TELEDYNE
PRINCETON INSTRUMENTS
Everywhereyoulook™

Part of the Teledyne Imaging Group

PIXIS-XO: 400B

1340 x 400 imaging array | 20 x 20 µm pixels | Direct detection

The PIXIS-XO series of fully integrated imaging cameras utilizes back-illuminated (BI) and back-illuminated, deep-depletion (BR) CCDs without AR coating, for direct detection of the widest range of X-rays between ~ 10 eV and 30 keV (AR coated devices are not useful for X-ray energies < 500eV). With a 1340 x 400 imaging array, 20 µm pixels, 100% fill factor, low noise electronics and -90° C thermoelectric cooling with either air or water, this system is ideal for worry-free operation in research and OEM environments. The rotatable conflat flange with high-vacuum-seal design, software selectable gains and readout speeds make these cameras well suited for ultra-high vacuum applications.

FEATURES	BENEFITS
Back-illuminated deep depletion and back-illuminated CCD, with no AR coating	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 µm pixels	Spectroscopy format designed for high frame rate imaging
Ultra low noise electronics	Best possible system performance
Flexible user-selectable binning & readout	Total flexibility to optimize experiments and SNR
Kinetics	Custom readout mode offers microsecond resolution
Deep thermoelectric air cooling	Maintenance-free operation - NO need for a liquid circulator or additional power supply
Deep thermoelectric water cooling	Vibration free operation
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	Seamless, plug-and-play connection to PC notebooks & desktops; Easy OEM integration
Optional: LightField® (for Windows 10/8/7, 64-bit) **Or WinView/Spec** (for Windows 8/7/XP, 32-bit)	Flexible software packages for data acquisition, display and analysis with built in math engine; LightField offers intuitive, cutting edge user interface and more.
PICAM (64-bit) / PVCAM (32-bit) software development kits (SDKs)	Compatible with Windows 10/8/7 (64-bit), and Linux (contact factory for an update) Universal programming interfaces for easy custom programming.
LabView® Scientific Imaging ToolKit (SITK™)	Predefined VIs for easy integration of camera controls into large experiment

Applications:

X-ray Spectroscopy, EUV Lithography and X-ray Plasma Diagnostics

Teledyne Princeton Instruments | Main Office- (USA) | Tel: +1 609.587.9797 | www.princetoninstruments.com | pi.info@teledyne.com

SPECIFICATIONS

	PIXIS-XO: 400B	PIXIS-XO: 400BR
CCD Image Sensor	Princeton Instruments exclusive; scientific-grade 1; MPP; back-illuminated (BI); no AR coating (B) for sensitivity between ~10 eV to 20 keV.	Princeton Instruments exclusive; scientific-grade 1; NIMO; back-illuminated deep-depletion (BR); no AR coating for sensitivity between ~10 eV to 30 keV.
Dark current @ -75° C (with ambient air @ +20° C)	0.001 e-/p/sec (typical) 0.005 e-/p/sec (max)	0.03 e-/p/sec (typical) 0.065 e-/p/sec (max)
CCD format	1340 x 400 imaging pixels; 20 x 20 μm pixels; 100% fill factor; 13.3 x 13.3 mm (optically centered)	
Deepest cooling temperature, TE air cooling* (with ambient air @ +20° C)	-90° C typical; -75° C guaranteed	
Thermostating precision	±0.05° C	
Cooling method	Thermoelectric air or liquid cooling (CoolCUBE II required)	
Full well	Single pixel: 100 ke- (typical), 60 ke- (minimum) High Sensitivity node: 250 ke- (typical), 220 ke- (minimum) High Capacity node: 1000 ke- (typical), 750 ke- (minimum)	
ADC speed/bits	100 kHz/16-bit and 2 MHz/16-bit	
System read noise @100 kHz @2 MHz	3.0 e- rms (typical), 5 e- rms (max) 11 e- rms (typical), 16 e- rms (max)	
Vertical shift speed	<15 μsec/row (programmable)	
Non-linearity	<1% @ 100 kHz <2% @ 2 MHz	
Software selectable gains	1, 2, 4 e- (high sensitivity); 4, 8, 16 e- (high capacity); available at all speeds	
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	
Operating environment	+5° C to +30° C non-condensing	
Bakeout temperature	70° C (maximum)	
Vacuum Compatibility	10^{-8} Torr	
Certification	CE	
Dimensions / Weight	16.59 cm (6.53") x 11.81 cm (4.65") x 11.38 cm (4.48") (L x W x H) / 2.27 kg (5 lbs)	

All specifications subject to change
* The minimum temperature attainable is dependent on the vacuum condition - temperature can be lowered w/lower vacuum

Spectral Rates

@100 kHz Full Vertical Binning (FVB)	60 fps
@ 2 MHz Full Vertical Binning (FVB)	315 fps
@ 2 MHz (0.2 mm high)	1300 fps

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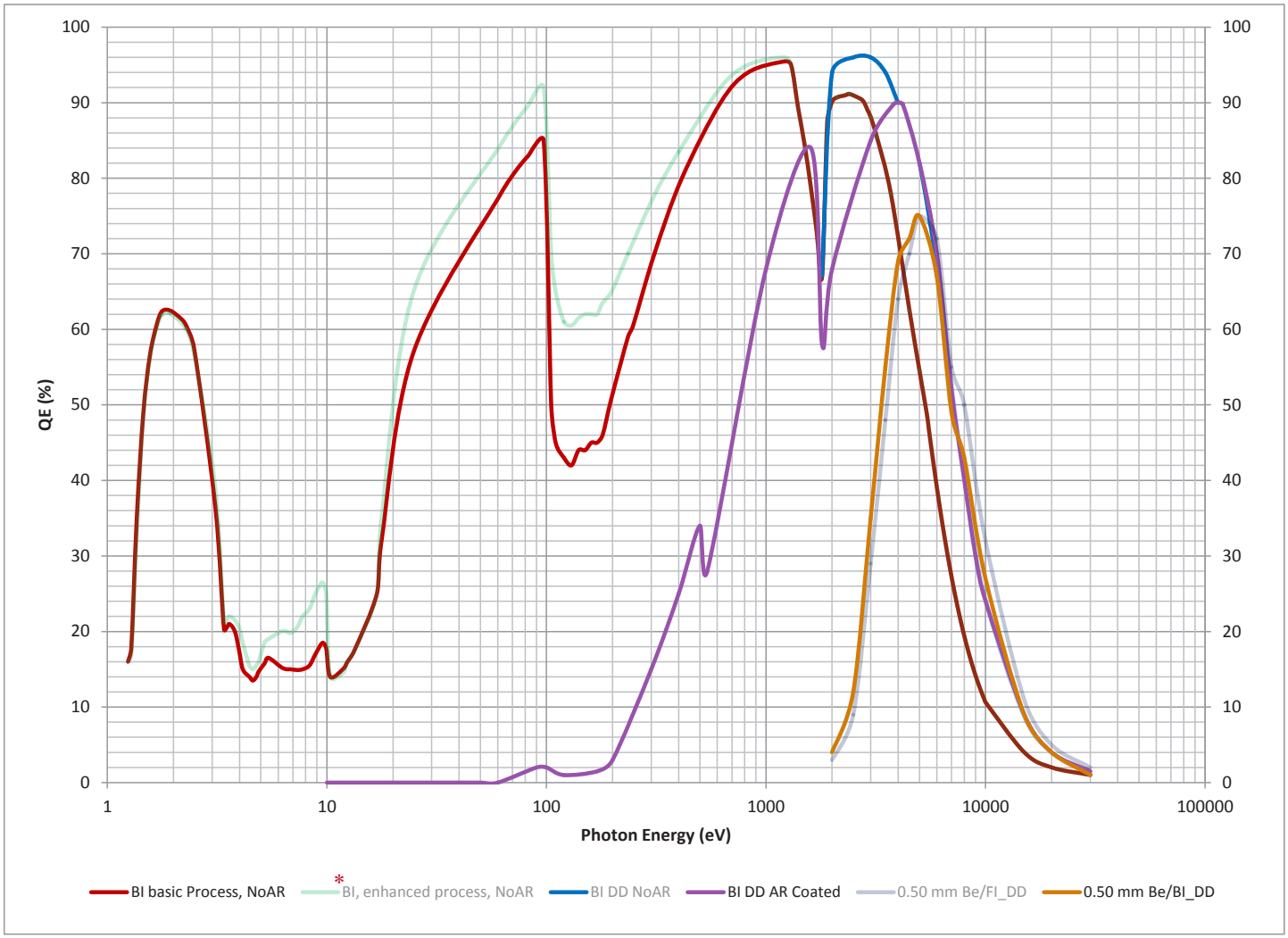
Quantum Efficiency Curve

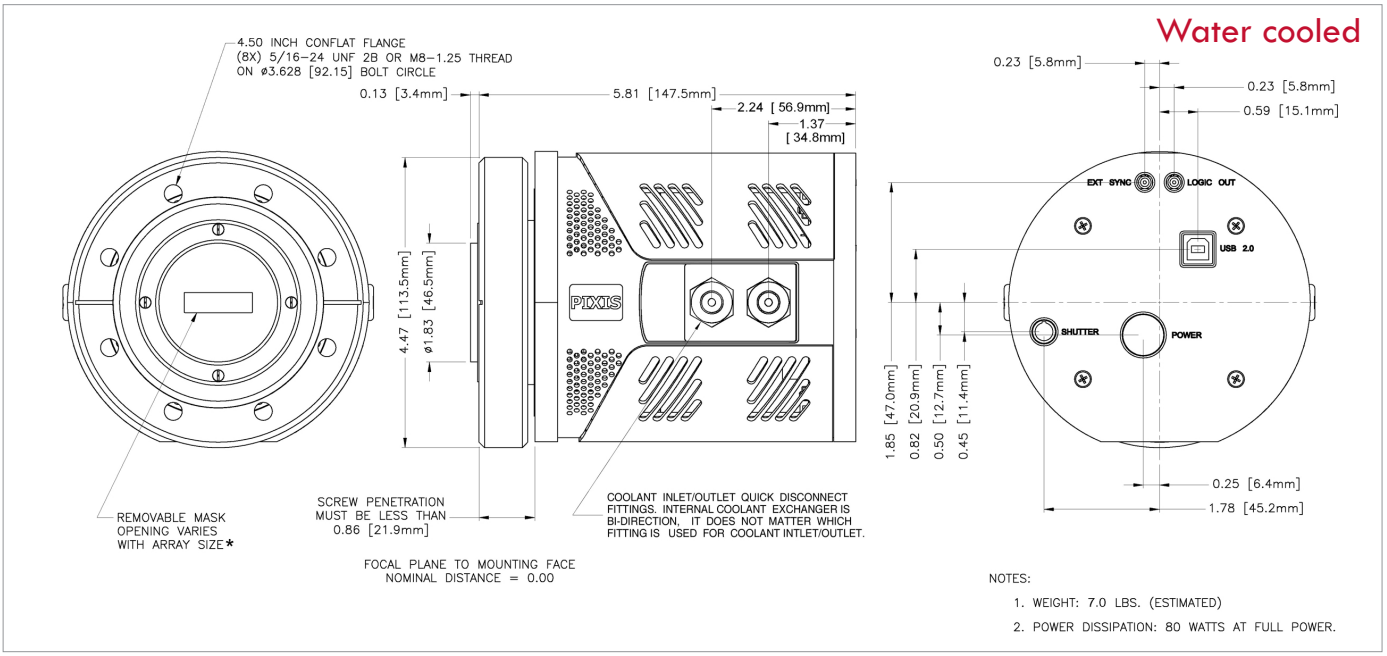


*** - For reference purpose only**

OUTLINE DRAWING

4.5” Conflat

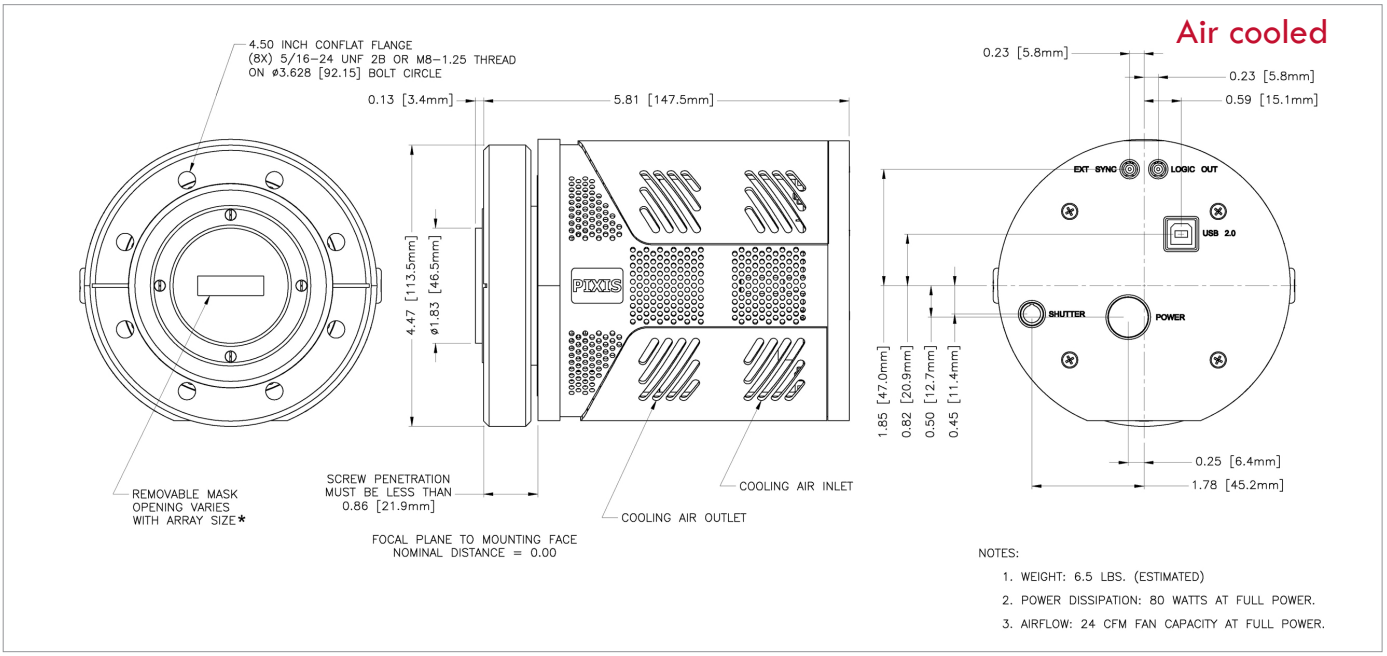
Water cooled



NOTES:

1. WEIGHT: 7.0 LBS. (ESTIMATED)
2. POWER DISSIPATION: 80 WATTS AT FULL POWER.

Air cooled



NOTES:

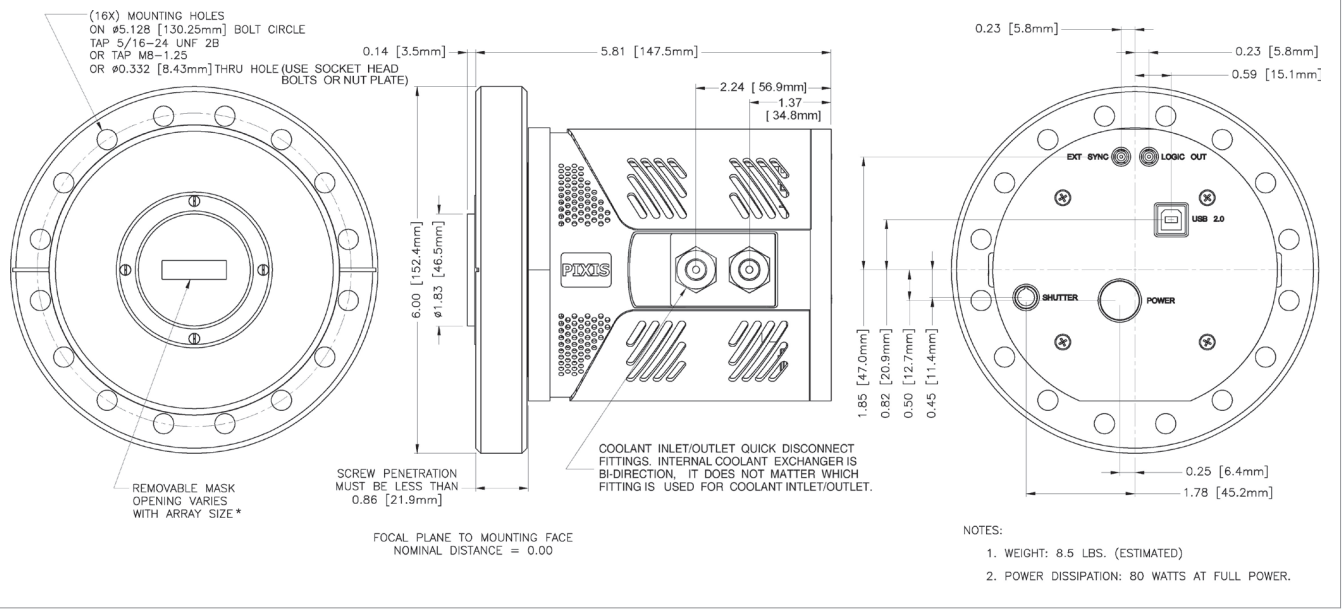
1. WEIGHT: 6.5 LBS. (ESTIMATED)
2. POWER DISSIPATION: 80 WATTS AT FULL POWER.
3. AIRFLOW: 24 CFM FAN CAPACITY AT FULL POWER.

CCD Array	CCD Image Area inches (mm)	Mask Opening ± .001 inches (± .0254 mm)
1340 x 400	1.055 x 0.315 (26.8 x 8.0)	1.052 x 0.311 (26.721 x 7.899)

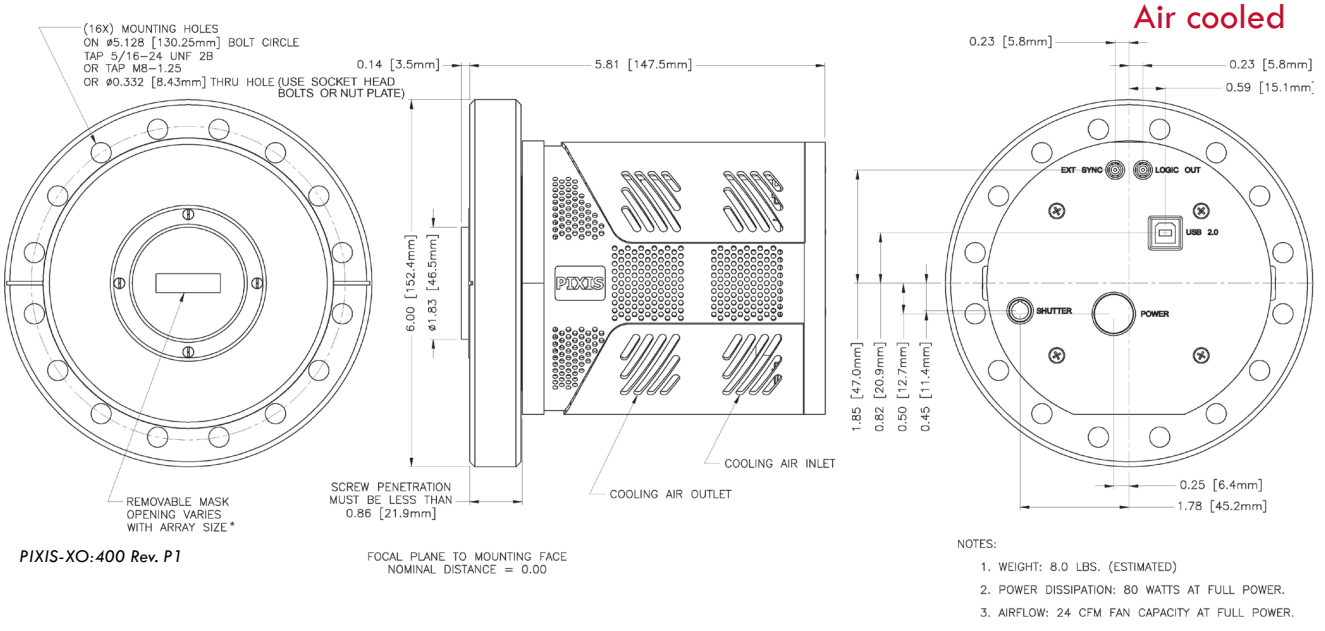
OUTLINE DRAWING

6.0” Conflat

Water cooled



Air cooled



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