

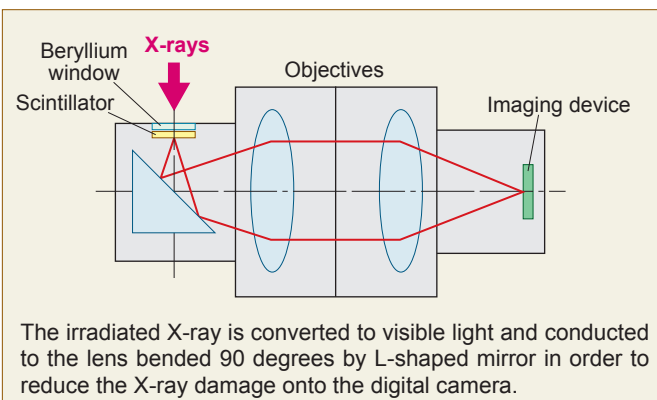
High Resolution X-ray Imaging System



▲M11427-62 (Camera: ORCA-Flash4.0 V3)

The high resolution X-ray imaging system is designed for the application of X-ray beam alignment. Adopting unique mechanism, it enables to combine various type of cameras for real time X-ray beam alignment. Beryllium input window realized wide range of X-ray energy and coupled with L-shaped quartz optics makes high X-ray radiation tolerance. Suitable for high resolution X-ray beam alignment in large synchrotron radiation facilities.

PRINCIPLE



FEATURES

- **X-ray proof design**
(adopting a quartz glass plate and L-shaped optics)
- **Easy to exchange scintillators**
- **Possible to detect low X-ray energy**
- **Small size and light weight**
- **Remote controllable focus adjustment**
- **One touch design for camera attachment**
- **High resolution**

APPLICATIONS

- **X-ray CT**
- **Phase contrast X-ray CT**
- **X-ray optics alignment**
- **X-ray topography**
- **X-ray microscope**
- **Angiography**
- **XAFS**

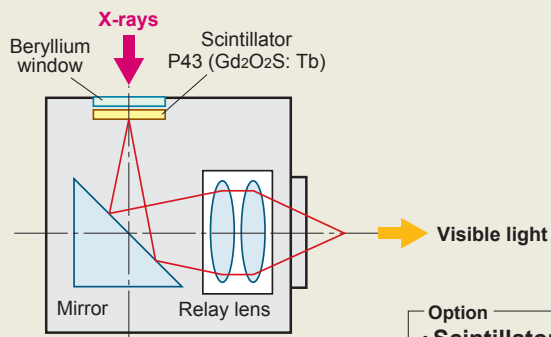
M11427-41, -42 (Standard type)

High resolution X-ray imaging system AA40

- Resolution: 10 μm
- Scintillator diameter: 17 mm



PRINCIPLE



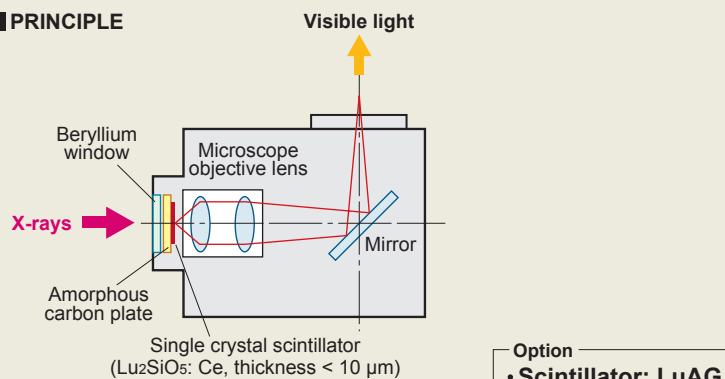
M11427-51, -52, -53 (Small area type)

High resolution X-ray imaging system AA50

- Resolution: 2 μm
- Scintillator diameter: 10 mm



PRINCIPLE



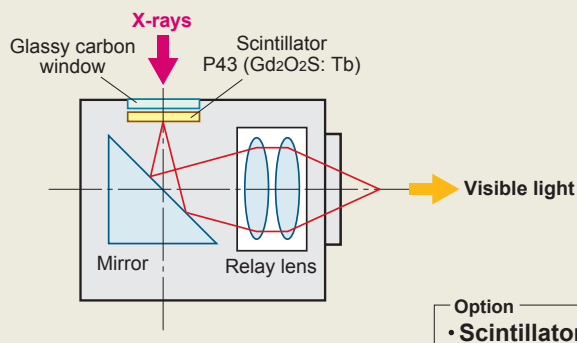
M11427-62 (Large area type)

High resolution X-ray imaging system AA60

- Resolution: 10 μm or more
- Scintillator diameter: 35 mm



PRINCIPLE



SPECIFICATIONS

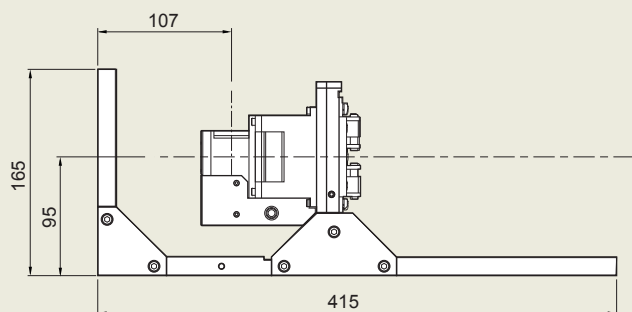
Type number	M11427-41	M11427-42	M11427-51	M11427-52	M11427-53	M11427-62
Imaging unit	AA40		AA50			AA60
Scintillator diameter	17 mm		10 mm			35 mm
Input window material	Beryllium (0.5 mm)		Beryllium (0.5 mm) / Amorphous carbon (2 mm)			Glassy carbon (0.5 mm)
Sensitivity range	3 keV or more		3 keV or more			6 keV or more
Scintillator material	P43 (Gd ₂ O ₂ S: Tb)		LSO (Lu ₂ SiO ₅ : Ce)			P43 (Gd ₂ O ₂ S: Tb)
Peak emission wavelength	540 nm		420 nm			540 nm
Minimum thickness of scintillator	10 μm		10 μm			10 μm
Substrate material of scintillator	Quart glass		Amorphous carbon plate			Quart glass
Resolution *	10 μm		4 μm	2 μm	1 μm	10 μm or more
10 % Decay time	1 ms		40 ns			1 ms
First lens	24 mm	50 mm (F1.4)	10× (NA 0.3)	20× (NA 0.4)	50× (NA 0.55)	75 mm (F2.8)
Second lens	105 mm, 50 mm, 35 mm			-		105 mm, 50 mm, 35 mm
ND filter	ND10 / ND1			-		ND10 / ND1

* Depending on the camera type

DIMENSIONAL OUTLINES (Unit: mm)

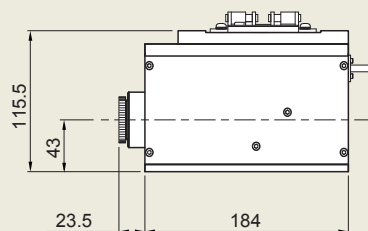
● High resolution X-ray imaging system AA40

(Approx. 5.2 kg)



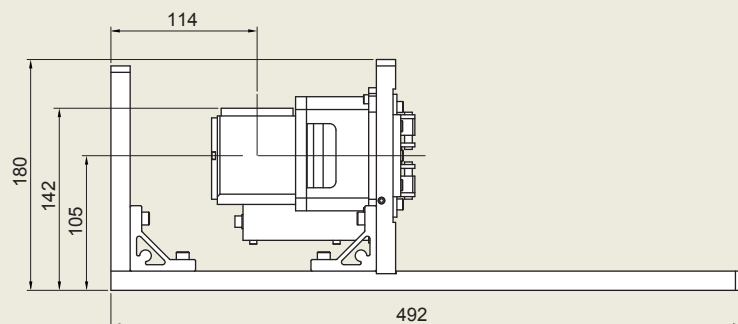
● High resolution X-ray imaging system AA50

(Approx. 3.7 kg)



● High resolution X-ray imaging system AA60

(Approx. 7.5 kg)



Camera selection

ORCA®-Flash4.0 V3

High speed, High resolution,
Low readout noise



Field of view	Camera lens (f=50 mm)	Field of view
M11427-42 (f=50 mm)	13.3 mm × 13.3 mm	
M11427-52 (20×)	0.665 mm × 0.665 mm	
M11427-62 (f=75 mm)	19.95 mm × 19.95 mm	

ImagEM® X2-1K

High sensitivity



Field of view	Camera lens (f=50 mm)	Field of view
M11427-42 (f=50 mm)	13.3 mm × 13.3 mm	
M11427-52 (20×)	0.665 mm × 0.665 mm	
M11427-62 (f=75 mm)	19.95 mm × 19.95 mm	

*Pictures show camera and camera lens. *The field of view is based on calculation. Actual field of view may be different from the calculated values.

SPECIFICATIONS

Camera type number	ORCA-Flash4.0 V3 (C13440-20CU)		ImagEM X2-1K (C9100-24B)	
Imaging device	Scientific CMOS image sensor		Electron multiplying back-thinned frame transfer	
Effective number of pixels	2048 (H) × 2048 (V)		1024 (H) × 1024 (V)	
Cell size	6.5 μm (H) × 6.5 μm (V)		13 μm (H) × 13 μm (V)	
Effective area	13.3 mm (H) × 13.3 mm (V)		13.3 mm (H) × 13.3 mm (V)	
Full well capacity	30 000 electrons		400 000 electrons (EM-CCD mode)	
Readout speed	100 frames/s (Camera Link), 40 frames/s (USB 3.0)		18.5 to 314 frames/s	
Readout noise (rms)	EM 10×	-	3 electrons (0.6875 MHz)	
	EM 1200×	-	1 electron max. (0.6875 MHz)	
	Normal	1.4 electrons (slowscan)	10 electrons (0.6875 MHz)	
Dark current	Air cooled	0.06 electrons/pixel/s (-10 °C)	0.01 electrons/pixel/s (-50 °C)	
	Water cooled	0.006 electrons/pixel/s (-30 °C)	0.001 electrons/pixel/s (-70 °C)	
Cooling method	Forced air	Water cooled	Forced air	Water cooled
Cooling temperature	-10 °C (Ambient temperature: +20 °C)	-30 °C (Water temperature: +15 °C)	-50 °C (Ambient temperature: 0 °C to +30 °C)	-70 °C (Water temperature: +20 °C)
Digital output	16 bit		16 bit	
Interface	Camera Link full configuration Deca mode / USB 3.0		IEEE1394b	

*Refer to the camera catalog for detail information.

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