

**HAMAMATSU**

DATA SHEET

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



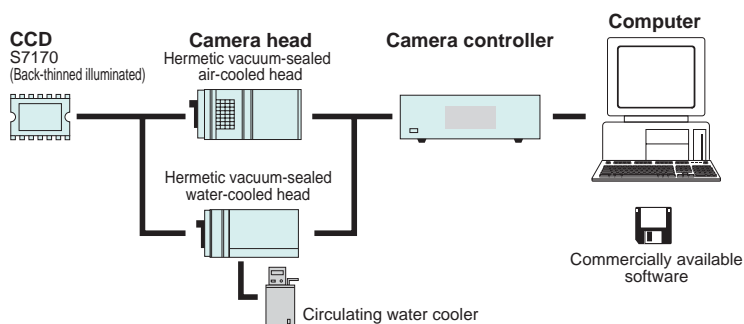
▲ Hermetic vacuum sealed air-cooled head type

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.

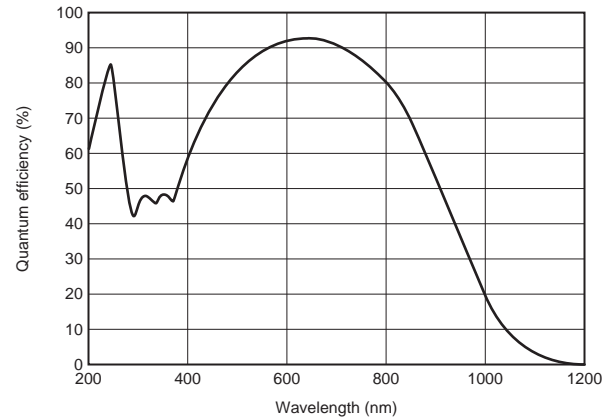
## APPLICATIONS

- 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 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  G

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



Hamamatsu is a member of 1394 Trade Association

# SPECIFICATIONS

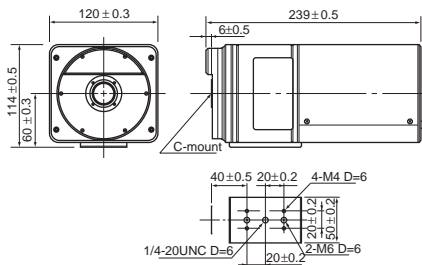
Type number	C4742-98-26LAG	C4742-98-26LWG
Camera head type	Hermetic vacuum sealed air-cooled head	Hermetic vacuum sealed water-cooled head
Circulating water cooler (sold separately)	-	Required
Mechanical shutter	Built-in (Control: OPEN / CLOSE / AUTO)	
Imaging device	S7170 full-frame transfer CCD	
Effective 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	0.5 frame/ sec (High-precision readout) / 6.3 frame/sec (High-speed readout)	
Readout noise (r.m.s.) (High-precision readout) typ.	7 electrons	
Full well capacity typ.	230 000 electrons	
Dynamic range* (High-precision readout) typ.	32 875 : 1	
Cooling method	Forced air peltier cooling, with hermetic sealing	Water-cooling and peltier cooling, with hermetic sealing
Cooling temperature	- 55 °C	- 60 °C
Dark current	0.8 electrons/pixel/s	0.3 electrons/pixel/s
A/D converter (High-precision readout)	16 bit	
Interface / Output signal (High-precision readout)	IEEE 1394-1995 / Non-compressed data (Mono 16)	
Exposure time	20 ms to 7 200 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-precision readout	6.34 frame/s	9.84 frame/s	13.6 frame/s	16.8 frame/s	Frame rate	High-precision readout	9.84 frame/s	13.6 frame/s
	High-speed readout	0.55 frame/s	1.07 frame/s	2.05 frame/s	3.75 frame/s		High-speed readout	1.86 frame/s	5.17 frame/s

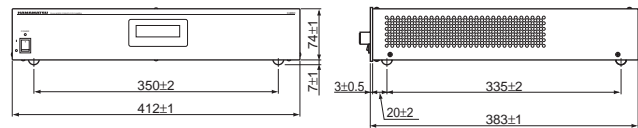
\* Calculated from the ratio of the full well capacity and the readout noise.

## DIMENSIONAL OUTLINES (Unit: mm)

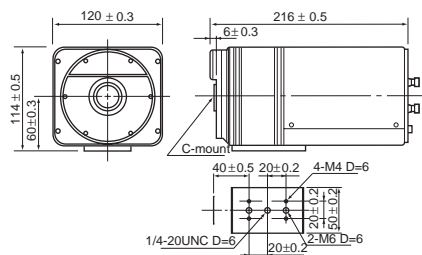
- Hermetic vacuum sealed air-cooled head (approx. 2.5 kg)



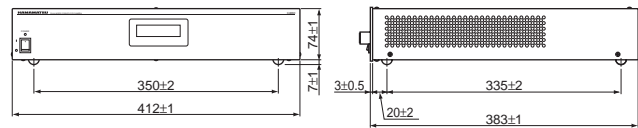
- Camera controller (approx. 8.5 kg)



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



- Camera controller (approx. 8.5 kg)



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