

X-RAY SOURCE

150 kV MICROFOCUS X-RAY SOURCE

L12161-07



FEATURES

- **Focal spot size: 5 μm (at 4 W)**
The focal spot of 5 μm 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 ^①	40 to 150	kV
X-ray tube current operational range ^①	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 ^②	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	mm
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 ^③	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^④

Parameter	Description	Unit
Applicable PC	PC / AT compatible	—
Applicable OS	Windows® 8.1, 10	—
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.

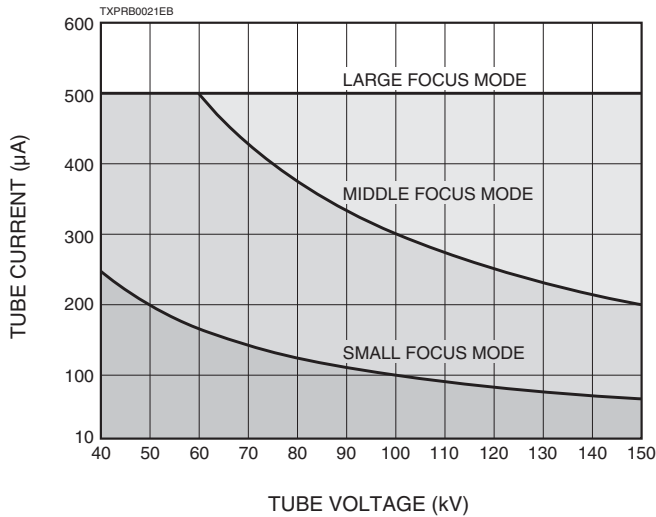
PRECAUTIONS TO USE

- 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.

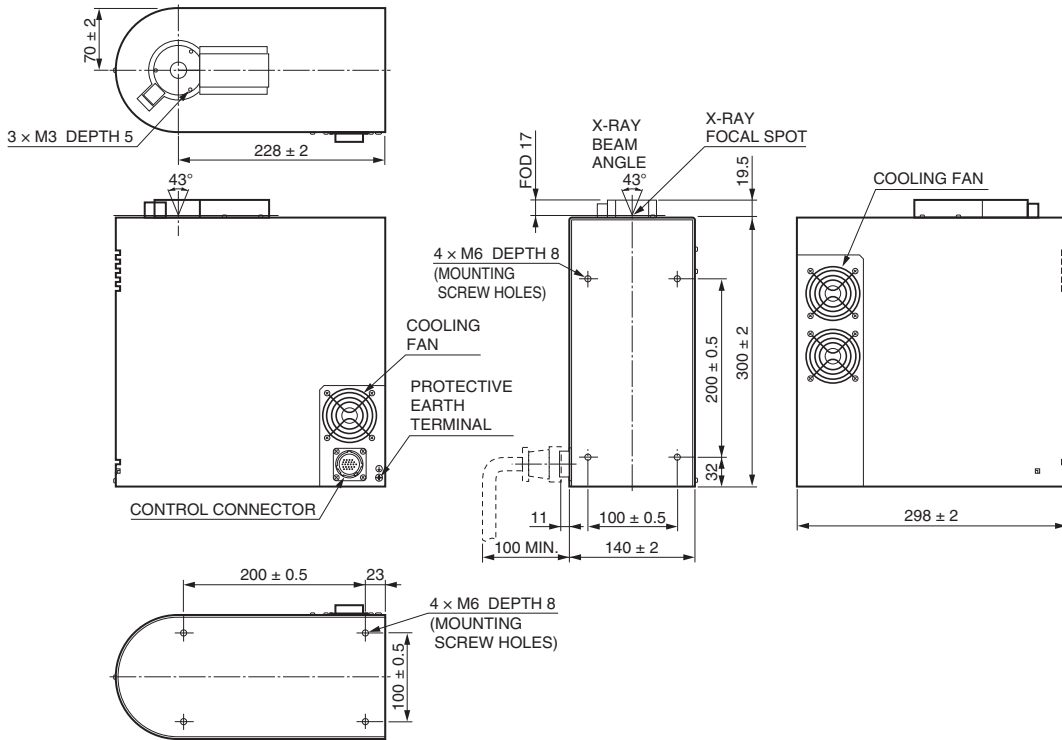
X-RAY TUBE VOLTAGE / CURRENT OPERATION RANGE



* The X-ray tube voltage guaranteed range is 40 kV to 150 kV.
 * Operation is not guaranteed when the tube current is below 10 µA.

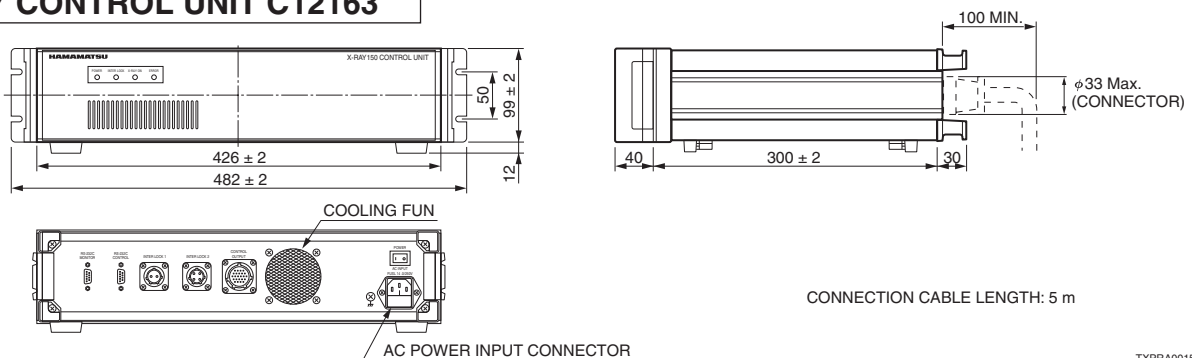
DIMENSIONAL OUTLINES (Unit: mm)

X-RAY TUBE UNIT L8122-01



TXPRA0014EB

X-RAY CONTROL UNIT C12163



CONNECTION CABLE LENGTH: 5 m

TXPRA0015EA

RELATED PRODUCTS

X-RAY IMAGE INTENSIFIER DIGITAL CAMERA UNIT C7336-06/07

Camera units C7336-06/07 consist of a high resolution, high contrast 4-inch X-ray image intensifier (X-ray I.I.) and a 2.35 mega-pixel or 3 mega-pixel CMOS image sensor respectively.

The X-ray I.I. has 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 Mini Camera-Link or USB3.0.

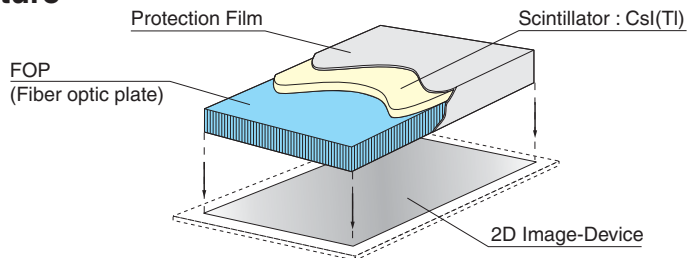


FOS (Fiber optic plate coated with X-ray scintillator)

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



Windows® is a registered trademark of Microsoft Corporation in the United States and/or other countries.

Other product and software names mentioned herein may be either registered trademarks or trademarks of their respective owners.

Subject to local technical requirements and regulations, availability of products included in this promotional material may vary. Please consult with our sales office.

Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein. ©2020 Hamamatsu Photonics K.K.

HAMAMATSU PHOTONICS K.K. www.hamamatsu.com

Electron Tube Division

314-5, Shimokanzo, Iwata City, Shizuoka Pref., 438-0193, Japan, Telephone: (81)539/62-5248, Fax: (81)539/62-2205

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com

Germany: Hamamatsu Photonics Deutschland GmbH.: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01 E-mail: info@hamamatsu.se

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R.China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081 E-mail: info@hamamatsu.com.tw

TXPR1023E03

FEB. 2020 IP