

HAMAMATSU

DATA SHEET

(512 × 512 pixels BT(back-thinned) CCD)

BT(Back-thinned)-CCD Cooled Digital Camera ORCA II -BT-512G

4 stage peltier type



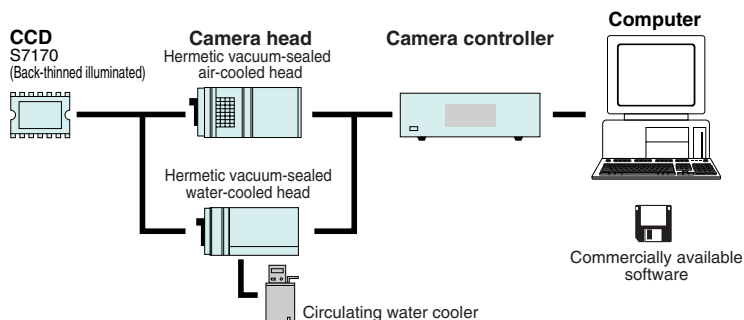
▲ Hermetic vacuum sealed air-cooled head type

The ORCA II -BT-512G features an original and unique Hamamatsu S7170 CCD chip packaged in a proprietary permanently sealed vacuum chamber evacuated to 10^{-7} Torr. This high resolution, back thinned, back illuminated CCD offers very high quantum efficiency over the spectrum from 200 nm to 1000 nm. With a huge 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 very 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. A high performance serial bus IEEE 1394 is used as a computer interface.

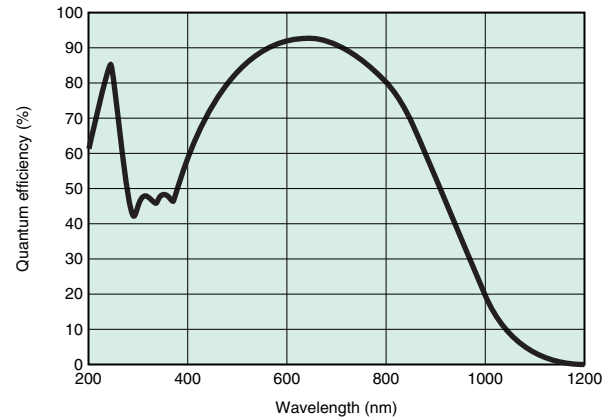
APPLICATIONS

- Luminescence and Fluorescence
- Video microscopy
- Semiconductor imaging
- X-ray applications
- Neutron radiography
- Scintillator readout

SYSTEM CONFIGURATION



SPECTRAL RESPONSE CHARACTERISTIC



* This is typical, not guaranteed.

FEATURES

- High resolution format (512 × 512 pixels)
- High cooling performance with 4-stage peltier device
- High quantum efficiency from UV to NIR
- Very large full well capacity (230000 electrons typ.)
- Low readout noise design (7 electrons r.m.s. typ.)
- Software selectable dual digitizers
- Analog contrast enhancement
- Compatible with IIDC 1394-based digital camera specifications
- Full remote control from PC via IEEE 1394 Bus

TYPE NUMBER

C4742-98-26 L G2

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



Hamamatsu is a member of 1394 Trade Association

SPECIFICATIONS

Type number	C4742-98-26LAG2	C4742-98-26LWG2
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	S7170 full-frame transfer CCD	
Effective no. of pixels	512 (H) × 512 (V)	
Cell size	24 μm (H) × 24 μm (V)	
Effective area	12.29 mm (H) × 12.29 mm (V)	
Pixel clock rate	156 kHz/pixel (High-precision readout) / 2.5 MHz/pixel (High-speed readout)	
Frame rate	0.55 frame/s (High-precision readout) / 6.34 frame/s (High-speed readout)	
Readout noise (r.m.s.) (High-precision readout) typ.	7 electrons	
Full well capacity typ.	230000 electrons	
Dynamic range* (High-precision readout) typ.	32875 : 1	
Cooling method	Forced air peltier cooling, with hermetic sealing	Water-cooling and peltier cooling, with hermetic sealing
Cooling temperature**	- 65 °C	- 75 °C
Dark current	0.17 electrons/pixel/s	0.032 electrons/pixel/s
A/D converter (High-precision readout)	16 bit (High-precision readout) / 12 bit (High-speed readout)	
Interface / Output signal (High-precision readout)	IEEE 1394-1995 / Non-compressed data (Mono 16)	
Exposure time	20 ms to 7200 s	
External control	IIDC 1394-Based Digital Camera Specification Ver.1.30	
Sub-array	Yes	
External trigger	Yes	
Contrast enhancement	1, 4, 16 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)	

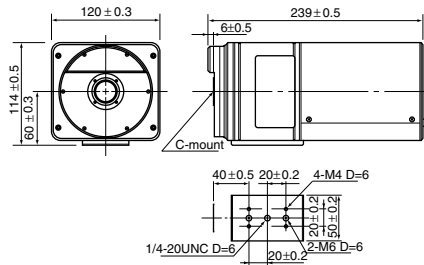
Binning		1 × 1	2 × 2	4 × 4	8 × 8	Subarray	256 × 256	128 × 128
Frame rate	High-speed readout	6.34 frame/s	9.84 frame/s	13.6 frame/s	16.8 frame/s	High-speed readout	9.84 frame/s	13.6 frame/s
	High-precision readout	0.55 frame/s	1.07 frame/s	2.05 frame/s	3.75 frame/s	High-precision readout	1.86 frame/s	5.17 frame/s

* Calculated from the ratio of the full well capacity and the readout noise.

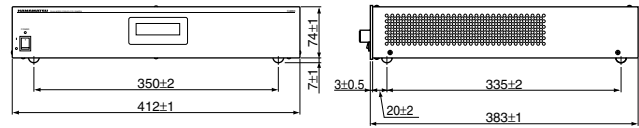
** Air-cooled head; outside air temperature at +20 °C
Water-cooled head; water temperature at +15 °C

DIMENSIONAL OUTLINES (Unit: mm)

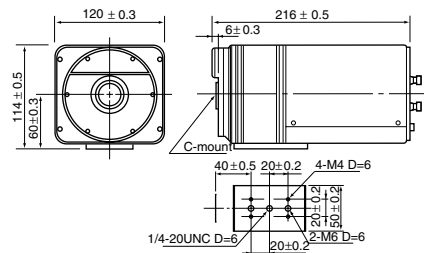
- Hermetic vacuum sealed air-cooled head (approx. 2.5 kg)



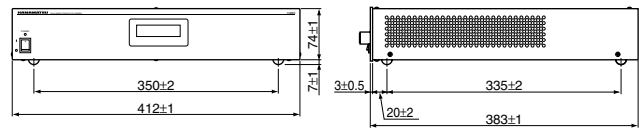
- Camera controller (approx. 8.5 kg)



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



- Camera controller (approx. 8.5 kg)



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