exposures and high dynamic range images. Dual mode digitization offers a software selectable choice of speed or very low noise readout methods with 12 bit to 16 bit precision. Special analog contrast enhancement circuits increase versatility for even the most difficult imaging conditions.

SPECTRAL RESPONSE CHARACTERISTIC



* This is typical, not guaranteed.

FEATURES

- **Very high resolution format (1024 × 1024 pixels)**
- **High cooling performance with 4-stage peltier device**
- **High quantum efficiency from UV to NIR**
- **Very large full well capacity (80000 electrons typ.)**
- **Low readout noise design (4 electrons r.m.s. typ.)**
- **Software selectable dual digitizers**
- **Analog contrast enhancement**

TYPE NUMBER

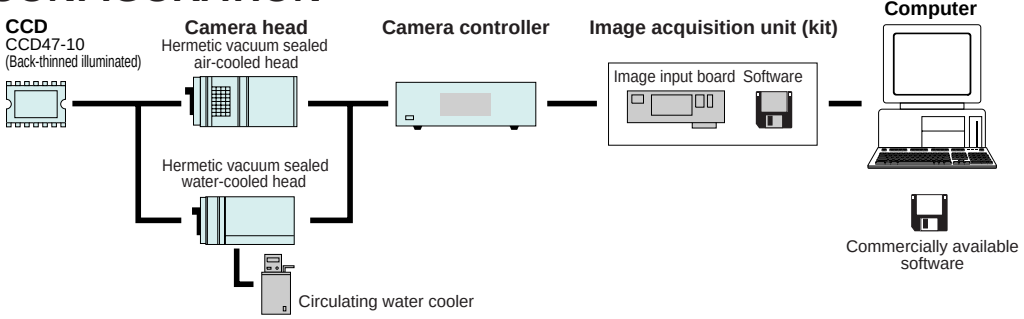
C4742-98-26K□2

Cooling method
A: Air-cooling
W: Water-cooling

APPLICATIONS

- **Luminescence and Fluorescence**
- **High resolution video microscopy**
- **Semiconductor imaging**
- **X-ray applications**
- **Neutron radiography**
- **Scintillator readout**

SYSTEM CONFIGURATION



SPECIFICATIONS

Type number	C4742-98-26KA2	C4742-98-26KW2
Camera head type	Hermetic vacuum sealed air-cooled head	Hermetic vacuum sealed water-cooled head
Circulating water cooler (sold separately)	–	Required
Mechanical shutter	Built-in (Control: OPEN / CLOSE / AUTO)	
Imaging device	CCD47-10 full-frame transfer CCD	
Effective no. of pixels	1024 (H) × 1024 (V)	
Cell size	13 µm(H) × 13 µm(V)	
Effective area	13.3 mm(H) × 13.3 mm(V)	
Pixel clock rate	312.5 kHz/pixel (High-precision readout) / 5 MHz/pixel (High-speed readout)	
Frame rate	0.28 frame/ s (High-precision readout) / 3.05 frame/s (High-speed readout)	
Readout noise (r.m.s.) (High-precision readout) typ.	4 electrons	
Full well capacity	80000 electrons	
Dynamic range* (High-precision readout) typ.	20000 : 1	
Cooling method	Peltier cooling / forced-air-cooling + hermetic sealing	Peltier cooling / water-cooling + hermetic sealing
Cooling temperature**	- 65 ˚C	- 75 ˚C
Dark current	0.0065 electrons/pixel/s	0.0012 electrons/pixel/s
A/D converter (High-precision readout)	16 bit (High-precision readout) / 12 bit (High-speed readout)	
Output signal (High-precision readout)	RS-422A 16 bit parallel output	
Exposure time	20 ms to 7200 s	
External control	RS-232C	
Sub-array	Yes	
External trigger	Yes	
Contrast enhancement	1, 4, 18 times (High-precision readout) / 1 to 6 times (High-speed readout)	
Lens mount	C-mount	
Line voltage	AC 100 V/ AC 117 V/ AC 220 V/ AC 240 V, 50 Hz/60 Hz	
Power consumption	approx. 220 V•A	
Ambient storage temperature	-10 ˚C to +50 ˚C	
Ambient operating temperature	0 ˚C to +40 ˚C	
Ambient operating/storage humidity	70 % max. (with no condensation)	

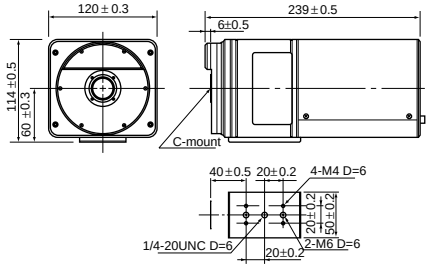
Binning		1 × 1	2 × 2	4 × 4	8 × 8
Frame rate	High-speed readout	3.05 frame/s	4.58 frame/s	6.12 frame/s	7.36 frame/s
	High-precision readout	0.28 frame/s	0.54 frame/s	1.01 frame/s	1.83 frame/s

Subarray		256 × 256	128 × 128
Frame rate	High-speed readout	4.58 frame/s	6.12 frame/s
	High-precision readout	0.93 frame/s	2.52 frame/s

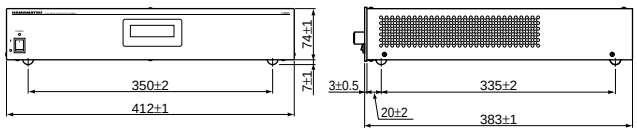
* Calculated from the ratio of the full well capacity and the readout noise.
** Air-cooled head; outside air temperature at +20 ˚C
Water-cooled head; water temperature at +15 ˚C

DIMENSIONAL OUTLINES (Unit: mm)

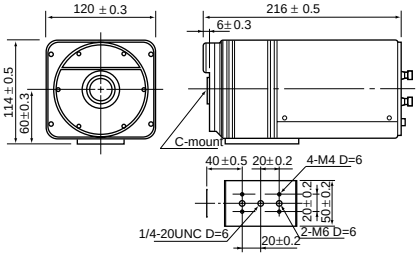
- **Hermetic vacuum sealed air-cooled head (approx. 2.5 kg)**



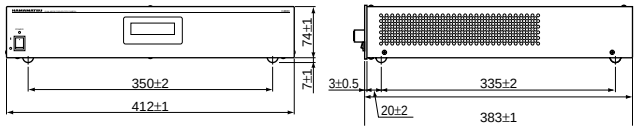
- **Camera controller (approx. 8.5 kg)**



- **Hermetic vacuum sealed water-cooled head (approx. 2.5kg)**



- **Camera controller (approx. 8.5 kg)**



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