HAMAMATSU

DATA SHEET

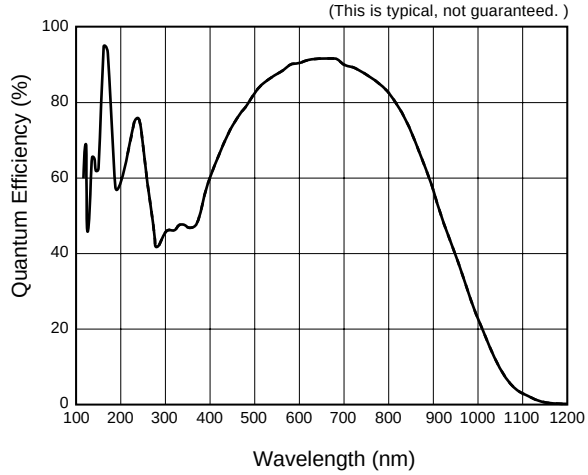
# BT(Back-thinned)-CCD Digital Camera C8000-10




The C8000 camera series employs an ultra high sensitive back-thinned CCD sensor made by Hamamatsu. Especially in the UV, DUV and VUV wavelength ranges, the C8000 series offers extremely high sensitivity never before realized by other scientific CCDs.

Spectral Response Characteristic of CCD chip*

(This is typical, not guaranteed. )




* Without sapphire window. The spectral response with sapphire window is decrease by the transmittance.

## FEATURES

- **Extremely high UV, DUV and VUV sensitivity**
- **Quantum Efficiency of CCD chip**

(This is typical, not guaranteed. ) **Calclated value

| Excimer Laser | | $F_2$ | ArF | KrF |
|---|---|---|---|---|
| Wavelength (nm) | | 157 | 193 | 248 |
| Quantum Efficiency(%) | Without sapphire window | 84 | 57 | 69 |
| | With sapphire window | 34 ** | 42 ** | 55 ** |

- **Low dark noise with peltier cooling**
- **Binning function / Sub-array function**

## APPLICATIONS

- **Beam Diagnostics of Stepper Excimer Lasers: $F_2$ (157 nm), ArF (193 nm), KrF(248 nm)**
- **Development of UV optics**

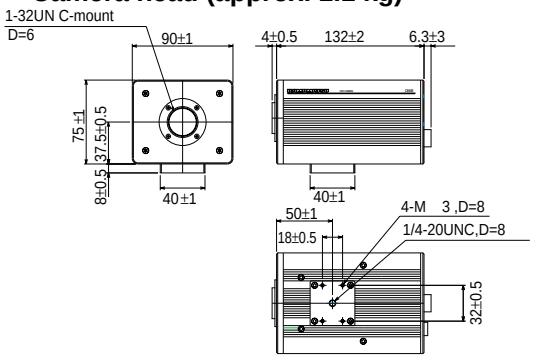
# SPECIFICATIONS

| Model | | C8000-10 |
|---|---|---|
| Imaging device | | Back-thinned frame transfer CCD |
| Effective number of pixels | | 640 (H) × 480 (V) |
| Cell size | | 14 μm (H) × 14 μm (V) |
| Effective area | | 8.96 mm(H) × 6.72mm (V) / 2/3 inch format |
| Readout noise (r.m.s.) | | approx. 100 electrons r.m.s. |
| Full well capacity | | 50,000 electrons (typical value) |
| Dynamic range* | | 500 : 1 |
| Frame rate | Slow scan mode | 7.7Hz, 14.7Hz(2 × 2 binning), 25.8Hz(4 × 4 binning), 40.0Hz(8 × 8binning) |
| | Middle scan mode | 15.4Hz, 29.5Hz(2 × 2 binning), 51.5Hz(4 × 4 binning), 80.6Hz(8 × 8binning) |
| | High scan mode | 30.9Hz, 55.0Hz(2 × 2 binning), 91.7Hz(4 × 4 binning), 131.6Hz(8 × 8binning) |
| Cooling method | | Peltier cooling /natural air cooling |
| Cooling temperature | | +5 ˚C (Cools the CCD element to 20˚C less than the ambient temperature) |
| Dark current | | approx. 135 electrons/pixels/ sec |
| Exposure time | | 1 sec max. (On chip integration) |
| A/D converter | | 12 bit |
| Lens mount | | C-mount |
| Contrast enhancement gain | | Approx. 1 to 5 times |
| Sub-array readout | | 1/1, 1/2, 1/4, 1/8 (H) × 8 pixel unit (V) |
| Super-pixel readout (Binning) | | 2 × 2, 4 × 4, 8 × 8, |
| External trigger input | | Yes |
| Output signal (digital output) | | 16 bit RS-644 LVDS |
| External control | | RS-232C |
| Ambient storage temperature | | -10 to +50˚C |
| Ambient operating temperature | | 0 to +40˚C |
| Ambient storage/operating humidity | | 70% max. (with no condensation) |
| Line voltage | | 100 / 117 / 220 / 240 VAC 50/60Hz |
| Power consumption | | 70VA |

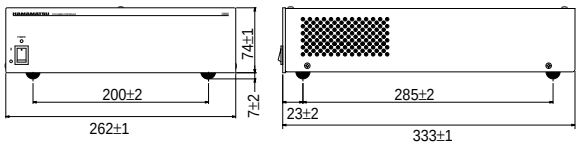
*Calculated from the ratio of the full well capacity and the readout noise.

# DIMENSIONAL OUTLINES (UNIT: mm)

**• Camera head (approx. 1.1 kg)**




**• Camera controller (approx. 5.0 kg)**





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**Homepage Address http://www.hamamatsu.com**

HAMAMATSU PHOTONICS K.K., Systems Division
812 Joko-cho, Hamamatsu City, 431-3196, Japan, Telephone: (81)53-431-0124, Fax: (81)53-435-1574, E-mail:export@sys.hpk.co.jp

*U.S.A. and Canada:* Hamamatsu Photonic Systems: 360 Foothill Road, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1)908-231-1116, Fax: (1)908-231-0852, E-mail: usa@hamamatsu.com
*Germany:* Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-2658, E-mail: info@hamamatsu.de
*France:* Hamamatsu Photonics France S.A.R.L.: 8, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10, E-mail: infos@hamamatsu.fr
*United Kingdom:* Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire, AL7 1BW, U.K., Telephone: (44) 1707-294888, Fax: (44) 1707-325777, E-mail: info@hamamatsu.co.uk
*North Europe:* Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171-41 Solna, Sweden, Telephone: (46)8-509-031-00, Fax: (46)8-509-031-01, E-mail: info@hamamatsu.se
*Italy:* Hamamatsu Photonics Italia S.R.L.: Strada della Mois, 1/E 20020 Arese (Milano), Italy, Telephone: (39)02-935 81 733, Fax: (39)02-935 81 741, E-mail: info@hamamatsu.it



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ООО «НИОКР СИТЕМС»
Москва, 125362, Россия, ул. Вишневая, д. 9, к. 1, Блок 104 а и 104 в

Телефон: 8 (495) 268-14-82
Email: n@nsistems.ru

ИНН: 7735154786
ОГРН: 1167746717709