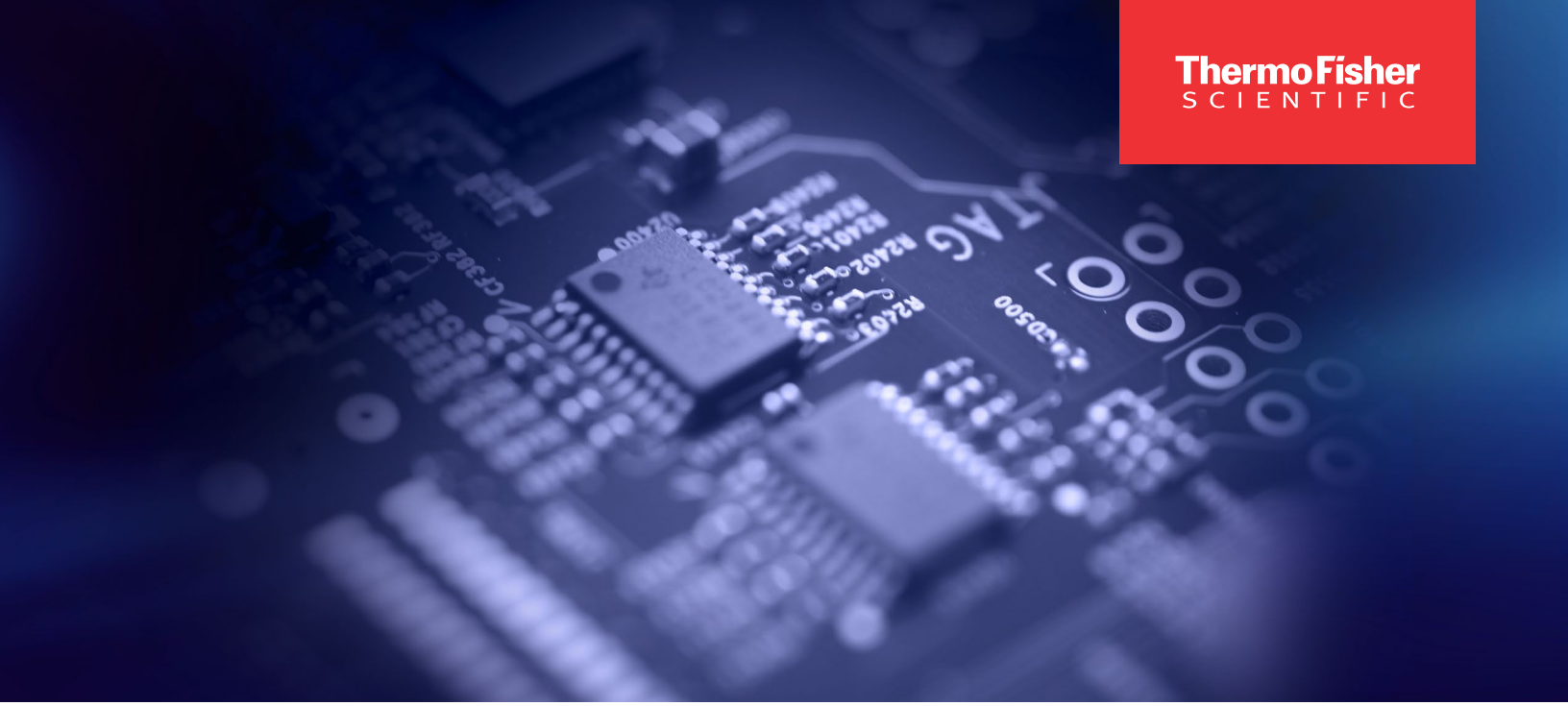

Thermo Scientific PXS5 Microfocus X-ray Sources

Thermo Scientific™ PXS5 Microfocus X-ray Sources provide a cost-efficient solution for applications in which lower voltages can deliver the performance required. Primary applications include electronic component inspection, for example for PCBs and semi-conductor devices, and dental imaging - applications where small, relatively thin structures give rise to low attenuation levels. More generally, PXS5 sources find application in other areas of AXI (automated X-ray inspection), high resolution non-destructive testing and for micro-CT (micro computed tomography). Integrated 80 and 90 kV designs include options for side window configuration and digital interfacing to provide the flexibility required for individual applications, even when space is restricted. All PXS5 sources are specified for high resolution, high magnification, and enduring stability.

Key features

- **Fully integrated design:** to reduce space requirements, with X-ray tube, high-voltage power supply, and controller in a single package powered from a 12 VDC source
- **Small spot size*, round where optimal:** to produce high-resolution, low distortion, best-in-class images
- **Short FOD (focal object distance – down to 6 mm):** to deliver very high geometric magnification and short image acquisition times
- **High flux and spot location stability:** to ensure consistent high-quality imaging with minimal temporal variation
- **Automatic source conditioning:** to minimize the risk of damage as the source comes up to operating conditions
- **Side window configuration (optional):** to enable use in smaller cabinet systems and installation flexibility
- **Digital and analog interface options:** to enable easy operation and optimal on-going performance across a range of applications

* Model dependent, 4.5 – 15 µm

Note: Each of the three options in the PXS5 source range incorporates a different combination of key features. Individual detailed specifications for the PXS5-822, PXS5-925 and PXS5-928 sources are included for reference.

PXS5-928 X-ray Source

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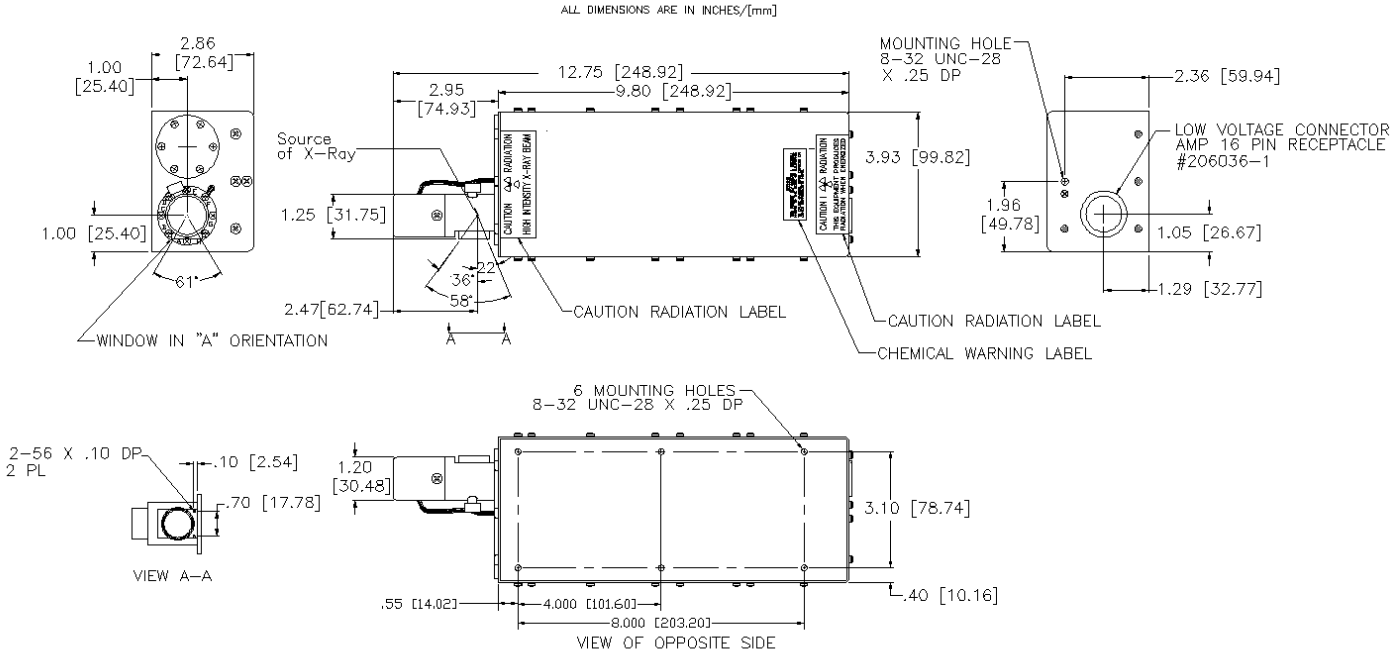
Specifications

PXS5-822 X-ray Source	
Maximum tube voltage	80 kV
Operating voltage range	20–80 kV
Tube current operational range	0–178 µA
Maximum power output	8 W
Minimum focal spot size	15 µm
X-ray beam angle	34°, round beam
Focus to object distance (FOD)	12.5 ± 0.5 mm
Target material	Tungsten
X-ray output window material	Beryllium
Weight	3.6 kg
Ambient temperature and humidity	0–32 °C, 0–95% RH, up to 1,500 m (5,000 ft) altitude
Method of cooling	Internal fan. Adequate air circulation around unit must be provided
Input power	12–14 VDC, 4A max measured at the source
Control interface	Analog control and monitoring of operating conditions and status

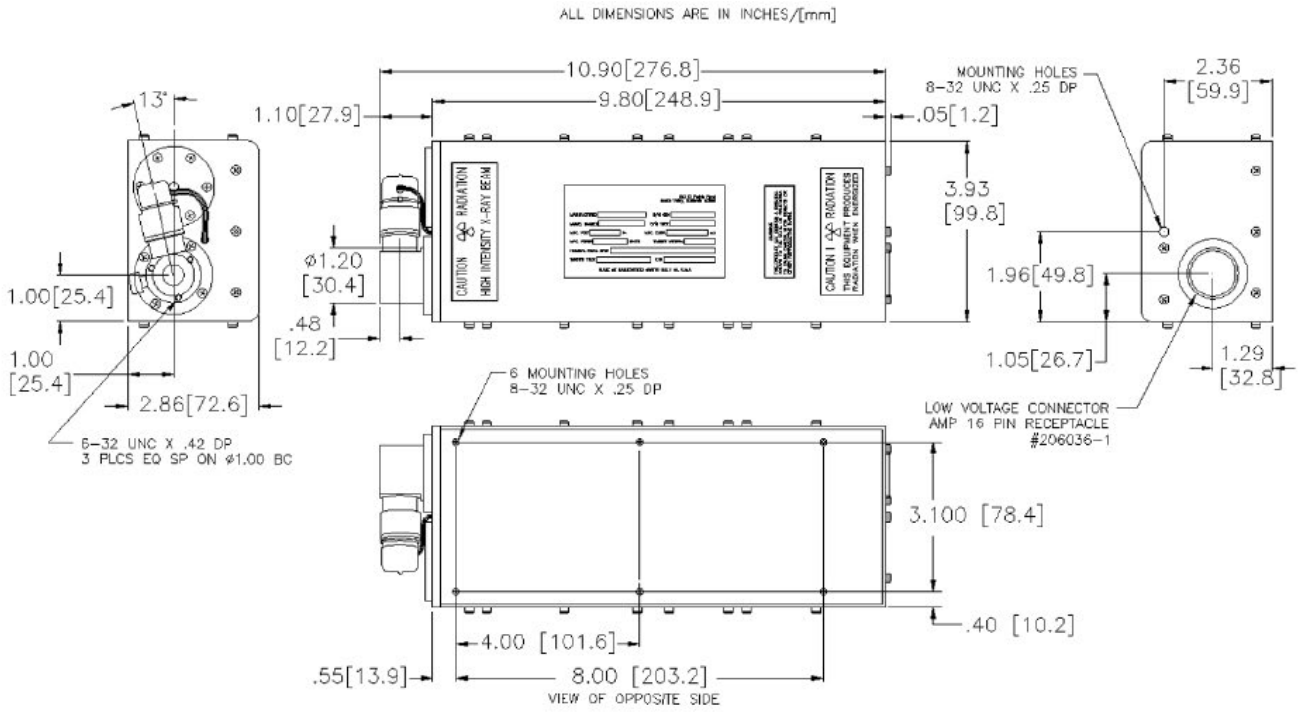
Outline drawing of PXS5-822 X-ray Source



Specifications

PXS5-925 X-ray Source	
Maximum tube voltage	90 kV
Operating voltage range	20–90 kV
Tube current operational range	0–180 µA
Maximum power output	8 W
Minimum focal spot size	5 µm
X-ray beam angle	40°, round beam
Focus to object distance (FOD)	12.0 ± 0.5 mm
Target material	Tungsten
X-ray output window material	Beryllium
Weight	3.6 kg
Ambient temperature and humidity	0–32 °C, 0–95% RH, up to 1,500 m (5,000 ft) altitude
Method of cooling	Internal fan. Adequate air circulation around unit must be provided
Input power	12–14 VDC, 4A max measured at the source
Control interface	Analog control and monitoring of operating conditions and status

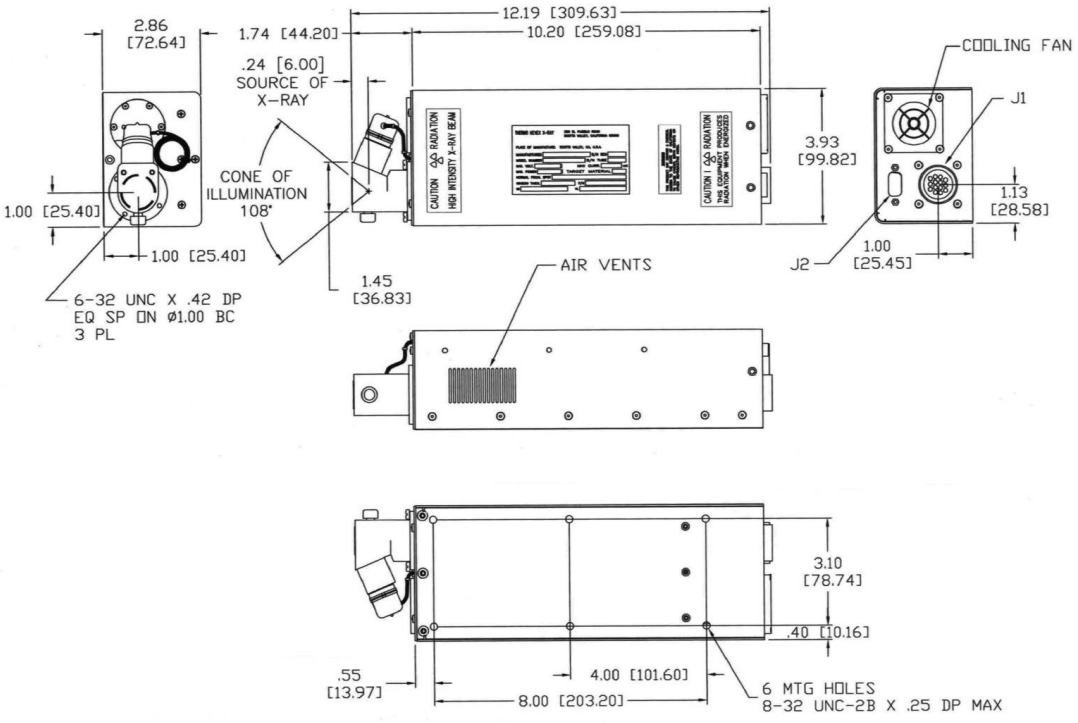
Outline drawing of PXS5-925 X-ray Source



Specifications

PXS5-928 X-ray Source	
Maximum tube voltage	90 kV
Operating voltage range	20–90 kV
Tube current operational range	0–160 µA
Maximum power output	8 W
Minimum focal spot size	4.5 µm
X-ray beam angle	108°
Focus to object distance (FOD)	6.0 mm
Target material	Tungsten
X-ray output window material	Beryllium
Weight	3.6 kg
Ambient temperature and humidity	0–32 °C, 0–95% RH, up to 1,500 m (5,000 ft) altitude
Method of cooling	Internal fan. Adequate air circulation around unit must be provided
Input power	12–14 VDC, 4A max measured at the source
Control interface	RS-232, digital, as standard. Analog version also available

Outline drawing of PXS5-928 X-ray Source



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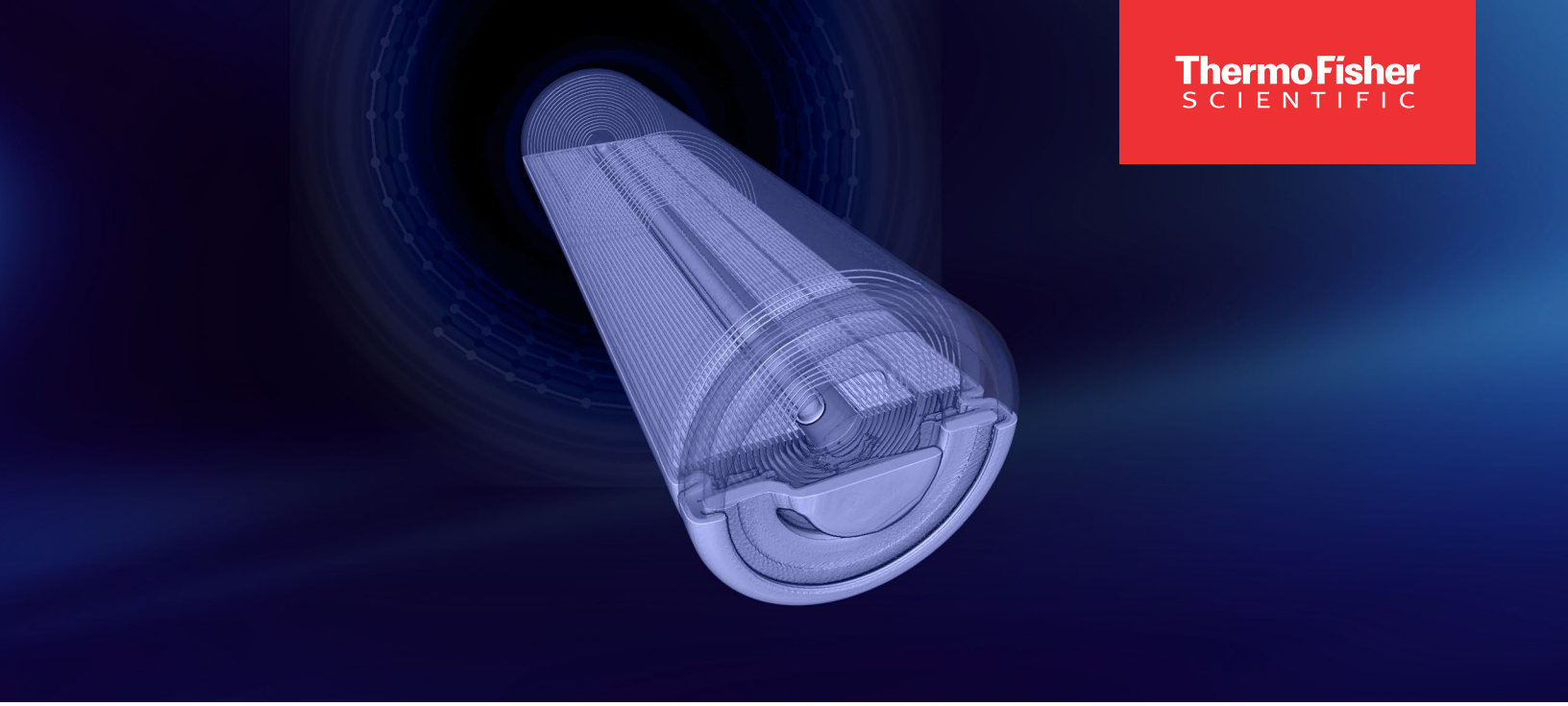


Thermo Scientific PXS10 Microfocus X-ray Sources

Thermo Scientific™ PXS10 Microfocus X-ray Sources provide a powerful, digitally controlled, 130 kV solution for the most demanding imaging, inspection, and testing tasks. Primary applications include in- and at-line battery inspection, notably for lithium batteries for EVs (electric vehicles), where complex, multilayered structures give rise to high attenuation. More generally, PXS10 sources are used in other areas of component inspection - for particularly challenging, complex electronic assemblies, for example - in high resolution non-destructive testing and micro-CT (micro computed tomography). Wide beam variants and the option to extend the window away from the cabinet deliver the flexibility to tailor magnification and field-of-view and the ability to meet individual integration requirements. All PXS10 sources are specified for highly stable, high intensity output, with a rugged design for trouble-free, long-term operation in exacting environments.

Key features

- **Small, round spot:** to produce high-resolution, low distortion, high-quality images
- **Short FOD (focal object distance):** to deliver excellent geometric magnification and short image acquisition times
- **Ultra-wide beam angle and expanded field of view (various options available):** to aid magnification and provide the flexibility to position larger objects closer to the source to reduce image acquisition times
- **High flux and spot location stability:** to ensure consistent high-quality imaging with minimal temporal variation
- **Automatic source conditioning:** to minimize the risk of damage as the source comes up to operating conditions
- **Digital interface:** to enable easy operation with access to diagnostics and operating logs to ensure optimal on-going performance
- **Fully integrated design:** to reduce space requirements, with X-ray tube, high-voltage power supply, and controller in a single package powered from a 24 VDC source

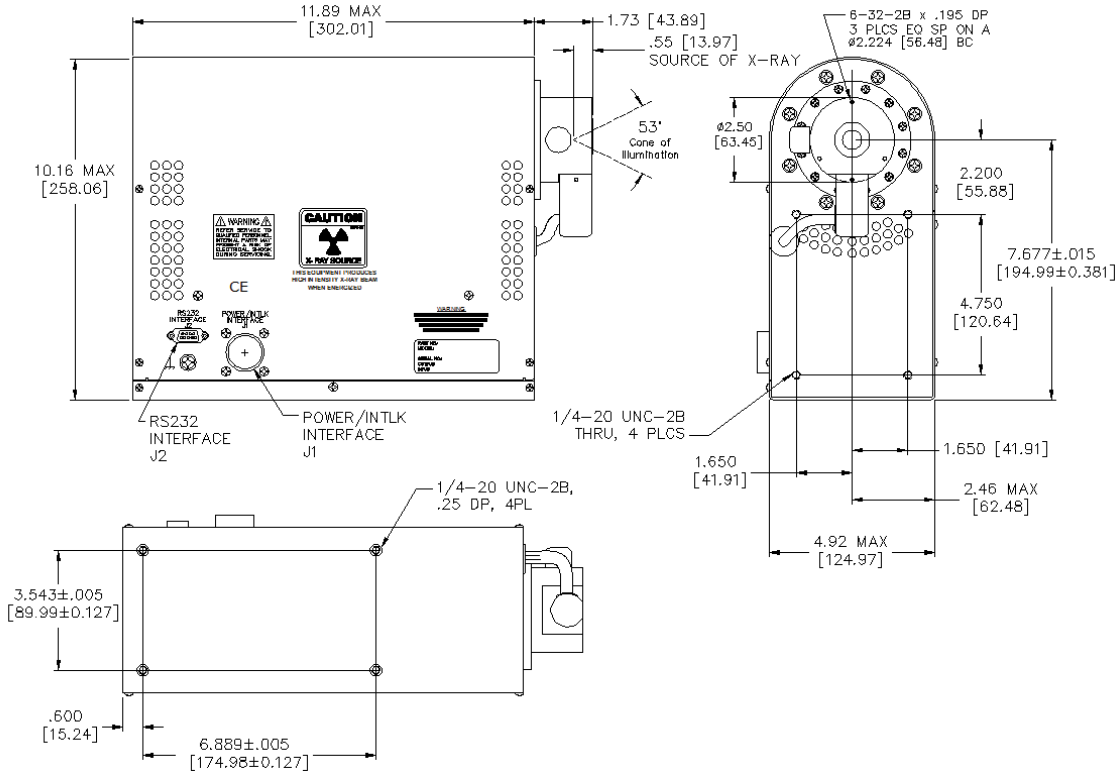
Note: The three options in the PXS10 source range vary with respect to beam angle and field of view. Individual detailed specifications for the PXS10-NB, PSX10-WB and PSX10-WBE sources are included for reference.

PXS10 X-ray Source

Specifications

PXS10 X-ray Source	
Maximum tube voltage	130 kV
Operating voltage range	45 – 130 kV
Tube current operational range	0 – 500 µA
Maximum power output	65 W
Minimum focal spot size	6 µm
X-ray beam angle	53°, round beam
Focus to object distance (FOD)	14.0 ± 0.5 mm
Target material	Tungsten
X-ray output window material	Beryllium
Weight	13.6 kg. Lightweight model (LW) 9.5 kg
Ambient temperature and humidity	0 – 32 °C, 0 – 95% RH, up to 1,500 m (5,000 ft) altitude
Method of cooling	Internal fan. Adequate air circulation around unit must be provided
Input power	24 – 26 VDC, 6A max
Control interface	RS-232, digital

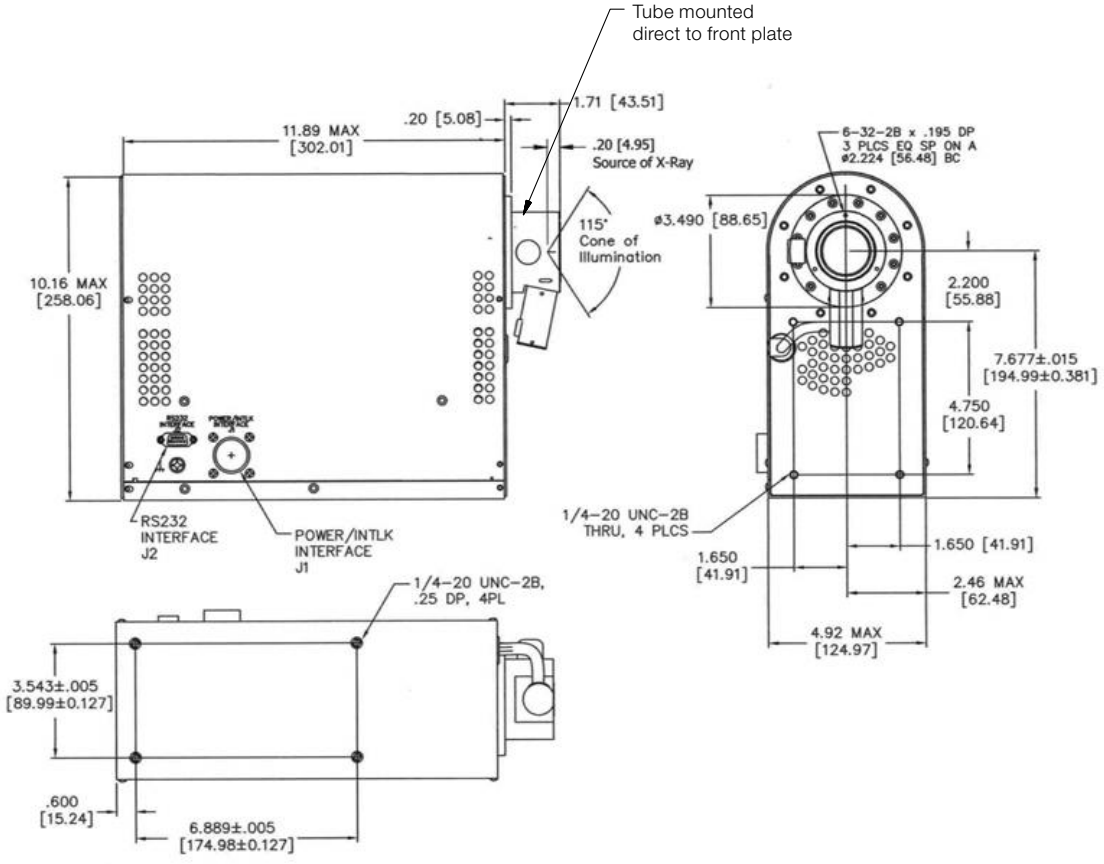
Outline drawing of PXS10 X-ray Source



Specifications

PXS10-WB X-ray Source	
Maximum tube voltage	130 kV
Operating voltage range	45 – 130 kV
Tube current operational range	0 – 500 µA
Maximum power output	65 W
Minimum focal spot size	7 µm
X-ray beam angle	115°, round beam
Focus to object distance (FOD)	10.0 ± 0.5 mm
Target material	Tungsten
X-ray output window material	Beryllium
Weight	13.6 kg. Lightweight model (LW) 9.5 kg
Ambient temperature and humidity	0 – 32 °C, 0 – 95% RH, up to 1,500 m (5,000 ft) altitude
Method of cooling	Internal fan. Adequate air circulation around unit must be provided
Input power	24 – 26 VDC, 6A max
Control interface	RS-232, digital

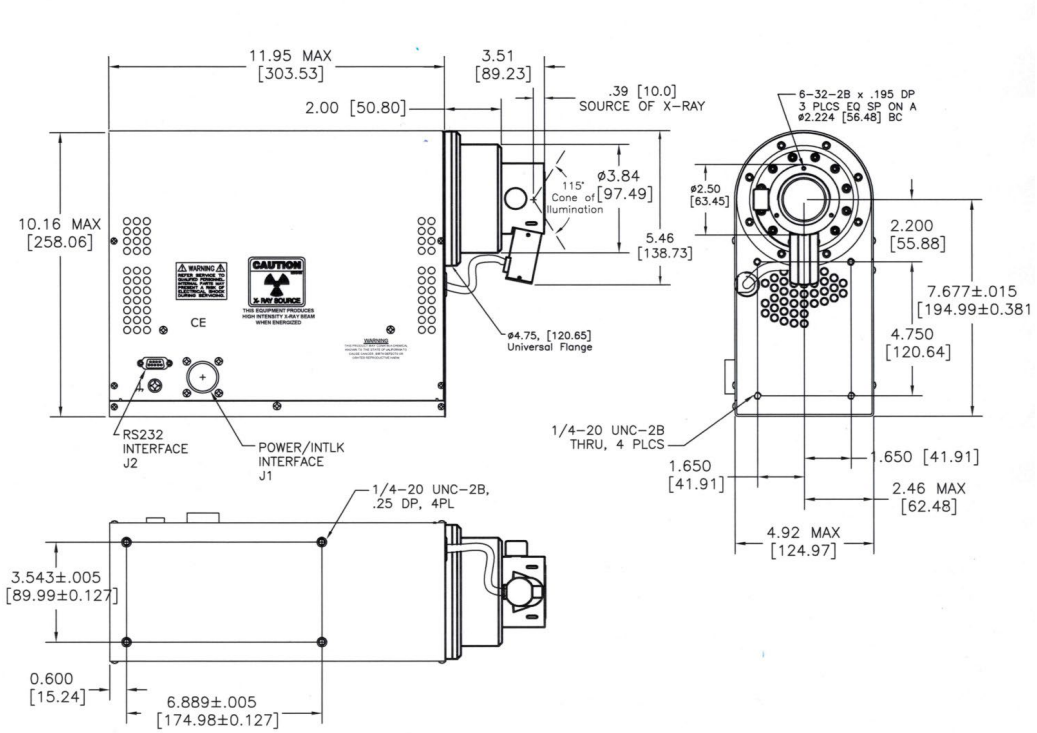
Outline drawing of PXS10-WB X-ray Source



Specifications

PXS10-WBE X-ray Source	
Maximum tube voltage	130 kV
Operating voltage range	45–130 kV
Tube current operational range	0–500 µA
Maximum power output	65 W
Minimum focal spot size	7 µm
X-ray beam angle	115 °, round beam
Focus to object distance (FOD)	10.0 ± 0.5 mm
Target material	Tungsten
X-ray output window material	Beryllium
Weight	13.6 kg. Lightweight model (LW) 9.5 kg
Ambient temperature and humidity	0–32 °C, 0–95% RH, up to 1,500 m (5,000 ft) altitude
Method of cooling	Internal fan. Adequate air circulation around unit must be provided
Input power	24–26 VDC, 6A max
Control interface	RS-232, digital

Outline drawing of PXS10-WBE X-ray Source



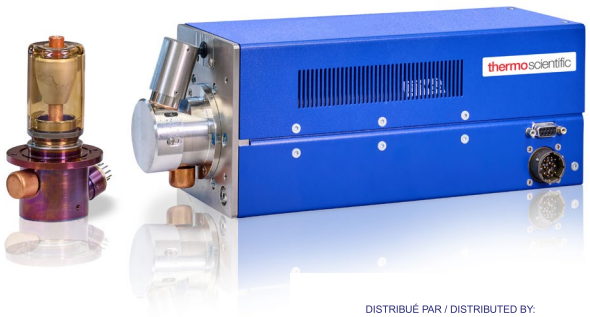
Thermo Scientific PXS15 Microfocus X-ray Sources

Thermo Scientific™ PXS15 Microfocus X-ray Sources provide an effective solution for demanding imaging and inspection tasks within the production environment. Primary applications include battery inspection, for both EV (electric vehicle) cells and relatively small and simple batteries such as the lithium cells used to power smart devices. More generally, PXS15 sources are used in other areas of component inspection, in non-destructive testing and for micro-CT (micro computed tomography). A wide beam variant of the core model provides the flexibility to tailor magnification and field of view for individual requirements. Both PXS15 options have a digital interface and are specified for high power and high magnification, with a rugged design that delivers the reliability required for routine industrial measurement.

Key features

- **Small, round spot**: to produce high-resolution, low distortion, high-quality images
- **Short FOD (focal object distance):** to deliver excellent geometric magnification and short image acquisition times
- **Large field of view:** to aid magnification and reduce image acquisition times
- **High flux and spot location stability:** to ensure consistent high-quality imaging with minimal temporal variation
- **Automatic source conditioning:** to minimize the risk of damage as the source comes up to operating conditions
- **Digital interface:** to enable easy operation with access to diagnostics and operating logs to ensure optimal on-going performance

Note: The two options in the PXS15 source range vary with respect to beam angle and field of view. Individual detailed specifications for the PXS15-NB and the PXS15-WB sources are included for reference.



PXS15-WB X-ray Source

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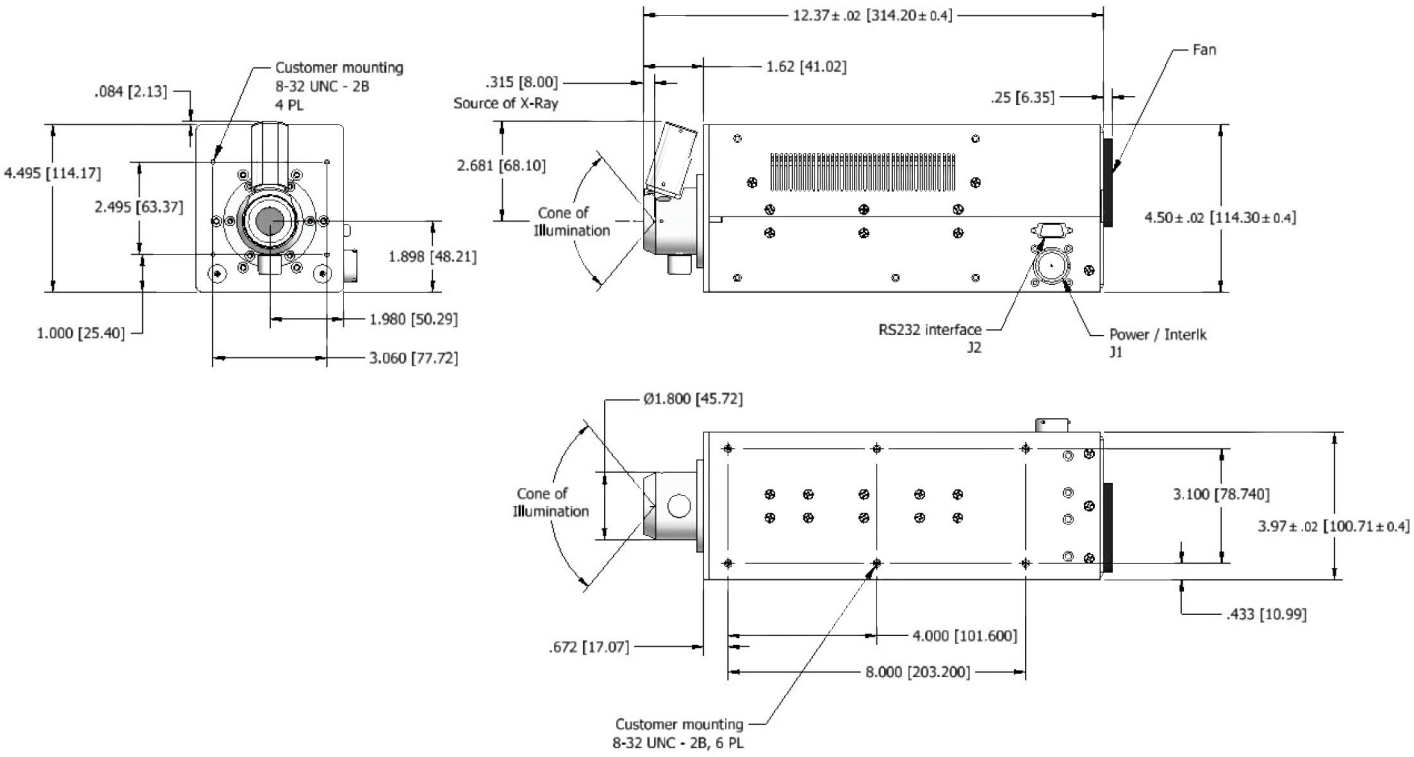
Specifications

PXS15-NB X-ray Source	
Maximum tube voltage	110 kV
Operating voltage range	40–110 kV
Tube current operational range	0–250 µA
Maximum power output	25 W
Minimum focal spot size	5 µm
X-ray beam angle	90°
Focus to object distance (FOD)	7.5 ± 1.0 mm
Target material	Tungsten
X-ray output window material	Beryllium
Weight	5.7 kg
Ambient temperature and humidity	0–32 °C, 0–95% RH, up to 1,500 m (5,000 ft) altitude
Method of cooling	Internal fan is sufficient for ambient temperature up to 32 °C. Adequate air circulation around unit must be provided
Input power	24 VDC ± 3VDC, 4A max
Control interface	RS-232, digital

Outline drawing of PXS15-NB X-ray Source



Specifications

PXS15-WB X-ray Source	
Maximum tube voltage	110 kV
Operating voltage range	40 – 110 kV
Tube current operational range	0 – 250 µA
Maximum power output	25 W
Minimum focal spot size	7 µm
X-ray beam angle	125 °
Focus to object distance (FOD)	7.5 ±1.0 mm
Target material	Tungsten
X-ray output window material	Beryllium
Weight	5.7 kg
Ambient temperature and humidity	0 – 32 °C, 0 – 95% RH, up to 1,500 m (5,000 ft) altitude
Method of cooling	Internal fan is sufficient for ambient temperature up to 32 °C. Adequate air circulation around unit must be provided
Input power	24VDC ± 3VDC, 4A max
Control interface	RS-232, digital

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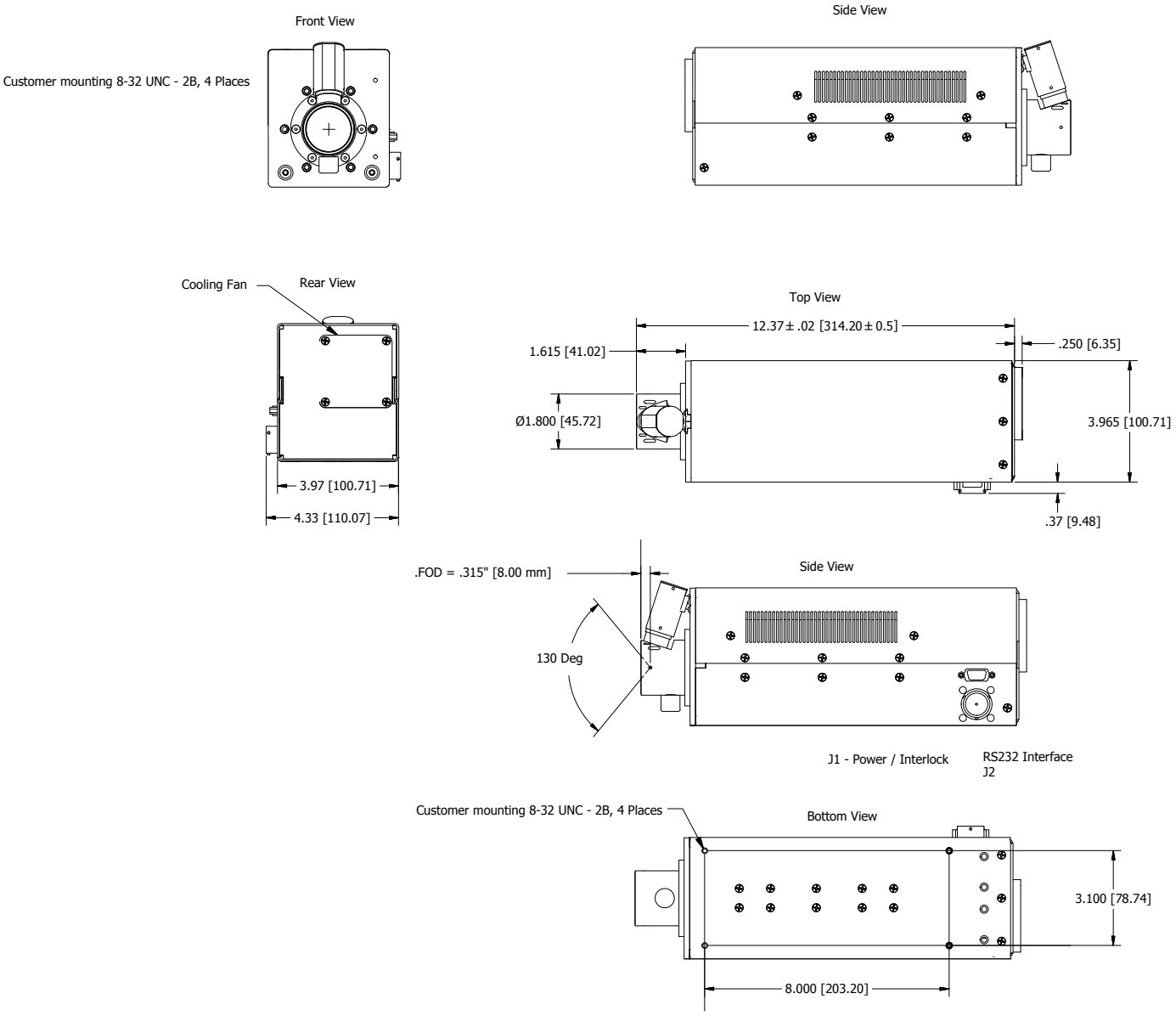
Outline drawing of PXS15-WB X-ray Source



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