

# X-RAY SOURCE

# 150 kV MICROFOCUS X-RAY SOURCE

## L12161-07



## FEATURES

- **Focal spot size: 5  $\mu\text{m}$  (at 4 W)**  
The focal spot of 5  $\mu\text{m}$  of the sealed type X-ray tube offers sharp and clear X-ray images even at a high magnification.
- **High power: Maximum output 75 W**
- **External control via RS-232C interface**
- **High speed ramping-up**  
Ramping-up speeded up to 3 times faster than conventional 150 kV microfocus X-ray source.
- **No high voltage cable connection required**  
High voltage power supply is integrated.

## APPLICATIONS

- **Non-destructive inspection**
- **X-ray CT**

### [Applicable objects]

- Semiconductor device
- Electronic component
- Printed circuit board
- Ceramic
- Plastic component
- Die casting
- Metal component

# SPECIFICATIONS

## GENERAL

Parameter	Description / Value	Unit
X-ray tube voltage setting range	0 to 150	kV
X-ray tube current setting range	0 to 500	μA
X-ray tube voltage operational range <sup>①</sup>	40 to 150	kV
X-ray tube current operational range <sup>①</sup>	10 to 500	μA
Maximum output	Small Focus Mode	10
	Middle Focus Mode	30
	Large Focus Mode	75
X-ray focal spot size (Nominal value)	Small Focus Mode	7 (5 μm at 4 W)
	Middle Focus Mode	20
	Large Focus Mode	50
X-ray beam angle <sup>②</sup>	Approx. 43	degree
Focus to object distance (FOD)	Approx. 17	mm
Rated output	Continuous rating	—
Communication method	Interface: RS-232C (9-pin D-sub connector)	—

## X-RAY TUBE UNIT

Parameter	Description / Value	Unit
X-ray output window material / Thickness	Beryllium / 0.2	μm
Target material	Tungsten	—
Operating ambient temperature	+10 to +40	°C
Storage ambient temperature	0 to +50	°C
Operating and storage humidity	20 to 85 (No condensation)	%
Weight	Approx. 13.5	kg

## X-RAY CONTROL UNIT

Parameter	Description / Value	Unit
Input voltage (AC)	Single phase 100 to 240 (50 Hz / 60 Hz)	V
Power consumption	Less than 220	W
Operating ambient temperature	+10 to +40	°C
Storage ambient temperature	0 to +50	°C
Operating and storage humidity	20 to 85 (No condensation)	%
Weight <sup>③</sup>	Approx. 6	kg

## REGULATION AND STANDARDS

Parameter	Description	Unit
RoHS directive	EN 50581 Category 9	—
EMC	IEC/EN 61326-1 Emission limits: CISPR 11 Group 1 Class A Immunity requirements: Table 2	—
Safety	IEC/EN 61010-1	—

## CONTROL SOFTWARE <sup>④</sup>

Parameter	Description	Unit
Applicable PC	PC / AT compatible	—
Applicable OS	Windows® XP, 7	—
Interface	RS-232C interface	—

- NOTE:**
- ① See the graph of the X-ray tube voltage / current operation range.
  - ② Reference value: With 50 % of maximum X-ray emission.
  - ③ This weight includes the accessories of approx. 1.5 kg.
  - ④ The control software is provided as a sample software for the purpose of MFX operation.  
The performance of the software is not guaranteed.



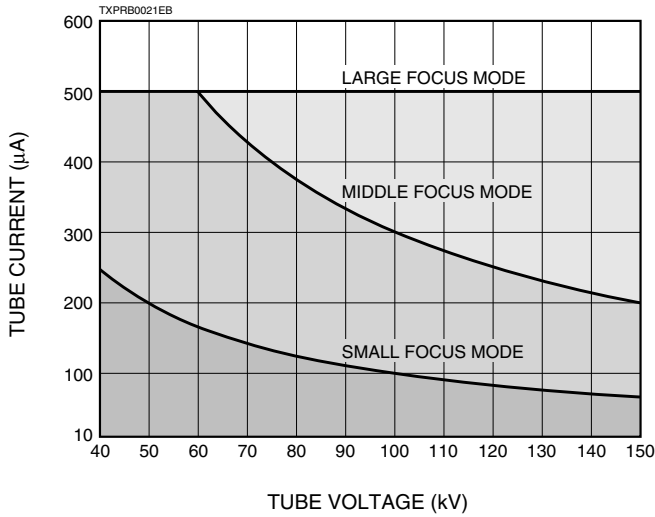
### PRECAUTIONS TO USE

- This microfocus X-ray source generates X-rays harmful to the human body. Use sufficient caution when handling the equipment to avoid direct or inadvertent exposure to X-rays.  
Install the X-ray source or the X-ray tube unit in an X-ray shielded cabinet or room equipped with safety interlock functions to prevent accidental exposure to X-rays.

### OPERATIONAL CAUTION

- This microfocus X-ray source generates X-rays and must therefore be used only under the supervision of qualified personnel.
- This microfocus X-ray source shall be used in compliance with health and safety regulations enforced in order to prevent health hazards problems due to ionizing radiation.

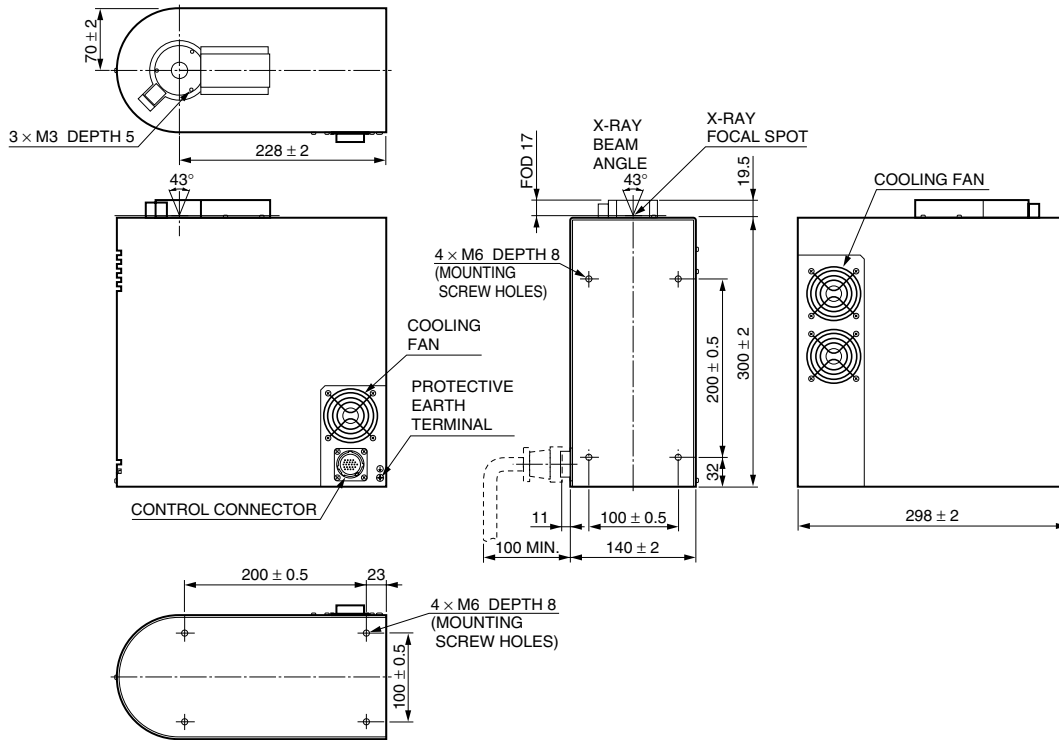
# X-RAY TUBE VOLTAGE / CURRENT OPERATION RANGE



\* The X-ray tube voltage guaranteed range is 40 kV to 150 kV.  
 \* Operation is not guaranteed when the tube current is below 10  $\mu\text{A}$ .

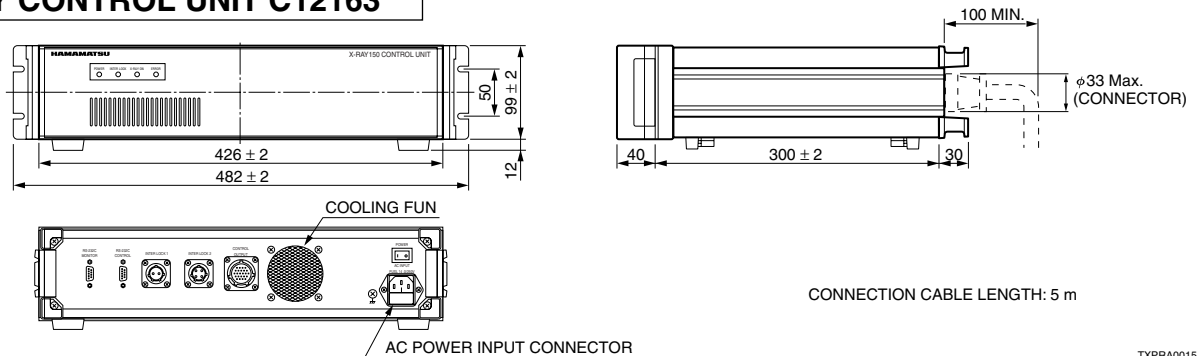
## DIMENSIONAL OUTLINES (Unit: mm)

### X-RAY TUBE UNIT L8122-01



TXPRA0014EB

### X-RAY CONTROL UNIT C12163



TXPRA0015EA

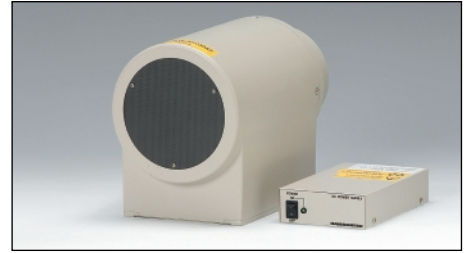
# RELATED PRODUCTS

## X-RAY IMAGE INTENSIFIER DIGITAL CAMERA UNIT C7336-05/-52

The C7336 series consist of a high resolution, high contrast 4-inch X-ray image intensifier (X-ray I.I.) and a 2.8 megapixel CMOS image sensor.

The X-ray I.I. used has a fixed field-of-view of 100 mm diameter or a 4 inches/2 inches adjustable field-of-view and an input window made of thin aluminum which is excellent in X-ray transmission and causes less scattering of X-rays. These features allow real-time detection at X-ray energy levels from about 20 keV.

The captured images can be transferred to PC directly by interface of IEEE1394b.



## X-CUBE™ (COMPACT X-RAY CCD CAMERA) H8480, H8481, H8953

X-CUBEs are compact X-ray CCD camera designed for non-destructive inspection, which make X-ray imaging as easy as an ordinary CCD camera in handling. The H8480 and H8953 use a 2/3 type CCD coupled to large-diameter tapered FOPs which are coated with CsI. The H8481 uses a straight type FOP instead of the large FOP, achieving a high resolution of 20 Lp/mm.



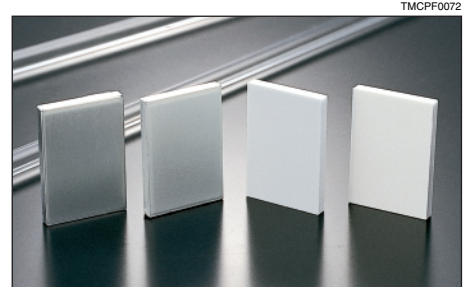
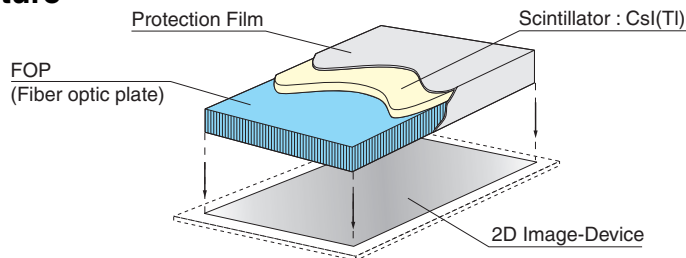
Left: H8480 Center: H8953 Right: H8481

## FOS (Fiber optic plate coated with X-ray scintillator)

The FOS is an optical device for X-ray imaging, fabricated by coating an X-ray scintillator material over a fiber optic plate consisting of more than tens of million glass fibers each a few micrometers in diameter. The FOS provides higher sensitivity and resolution than currently used sensitized paper films and also allows real-time digital radiography when directly coupled to a commercially available CCD. The fiber optic plate used in the FOS has excellent X-ray absorption characteristics, so that X-rays penetrating the X-ray scintillator and directly entering the CCD are minimized to less than 1%. This protects the CCD from the deterioration and increased noise caused by X-ray irradiation, assuring a long service life and maintaining high image quality.

Various sizes and shapes of FOS are available to meet your particular needs, including tapered FOP types.

### Structure



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