

**DATA SHEET:**

GE 1024 1024 series

GE 1024 256 series

GE 2048 512 series

**SPECTRAL RANGES:**

Vacuum-Ultraviolet (VUV)

Extreme-Ultraviolet (EUV)

Soft X-ray

Hard X-ray

NIR, VIS, UV

**GE 1024 1024 series**

1056 × 1027 pixels

13.3 mm × 13.3 mm image area

13 μm × 13 μm pixel size

Vacuum flange interface

**GE 1024 256 series**

1024 × 256 pixels

26.6 mm × 6.7 mm image area

26 μm × 26 μm pixel size

Vacuum flange interface

**GE 2048 512 series**

2048 × 515 pixels

27.6 mm × 6.9 mm image area

13.5 μm × 13.5 μm pixel size

Vacuum flange interface

Based on a unique platform concept, greateyes offers a portfolio of scientific cameras with vacuum interface for imaging and spectroscopy in the VUV, EUV, soft- and hard X-ray range. Incoming photons are directly detected by the CCD sensor. Besides the precise measurement of high energy radiation, the detectors exhibit a high sensitivity in the ranges NIR, VIS and UV as well.

All greateyes cameras combine scientific CCD sensors with ultra low noise electronics for optimal detection of weak signals. Select among different spectral sensitivities and flange types to find the best solution for your imaging or spectroscopic application.

Deep cooling of the sensor is achieved by means of multi-stage thermoelectric peltier elements. The cameras provide a rich set of functionalities including flexible binning operation, various trigger and synchronisation modes, software adjustable base line as well as temperature monitoring of the sensor and the heat radiation system.

**Key features**

Compact size	Flexible binning modes	Quantum efficiency up to 98%
Full well capacity up to 700 ke <sup>-</sup>	Software adjustable gain setting	Deep cooling to min. -100°C
Read noise: min. 2.4 e <sup>-</sup>	Temperature monitoring	max. 18 bit dynamic range
Portfolio of about 10 different models	CF or ISO-F interface flanges	greateyes Vision software included
SDK & Labview and EPICS drivers	Ext. trigger, shutter, sync signals	Water and forced air cooling

## SPECIFICATIONS

### Model specifications

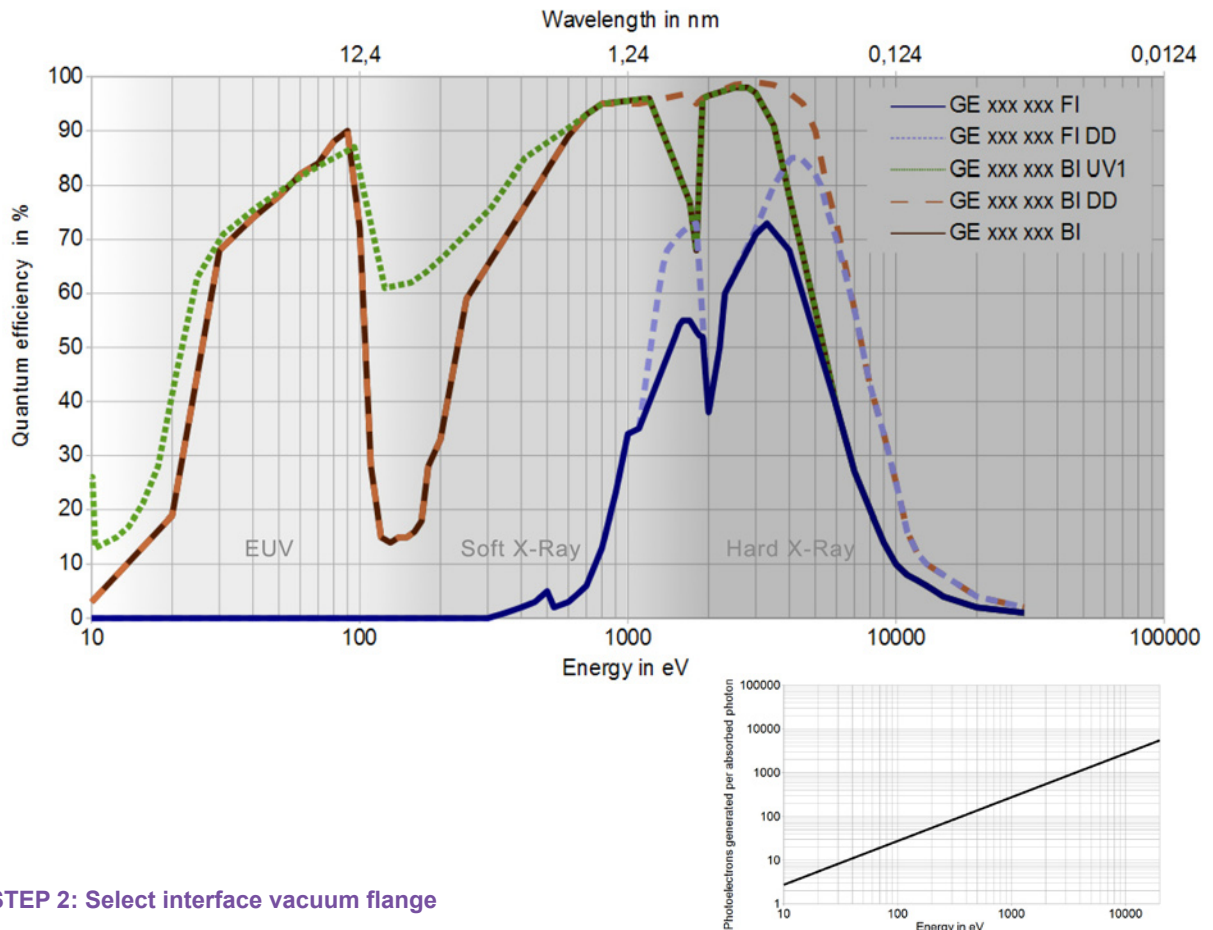
	GE 1024 1024 series	GE 1024 256 series	GE 2048 512 series
Pixel format	1056 × 1027	1024 × 256	2048 × 515
Image area	13.3 mm × 13.3 mm	26.6 mm × 6.7 mm	27.6 mm × 6.9 mm
Pixel size	13 μm × 13 μm	26 μm × 26 μm	13.5 μm × 13.5 μm
Full well capacity	100 ke <sup>-</sup> 120 ke <sup>-</sup> (for DD models)	500 ke <sup>-</sup> 700 ke <sup>-</sup> (for DD models)	100 ke <sup>-</sup>
Register well capacity	150 ke <sup>-</sup>	1 000 ke <sup>-</sup>	150 ke <sup>-</sup>
Dark current @ -80°C	0.0003 e <sup>-</sup> /pixel/sec 0.017 e <sup>-</sup> /pixel/sec (for DD)	0.0005 e <sup>-</sup> /pixel/sec 0.08 e <sup>-</sup> /pixel/sec (for DD)	0.0003 e <sup>-</sup> /pixel/sec
Gain	1 counts/e <sup>-</sup> (high) 0.4 counts/e <sup>-</sup> (low)	1 counts/e <sup>-</sup> (high) 0.2 counts/e <sup>-</sup> (low)	1 counts/e <sup>-</sup> (high) 0.4 counts/e <sup>-</sup> (low)
Max. dynamic range	50 000:1	125 000:1	33 333:1
CCD sensor type	front-illuminated (FI), back-illuminated (BI), deep depletion fringe suppression (DD), enhanced back-illuminated (UV1)		
Blemish specifications	Grade 0 or grade 1 (standard) as specified by sensor manufacturer		

### Common specifications

Pixel readout frequency	500 kHz - 3.0 MHz
AD converter resolution	16 bit, 18 bit optional
Read noise at 500kHz	min.: 2.4 e <sup>-</sup> rms, typical: 4 e <sup>-</sup> rms
Linearity	better than 99%
Vertical shift speed	software selectable max. 100 μs/row
CCD epitaxial thickness	15 μm standard, 40 μm for deep depletion models
Flange types	ISO-F DN63, CF DN63, CF DN100, CF DN160
Vacuum compatibility	with CF DN63, CF DN100: 10 <sup>-8</sup> mbar, with CF DN160: 10 <sup>-9</sup> mbar (UHV capability)
Bakeout temperature	max. +80°C
Distance flange - focal plane	19.6 mm for CF DN 63
CCD sensor cooling	min. -100°C to 20°C, forced air or water cooling
Temperature monitoring	CCD sensor and thermoelectric cooler (hot side)
Data link	USB, Gigabit-Ethernet
Software	greateyes Vision software for Windows XP / Vista / 7 / 10
SDK and drivers	DLL for Windows XP / Vista / 7 / 10; LabVIEW, EPICS, Linux driver
TTL interface signals	Sync out, shutter out, external trigger in
Operating conditions	temperature: 0°C to 30°C ambient, relative humidity <70% (non condensing)
Power supply	110-240 VAC, 50 Hz-60 Hz, max. 1A
Certification	CE
Dimensions	6.2 cm (2.44") × 8.7 cm (3.43") × 12.3 cm (4.84") (W × H × L) camera body
Weight	2 300 g (camera with CF DN63 flange)

### STEP 1: Choose camera model by order code

	GE 1024 1024 series	GE 1024 256 series	GE 2048 512 series
High sensitivity in the VUV, EUV, soft- and hard X-ray range	GE 1024 1024 FI GE 1024 1024 BI GE 1024 1024 BI UV1 GE 1024 1024 BI DD	GE 1024 256 FI GE 1024 256 FI DD GE 1024 256 BI UV1 GE 1024 256 BI DD	GE 2048 512 FI GE 2048 512 BI GE 2048 512 BI UV1



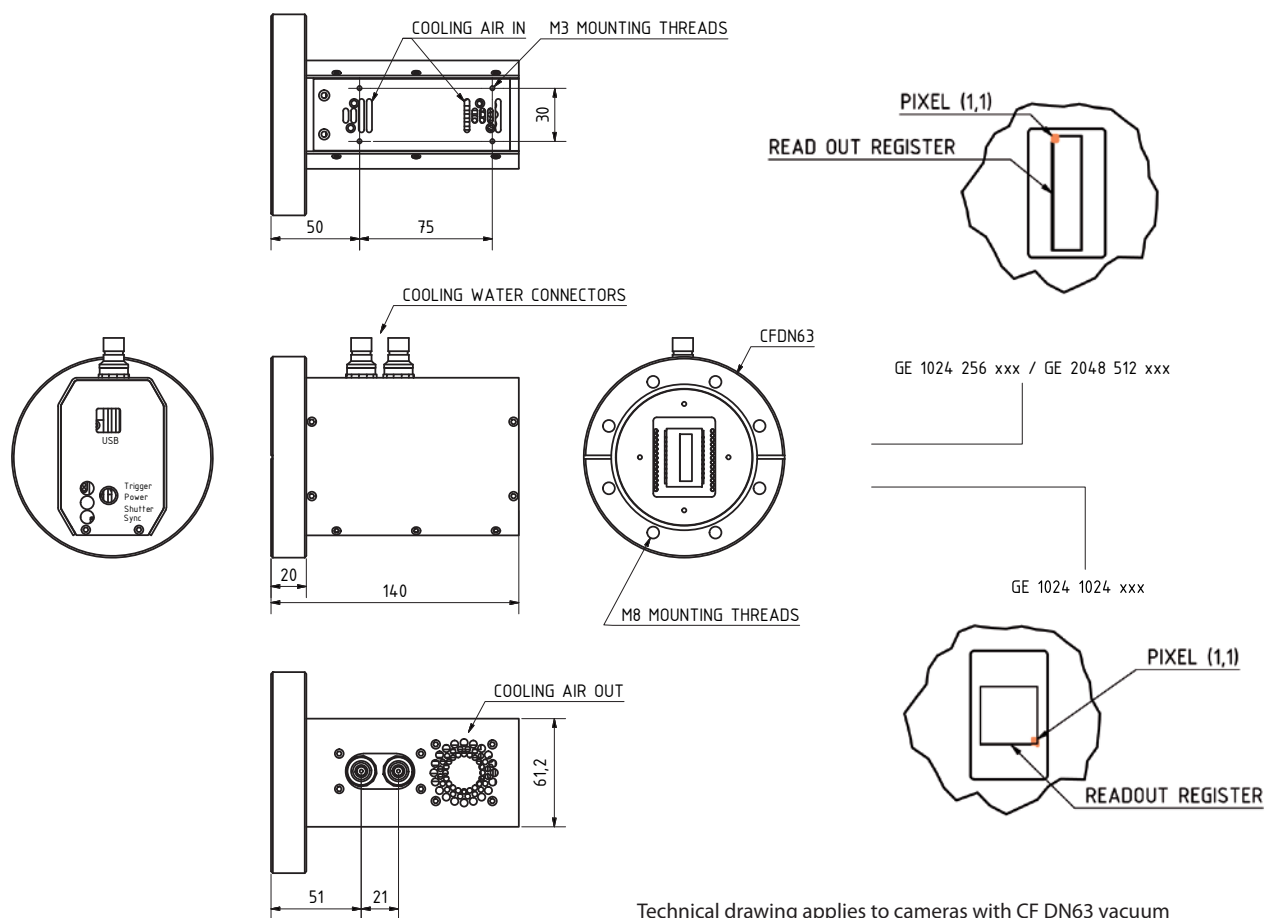
### STEP 2: Select interface vacuum flange

Order code	Description
camera order code + IS1	Quick release flange ISO-F DN63 with through holes
camera order code + CF4 / CF5	Knife edge sealed CF DN63 / CF DN100 flange with threaded / through holes
camera order code + CF6	Knife edge sealed CF DN160 flange. An integrated pumping pipe with CF DN40 flange allows differential separate pumping of sensor area for UHV designs.

### STEP 3: Choose accessories and software

Order code	Description
<b>A) Subpixel resolution enhancement</b>	
<b>New</b> GE-S xxx xxx series	Increased spatial resolution (See scientific superresolution camera data sheet for details)
<b>B) Software development kit (SDK) and drivers</b>	
GE-CR01	Compact recirculator operating at room temperature for deep camera cooling
GE-CR02	Recirculating water chiller, temperature range -5°C to 30°C for ultra deep camera cooling
<b>C) Software development kit (SDK) and drivers</b>	
GE-SDK01	SDK for Windows and Linux compatible with C/C++, Delphi, Labview
GE-LAB01	Labview driver
GE-EP	EPICS driver
GE-LX01	Linux driver

## TECHNICAL DRAWINGS



## Items delivered together with each camera

GE-VI01	greateyes Vision software suite for Windows
GE-StoB2m	2m SMB to BNC connection cable
GE-USB5m	5m USB 2.0 cable type A to type B
GE-POW01	camera power supply with cabling
GE-ManCam	camera instruction manual on CD

## CONTACT INFORMATION

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