



The Princeton Instruments/Acton PIXIS-XO: 400B is a fully integrated, innovative imaging system that utilizes a CCD without AR coating for very low energy x-ray detection. With 1340 x 400, 20  $\mu\text{m}$  pixels, 100% fill factor, deep thermoelectric cooling with air and low noise electronics this system is ideal for worry-free operation in research and OEM environments. The Conflat flange with high-vacuum-seal design, software-selectable gains and readout speeds make the camera well suited for ultra-high vacuum applications.

**Applications:** X-ray spectroscopy, EUV lithography, X-ray plasma diagnostics



Features	Benefits
Back illuminated CCD, no AR coating, direct detection technology	Provides very low x-ray flux 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
1340 x 400 image area, 20 x 20 $\mu\text{m}$ pixels	Spectroscopy format designed for high-frame-rate 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 inout 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®	Offers powerful, easy-to-use set of Windows® GUI controls Automates data acquisition, analysis, and display
Linux® drivers and SITK™ plug-in for National Instruments' LabVIEW™	Extends system utility



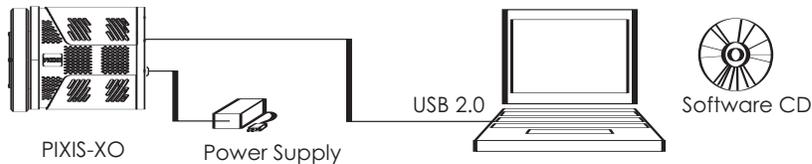
## PIXIS-XO: 400B Specifications

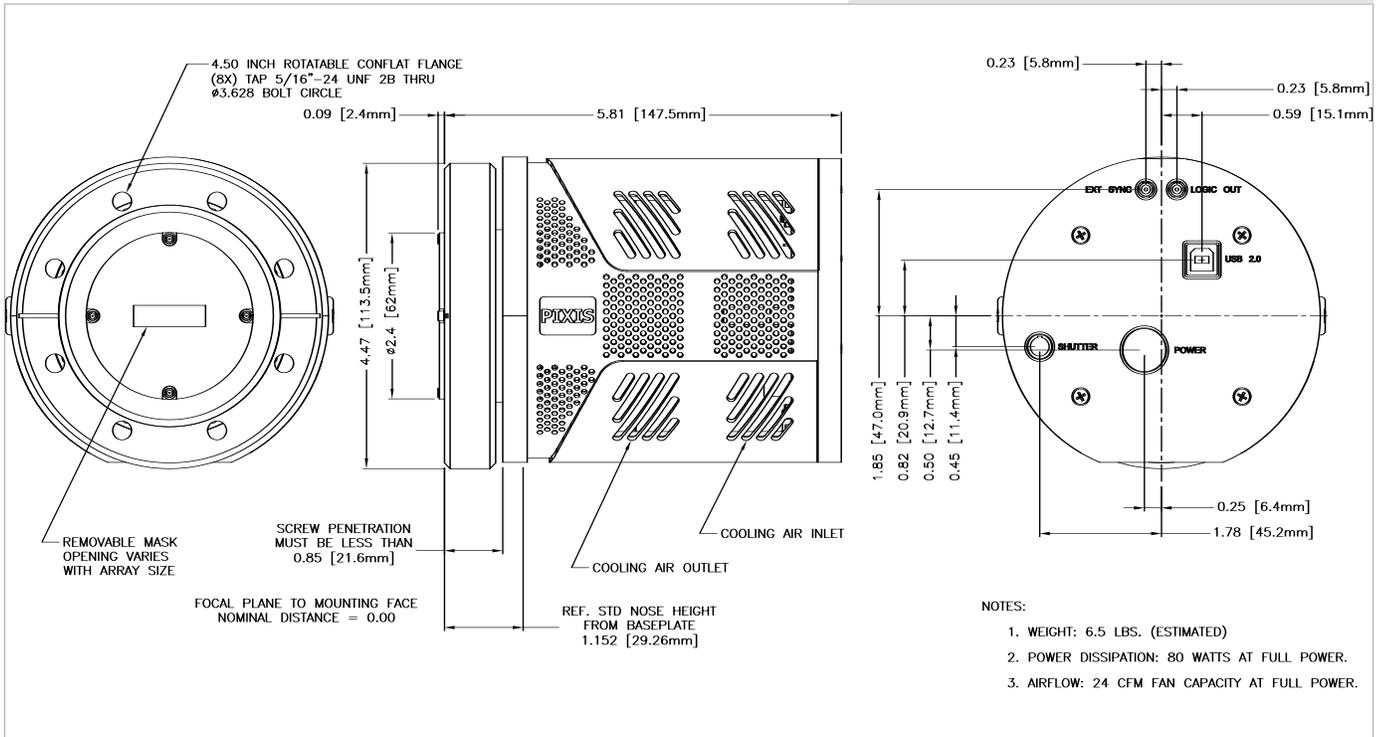
CCD image sensor	Princeton Instruments elcusive; scientific grade 1; MPP; back-illuminated device; without AR coating					
CCD format	1340 x 400 imaging pixels 20 x 20µm pixels 100% fill factor 26.8 x 8.0-mm imaging area (optically centered)					
	Minimum		Typical		Maximum	
	High Sensitivity	High Capacity	High Sensitivity	High Capacity	High Sensitivity	High Capacity
System read noise @ 100-kHz digitization @ 2-MHz digitization			3.5 e- rms 13 e- rms	10 e- 25 e-	5 e- rms 16 e- rms	12 e- 30 e-
Spectrometric well capacity	250 ke-	800 ke-	300 ke-	300 Me-		
Dark current @ -75°C operation			0.005 e-/p/s		0.01 e-/p/s	
Deepest cooling temperature	-70°C		-75°C			
Thermostating precision	±0.05°C across entire temperature range					
Software-selectable gains (e-/count)	1, 2, 4 (high sensitivity mode) 4, 8, 16 (high capacity mode)					
Dynamic range	16 bits					
Nonlinearity	<1% @100 kHz, <2% @ 2 MHz					
Vertical shift rate	30 µsec per row					
Spectral rates* @ 100 kHz digitization @ 2 MHz digitization	35 Hz 74Hz					
Operating environment	+5 to +30°C non-condensing					

Notes: All specifications subject to change.  
 \* Spectral rates measured with all rows vertically binned.  
 \* The minimum temperature attainable is dependent on the vacuum condition (can be lowered with lower vacuum).

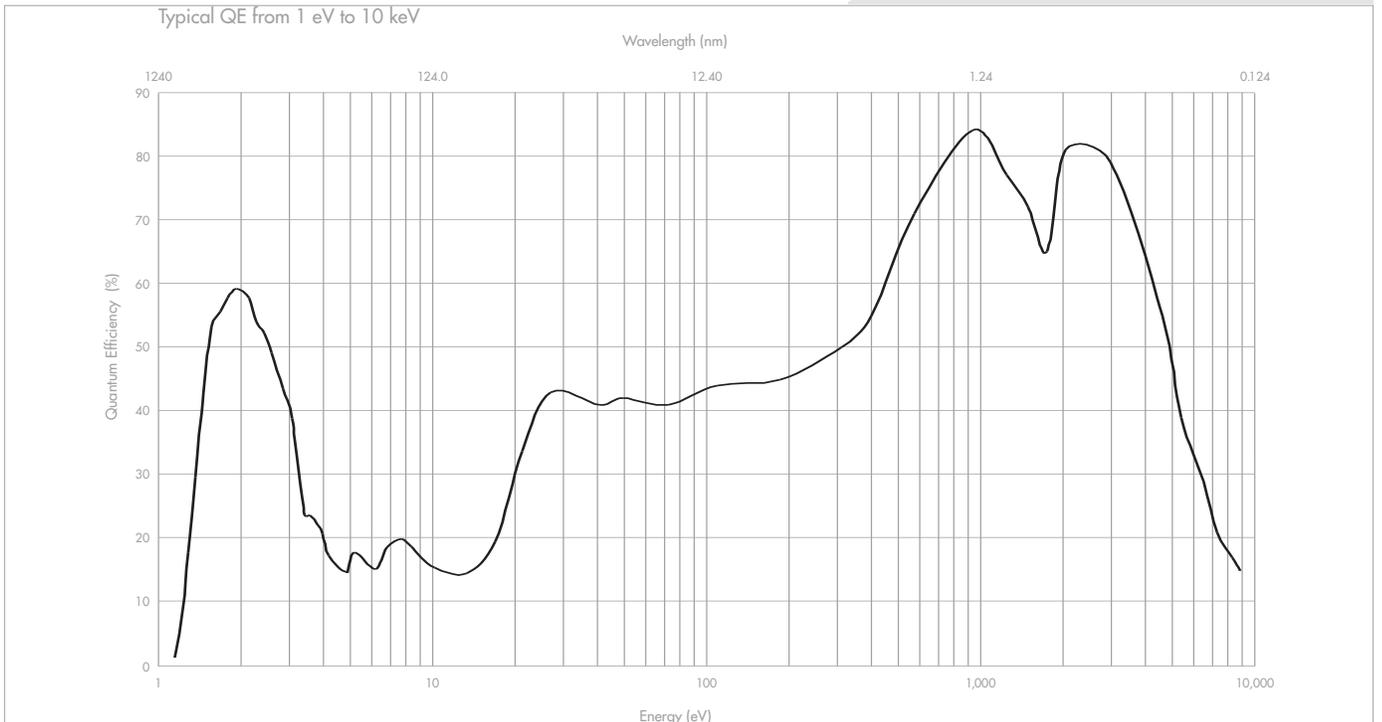
## Readout Rates

Binning	@ 2 MHz	@ 100 kHz
1 x 1	284.1 msec	5.15 sec
2 x 2	135 msec	1.36 sec
1340 x 1	13.44 msec	27.28 msec





Quantum Efficiency Curve



Princeton Instruments



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