

## PIXIS-XO: 2048B

2048 x 2048 imaging array | 13.5 x 13.5  $\mu\text{m}$  pixels



The Princeton Instruments PIXIS-XO: 2048B is a fully integrated, innovative imaging system that utilizes a CCD without AR coating for very low energy X-ray detection. With 2048 x 2048, 13.5  $\mu\text{m}$  pixels, 100% fill factor, deep thermoelectric cooling with air or water and low noise electronics this system is ideal for worry-free operation in research and OEM environments. The rotatable conflat flange with high-vacuum interface design, software-selectable gains and readout speeds make the camera well suited for ultra-high vacuum applications.

**Applications:** X-ray imaging, X-ray microscopy, EUV lithography, X-ray plasma diagnostics

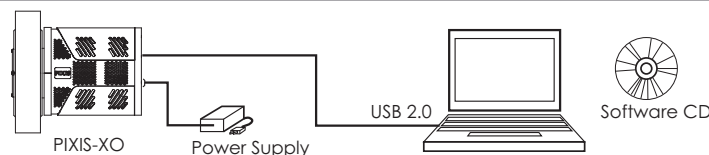
### Features

### Benefits

Back-illuminated CCD, no AR coating, direct detection technology	Provides very low X-ray flux and energy imaging, high sensitivity and high spatial resolution
2 Mhz / 16-bit readout 100 kHz / 16-bit readout	High speed readout for rapid image acquisition Slow speed readout for high sensitivity with wide dynamic range, high signal-to-noise ratio (SNR) and excellent energy resolution
Software selectable gains for each digitization speed	Allows optimization of system performance for lowest noise to highest SNR
2048 x 2048 image area, 13.5 x 13.5 $\mu\text{m}$ pixels	Imaging area designed for large field of view imaging
Ultra low noise electronics	Best possible system performance
Flexible user selectable binning and readout	Total flexibility to optimize experiments and SNR
Deep thermoelectric air cooling	Maintenance-free operation without the need for a liquid circulator or an additional power supply
Conflat vacuum interface	Industry-standard, high-vacuum compatibility
TTL input and output	External Trigger input with programmable polarity TTL output with exposure or readout monitor
"USB 2.0 interface" configuration	Seamless, plug-and-play connection to PC notebooks and desktops Easy OEM integration
WinView and PVCAM <sup>®</sup>	Offers powerful, easy-to-use set of Windows <sup>®</sup> GUI controls Automates data acquisition, analysis, and display
Linux <sup>®</sup> drivers and SITK <sup>™</sup> plug-in for National Instruments' LabVIEW <sup>™</sup>	Extends system utility

### Readout Rates

Binning	@ 2 MHz	@ 100 kHz
1 x 1	2.265 msec	36.45 sec
2 x 2	959 msec	9.521 sec
4 x 4	458 msec	2.595 sec



## PIXIS-XO: 2048B Specifications

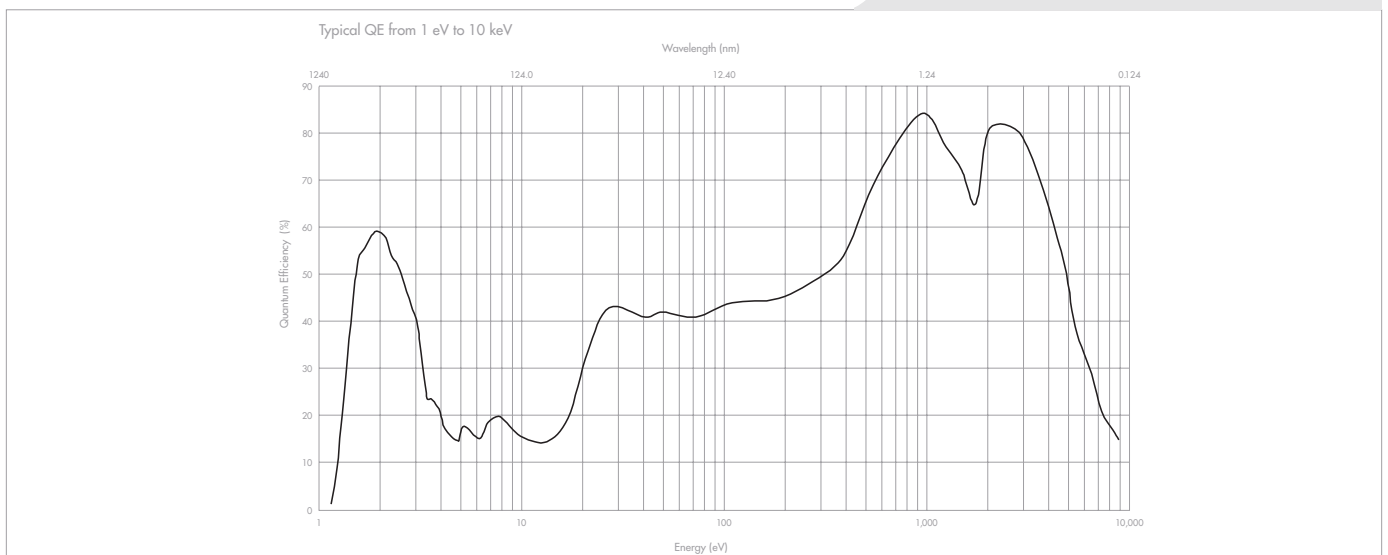
CCD image sensor	E2V CCD 42-40; scientific grade 1; MPP; back-illuminated device; without AR coating			
CCD format	2048 x 2048 imaging pixels 13.5 x 13.5 $\mu\text{m}$ pixels 100% fill factor 27.6 x 27.6 mm imaging area (optically centered)			
	Minimum		Typical	
System read noise @ 100 kHz digitization @ 2 MHz digitization			3.5e- rms 12 e- rms	
Single-pixel full well	80 ke-		100 ke-	
Output amplifier	Low Noise	High Capacity	Low Noise	High Capacity
	100 ke-	800 ke-	150 ke-	1000 ke-
Dark current @ -60°C operation <i>with ambient air @+20°C</i>			0.008 e-/p/s	
Maximum			5 e- rms 16 e- rms	
Cooling Method	Thermoelectric Air (standard); Water cooled (optional)			
Deepest cooling temperature TE air cooling* <i>with ambient air @+20°C</i>	-55°C (with air)		-65°C	
Thermostating precision	$\pm 0.05^\circ\text{C}$ across entire temperature range			
Software-selectable gains (e-/count)	1, 2, 4 (low noise output); 3.5, 7, 14 (high capacity output)			
Operating system support	Windows 2000/XP; Linux			
Data interface	USB2.0 (5m interface cable provided) Optional Fiberoptic interface is available for remote operation			
I/O signals	Two MCX connectors for programmable frame readout, shutter trigger in			
Certification	CE			
Nonlinearity @100 kHz	< 2%			
Vertical shift rate	32.2 $\mu\text{sec}$ per row			
Readout bits / speed	16 bits @ 100 kHz and 2 MHz			
Operating environment	+5 to +30°C non-condensing			
Bakeout temp.	70°C (max)			
Vacuum compatibility**	10 <sup>-8</sup> Torr.			

Notes: All specifications subject to change.

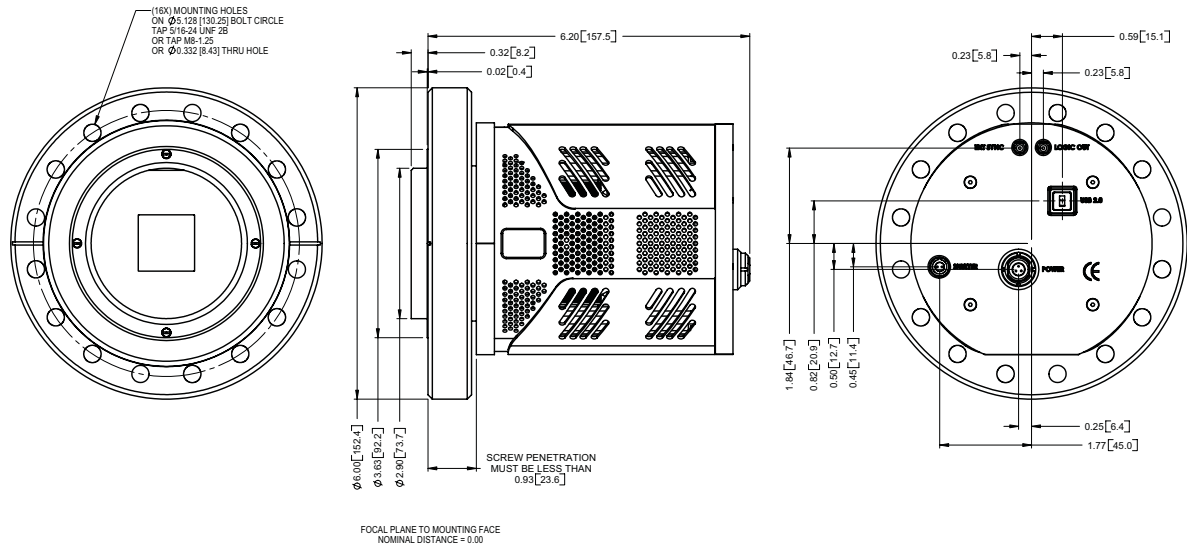
\* The minimum temperature attainable is dependent on the vacuum condition (can be lowered with lower vacuum).

\*\* Better Vacuum compability can be achieved with dynamic pumping.

## Quantum Efficiency Curve

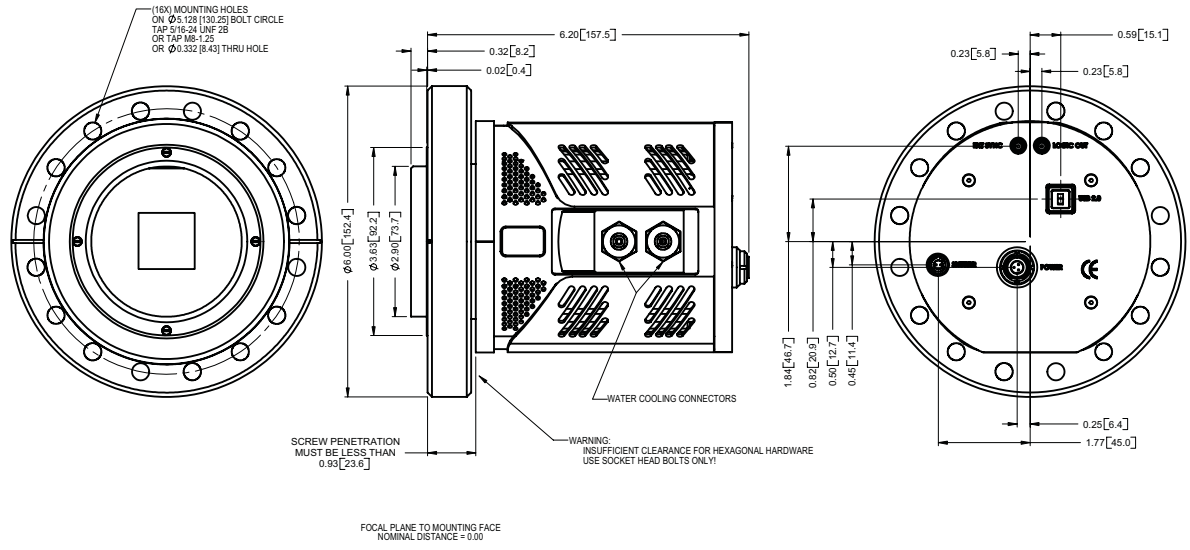


Air Cooled



- NOTES:
1. WEIGHT: 8.0 LBS.
  2. POWER DISSIPATION: 80 WATTS AT FULL POWER.
  3. AIRFLOW: 24CFM FAN CAPACITY AT FULL POWER.

Water Cooled



- NOTES:
1. WEIGHT: 8.0 LBS.
  2. POWER DISSIPATION: 80 WATTS AT FULL POWER.



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