

BioContinuum Imaging Filter

Model 1067

The BioContinuum® imaging filter combines the latest generation in electron optics with a transformative direct detection system that streamlines single-particle imaging and studies of cellular organization and ultrastructure. Ideally suited for low-dose imaging applications, the BioContinuum is optimized for cryo-electron microscopy (cryo-EM) and cryo-electron tomography (cryo-ET) to gain further insight into system function and disease progression at the molecular level.

Benefits

- **Highest DQE available:** Confidently detect smaller particles, distinguish conformational changes, perform cryo-ET at a lower dose, and preserve higher-resolution information for 3D reconstruction
- **Intelligent tuning:** Use smart algorithms to speed up and streamline optics alignment for both novice and expert users
- **1,500 full frames per second:** Acquire 3.75 times the speed of the GIF Quantum® LS imaging filter
- **24-megapixels field of view:** Capture 1.6 times the size of the GIF Quantum® LS imaging filter
- **Lowest image distortion:** Utilize the Continuum's cutting-edge optics to reduce image distortion while maximizing the available imaging area with the K3® direct detector
- **EELS and EFTEM compatible:** Add electron energy loss spectroscopy (EELS) and energy-filtered transmission electron microscopy (EFTEM) support to expand the functionality of the BioContinuum HD

The BioContinuum continues to lead the resolution revolution with the highest detective quantum efficiency (DQE) available. Using the K3's pioneering direct detection with an innovative correlated double sampling (CDS) algorithm, the BioContinuum removes inelastically scattered electrons to improve the signal-to-noise ratio in thick samples and enable you to see smaller particles more easily.

Combined with next-generation electron optics, the BioContinuum further minimizes any distortion from the imaging system to deliver the clearest, most accurate image of any energy filter available.

The BioContinuum guarantees optimal results with fully automated alignment routines that make filter tuning faster and

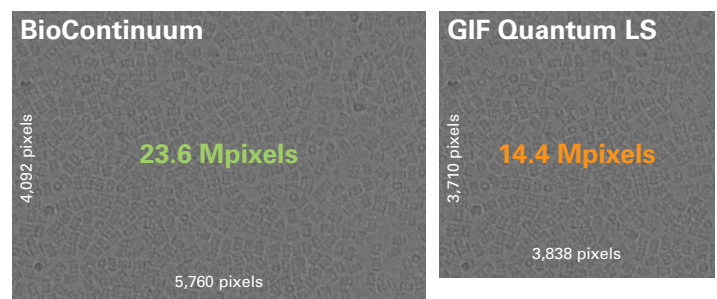
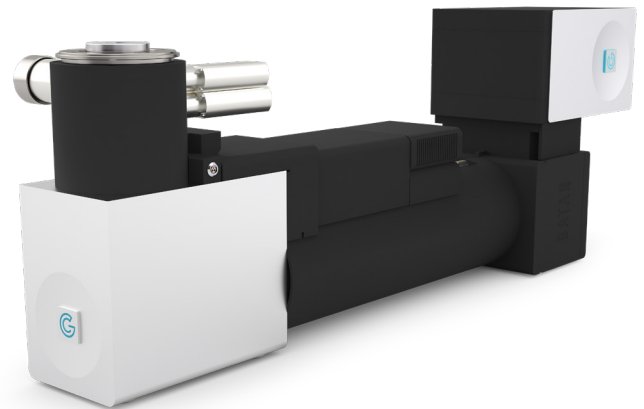


Figure 1. At 23.6 megapixels (Mpixels), BioContinuum provides 1.65 times the throughput of the GIF Quantum LS imaging filter (pixels/frame).

easier for both novice and expert users. With a single click, smart algorithms shorten the time to fully tune your filter and deliver reproducible results across your short- and long-term studies. Furthermore, the system uses automated zero-loss tuning routines to condense the time necessary to touch-up the image alignment.

Using a maximum frame rate of 1500 full frames per second (fps), this technology recognizes and counts individual image electrons in real-time. Unlike conventional direct detection capture speeds the BioContinuum's high-speed capture rate minimizes coincidence loss to deliver the highest-resolution, single-electron counted images available.

The detector's high frame rate is ideal for capturing high-resolution information before a specimen's structural integrity is damaged due to electron beam irradiation. While exposing a specimen to a typical dose of 10 – 30 e⁻/Å², the significantly

Specifications

Model number	1067	1067HD
Detector performance		
Sensor size (pixels)	5,760 x 4,092	
Readout modes	Counting Super-resolution	
Max. image size (pixels)	11,520 x 8,184 Super-resolution	
Sensor read-out (full fps)	>1500	
File formats	*.dm4, *.hdf5, *.mrc, *.tiff All electron events are counted, accessible, and stored to disk	
Transfer speed to computer, super-resolution, 8-bit (full fps)	>75	
Motion correction	Inline	
Gatan Microscopy Suite® software	Included	
Automation support	Latitude and other third-party software	
Filter performance		
Filter electron optics	GIF Continuum® energy filter	
Entrance aperture size (mm)	9	
Magnification (entrance aperture to detector)	<6x	
Alignment mask pattern (W x H)	9 x 7	
ZLP tuning frequency and duration	Daily, <1 min	
ZLP stability (eV/24 h)	<±5	<±2
Slit width min. (eV)	5	3
Image distortion max. (%)	<0.5	<0.2
Chromatic distortion max. (%)	<0.5	<0.1
Non-isochromaticity max. (eV)	<2.7	<1.0
Electronics temperature sensitivity (eV/K)	<1.0	<0.5

Specifications are subject to change without notice.

Applications

- Single-particle cryo-EM
- Cryo-tomography
- Beam-sensitive materials
- EELS and EFTEM (option on 1067HD)

shorter exposure time allows you to collect the same number of images 3.75 times faster than GIF Quantum LS imaging filter.

Using a guided workflow in the powerful Latitude® single-particle software, the BioContinuum simplifies the setup and automation of multi-region experiments to improve the throughput of your 3D cryo-EM studies. Complemented by tracking algorithms for specimen motion correction, the BioContinuum more accurately compensates for specimen motion and drift to enhance your single-particle imaging and cryo-ET results.

Ordering

Model	Description
1067	BioContinuum Imaging Filter
1067HD	BioContinuum HD Imaging Filter
1067.2U	K3 to BioContinuum Upgrade
1067.3U	HD Upgrade for BioContinuum
1067.EE	EELS Support (BioContinuum HD)
1067.EF	EFTEM Support (BioContinuum HD)
1025.GPU	GPU Upgrade for K3 Camera
1067.Beamstop	Beamstop Upgrade for BioContinuum

Other products to consider

- K3 Direct Detection Camera
- Elsa™ Cryo-Transfer Holder
- Latitude S Single-Particle Software
- Solarus® II Plasma Cleaner

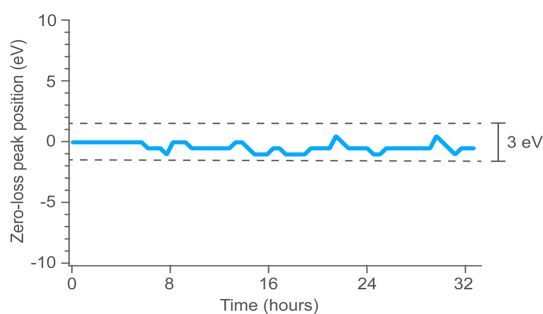


Figure 2. Advanced electron optics and system electronics result in a highly stable ZLP allowing for extended data collection sessions.

