

ROTANODE™

E7886X  0197
E7886FX

Rotating Anode X-ray Tube Assembly

- ◆ Rotating anode X-ray tube assembly for the purpose of general diagnostic procedures.
- ◆ Specially processed rhenium-tungsten faced molybdenum target of 74 mm diameter.
- ◆ These tubes have foci 1.3 and 0.7, and are available for a maximum tube voltage 150 kV.
- ◆ Accommodated with IEC60526 type high-voltage cable receptacles.



General Data

IEC Classification (IEC60601-1:2005+A1:2012) Class I ME EQUIPMENT

Electrical:

Circuit:

High Voltage Generator Constant Potential High-Voltage Generator
Grounding Center-grounded

Nominal X-ray Tube Voltage:

Radiographic 150 kV

Nominal Focal Spot Value:

Large Focus 1.3

Small Focus 0.7

Nominal Anode Input Power (at 0.1s):

	60 Hz	50 Hz
Large Focus	40 kW	36 kW
Small Focus	17 kW	15 kW

Nominal Radiographic Anode Input Power:

	60 Hz	50 Hz
Large Focus	38 kW	35 kW
Small Focus	17 kW	15 kW

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Motor Ratings:

Stator: XS-AL

		Starting	Running
Driven Frequency	[Hz]	50/60	50/60
Input Power	[W]	910	83
Voltage ^{1) 3)}	[V]	130	40
Current ²⁾	[A]	7.8	2.3
Min. Speed Up ⁴⁾	[s]	0.8	-
Capacitor	[µF]	44	44

Note 1) Applied voltage between common and main terminal.

2) Common Current.

3) The every applied voltage must be never exceeded 110% of the above specification.

4) The speed-up time is allowed up to 110% of the above specification.

Anode Speed:

60 Hz Minimum 3200 min⁻¹
 50 Hz Minimum 2700 min⁻¹

Stator Resistance:

Common-Main Winding 9.4 Ω
 Common-Auxiliary Winding 28.3 Ω

Resistance between Housing and Low Voltage Terminals Minimum 2 MΩ

Normal Operating Range of the Housing Temperature 16 ~75 °C

Mode of Operation Intermittent

Mechanical:

Dimensions See dimensional outline

Overall Length 479 mm

Maximum Diameter 152.4 mm

Target:

Anode Angle 16 degrees

Diameter 74 mm

Construction Rhenium-Tungsten faced Molybdenum

Filtration:

Permanent Filtration 0.9 mm Al / 75 kV IEC60522:1999

Available Additional Filter combination (0.4 - 1.5 mm) Maximum 2.4 mm Al / 75 kV

Radiation Protection (In accordance with IEC60601-1-3:2008):

Leakage Technique Factor 150 kV, 3.4 mA

X-ray Coverage 354 × 354 mm at SID 750 mm

Weight (Approx.) 16 kg

High Voltage Receptacle To meet the requirements of IEC60526 Corrigendum1:2010

Cooling Method Natural or forced air

Tube Housing Model Number:

E7886X XH-121

E7886FX XH-126

Absolute Maximum and Minimum Ratings

(At any time, these values must not be exceeded.)

Maximum X-ray Tube Voltage:

Radiographic	150 kV
Between Anode (or Cathode) and Ground	75 kV
Minimum X-ray Tube Voltage	40 kV
Maximum X-ray Tube Current	See rating charts
Large Focus	550 mA
Small Focus	280 mA

Maximum Filament Current:

Large Focus	5.3 A
Small Focus	5.5 A

Filament Voltage:

Large Focus (At maximum filament current 5.3 A)	10.9 ~ 14.7 V
Small Focus (At maximum filament current 5.5 A)	6.7 ~ 9.0 V

Filament Frequency Limits 0 ~ 25 kHz

Continuous Anode Input Power 60 W (85HU/s)

Thermal Characteristics:

Anode Heat Content	210 kJ (300 kHU)
Maximum Anode Heat Dissipation	870 W (1226 HU/s)
X-ray Tube Assembly Heat Content	900 kJ (1250 kHU)

Nominal Continuous Input Power:

Without Air-circulator	180 W (15 kHU/min)
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Environmental Limits

Operating Limits:

Temperature	10 ~ 40 °C
Humidity	30 ~ 85 %
	(No condensation)
Atmospheric Pressure	70 ~ 106 kPa

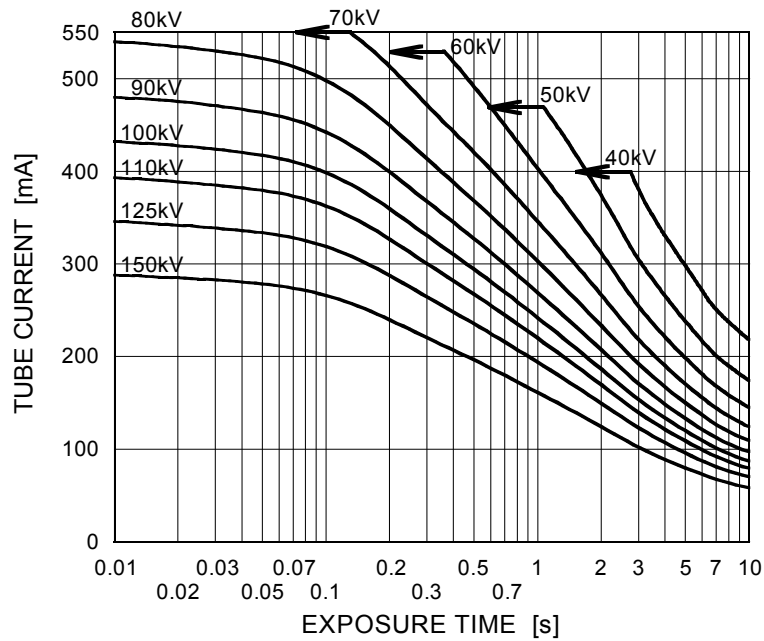
Shipping and Storage Limits:

Temperature	-20 ~ 70 °C
Humidity	20 ~ 90 %
	(No condensation)
Atmospheric Pressure	50 ~ 106 kPa

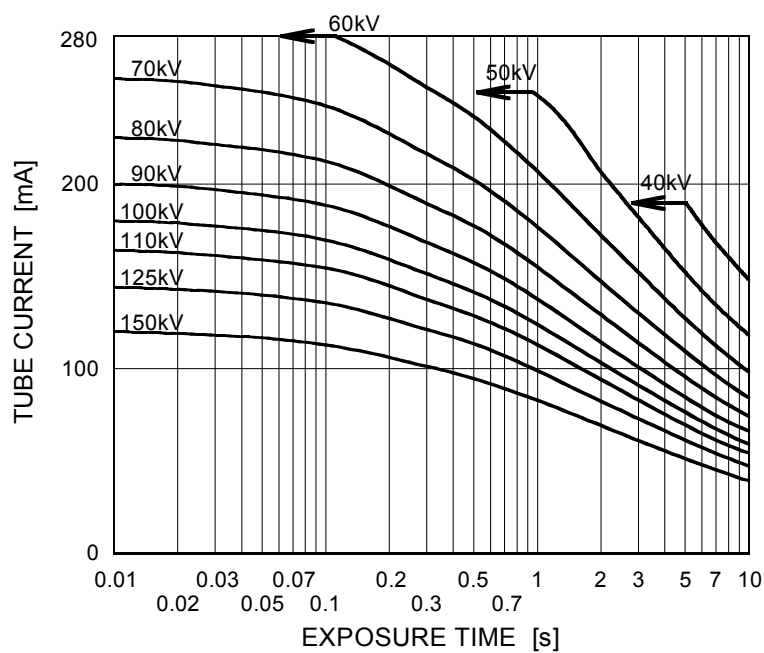
Maximum Rating Charts (Absolute Maximum Rating Charts)

Conditions: Constant Potential High-Voltage Generator
Stator Power Frequency 60Hz

Nominal Focal Spot Value: 1.3 ■



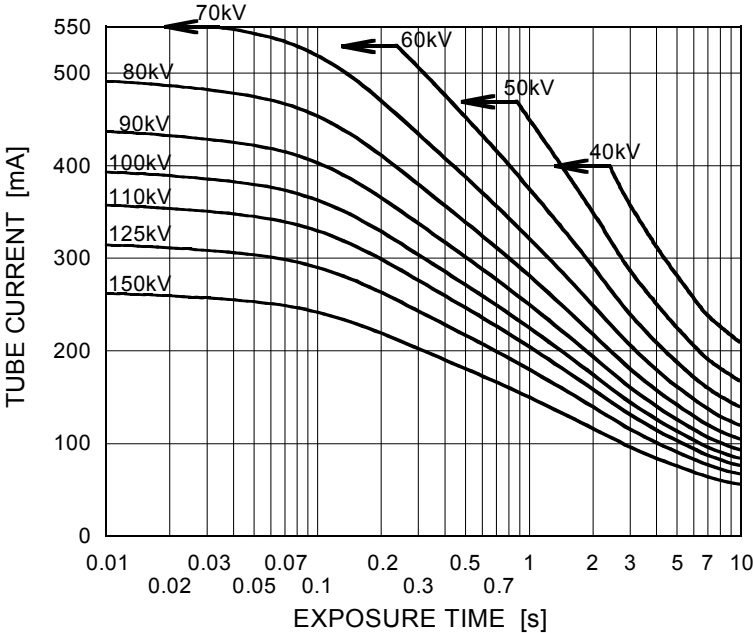
Nominal Focal Spot Value: 0.7 □



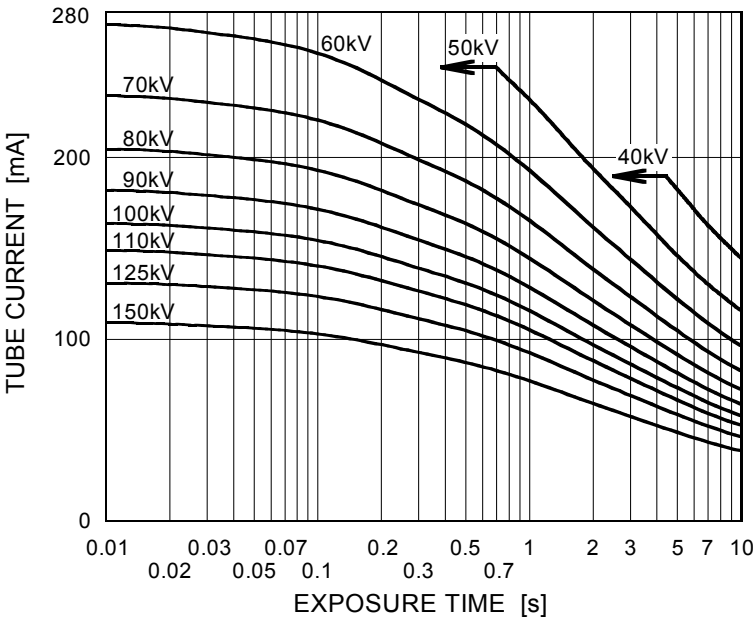
Maximum Rating Charts (Absolute Maximum Rating Charts)

Conditions: Constant Potential High-Voltage Generator
Stator Power Frequency 50Hz

Nominal Focal Spot Value: 1.3 ■



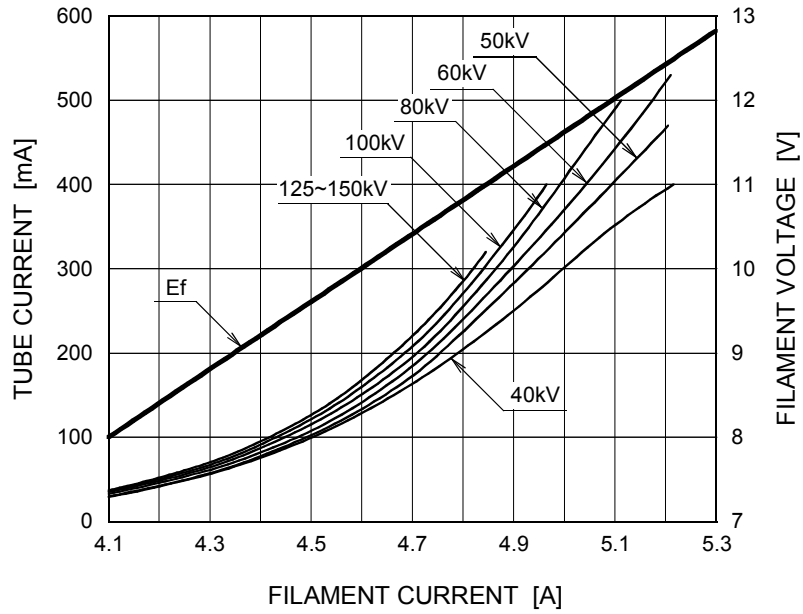
Nominal Focal Spot Value: 0.7 □



Emission & Filament Characteristics

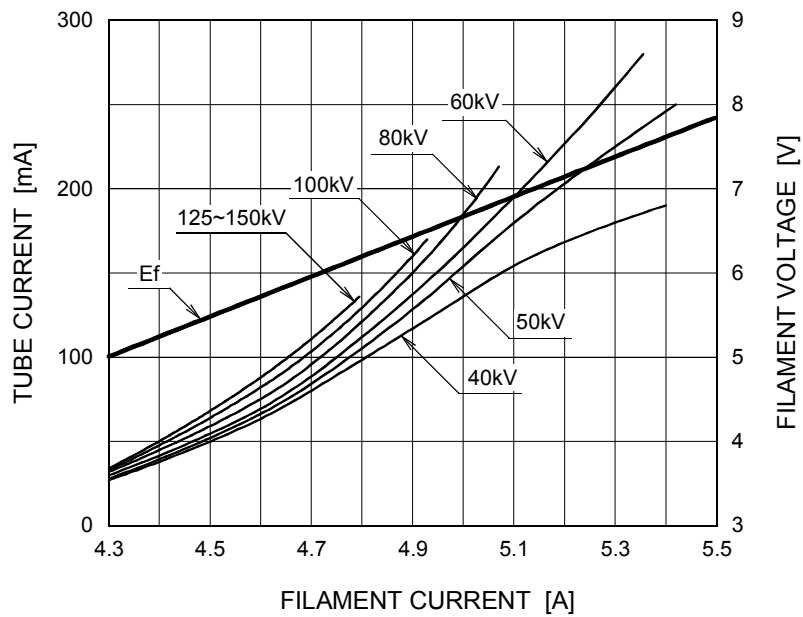
Constant Potential High-Voltage Generator

Nominal Focal Spot Value: 1.3 ■



For Reference Only

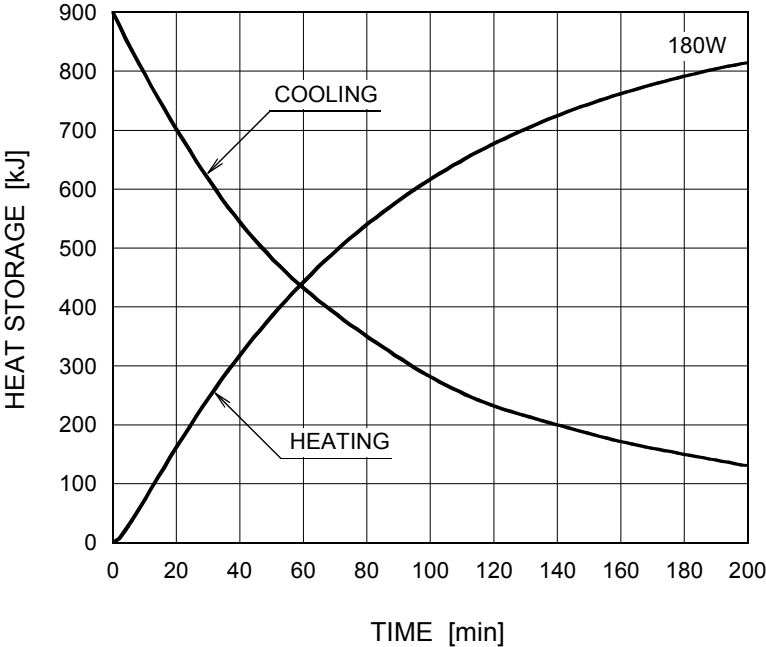
Nominal Focal Spot Value: 0.7 □



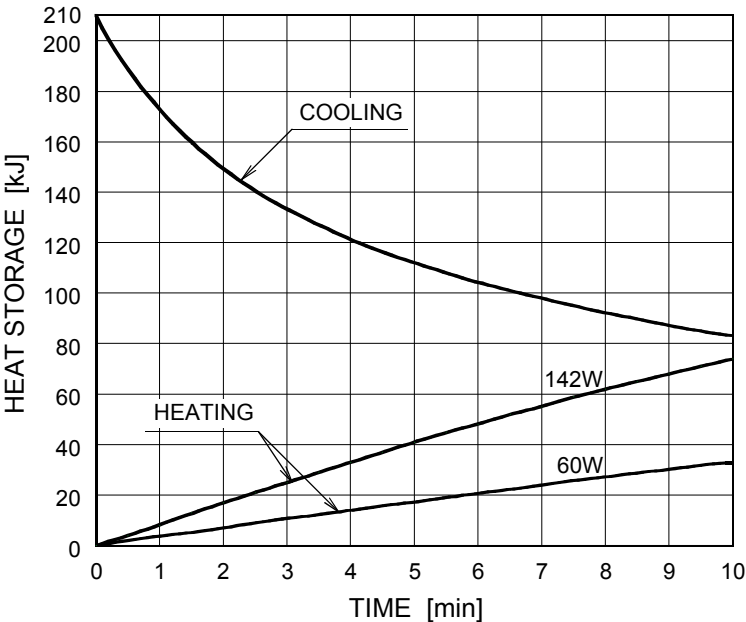
For Reference Only

Thermal Characteristics

X-ray Tube Assembly Heating / Cooling Curve



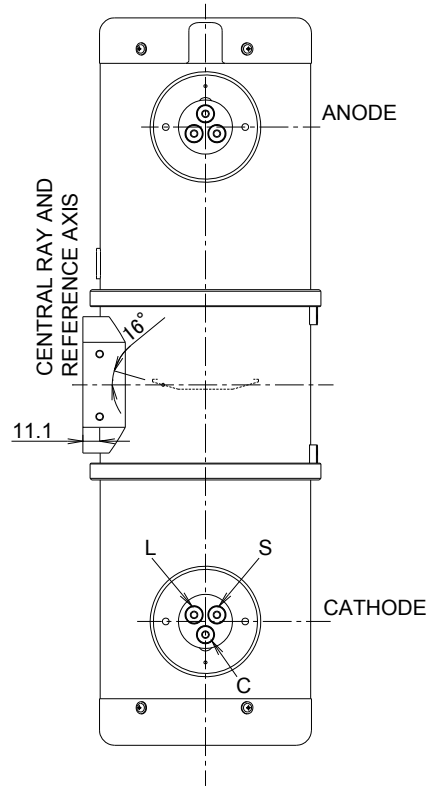
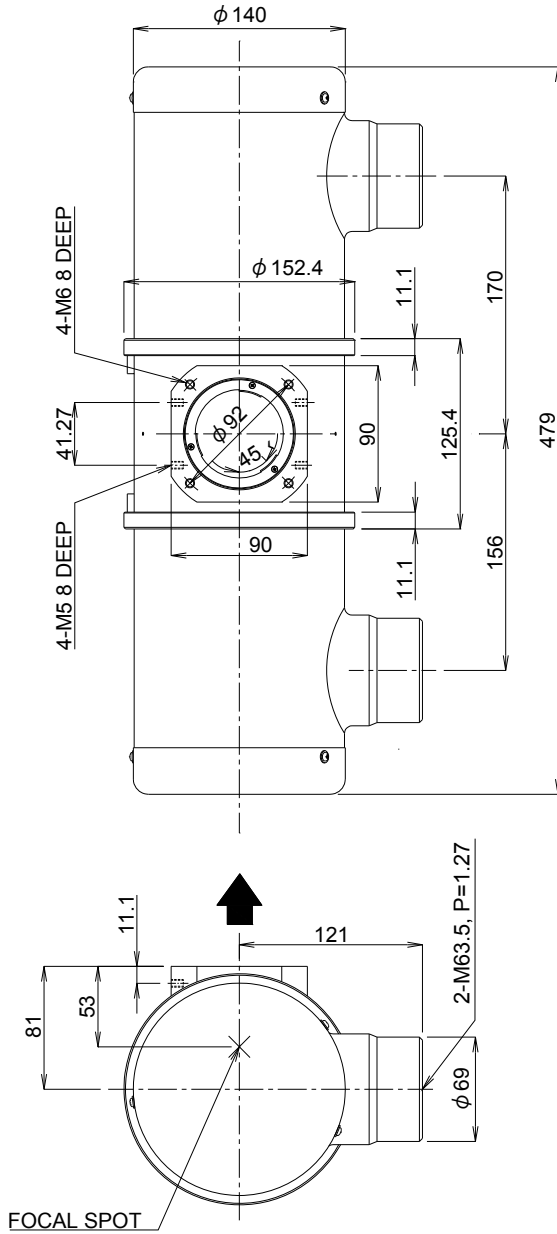
Anode Heating / Cooling Curve



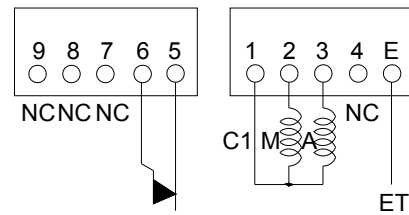
The heating curves are showing example of average input power to anode in operation.

Dimensional Outline of E7886X

Unit mm



TERMINAL CONNECTIONS



TEMPERATURE RELAY (NORMALLY CLOSED)

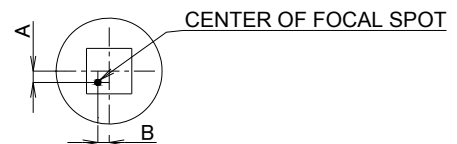
Note) Do not connect terminal No.1 and No.5 or 6 in series circuit.

CATHODE TERMINAL

- C : COMMON
- L : LARGE FOCUS
- S : SMALL FOCUS

TERMINAL CONNECTIONS

- C1 : COMMON
- M : MAIN WINDING OF THE STATOR
- A : AUX. WINDING OF THE STATOR
- NC : NON-CONNECTION
- ET : EARTH TERMINAL

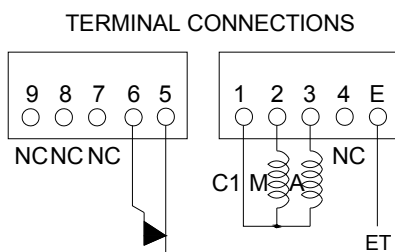
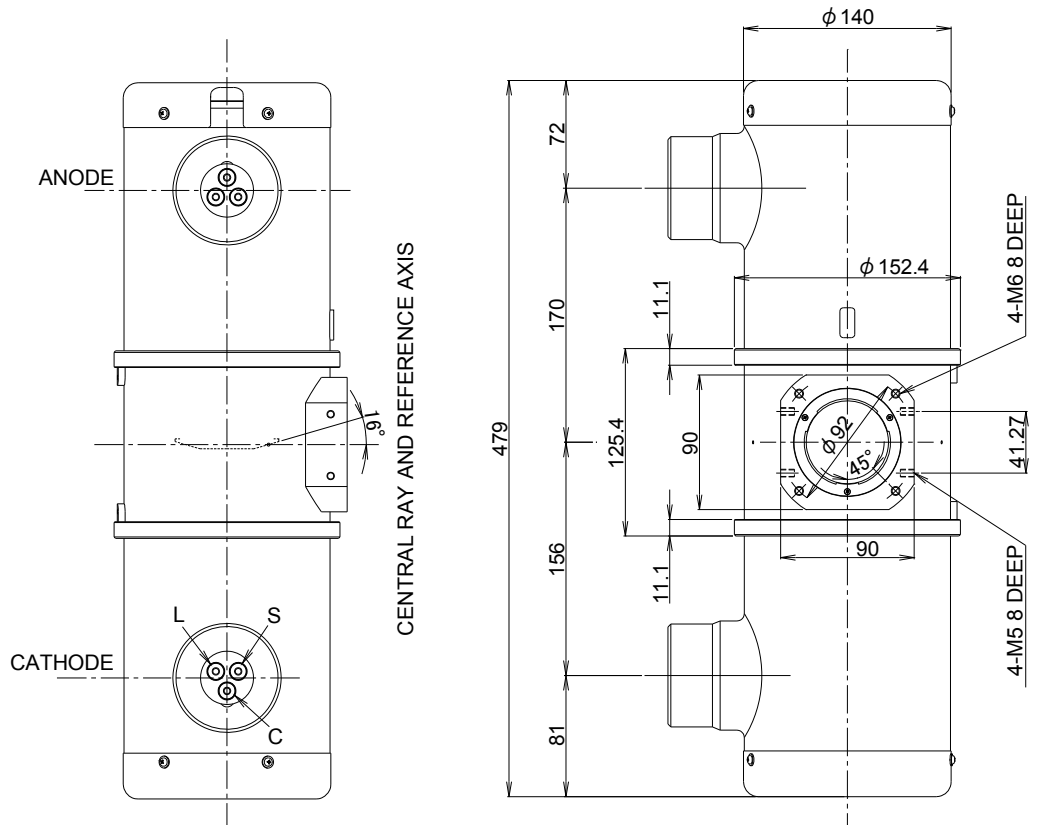


$-1.5\text{mm} \leq A \leq 1.5\text{mm}$
 $-1.5\text{mm} \leq B \leq 1.5\text{mm}$

▲ : CENTRAL X-RAY ANODE & CATHODE TERMINAL : IEC60526 TYPE

Dimensional Outline of E7886FX

Unit mm



TEMPERATURE RELAY
(NORMALLY CLOSED)

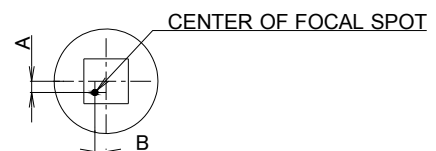
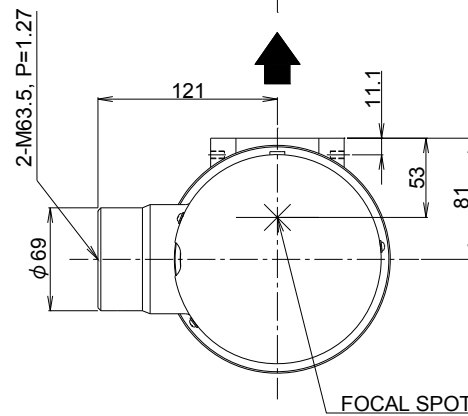
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$-1.5\text{mm} \leq A \leq 1.5\text{mm}$
 $-1.5\text{mm} \leq B \leq 1.5\text{mm}$

▲ : CENTRAL X-RAY
ANODE & CATHODE TERMINAL
: IEC60526 TYPE



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·The head office of Toshiba Electron Tubes & Devices Co., Ltd. has been certified to meet all the requirements of Environmental Management System ISO14001.

·Toshiba Electron Tubes & Devices Co., Ltd. has been certified to meet all the requirements of Quality Management Systems ISO9001 and ISO13485.

Product scope is referred to the following URL. <http://www.toshiba-tetd.co.jp/tetd/eng/company/quality.htm>.