

**ROTANODE™  
E7299X  
E7299FX**

**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 1.0 and 0.3, 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  
 Fluoroscopic ..... 125 kV

Nominal Focal Spot Value:

Large Focus ..... 1.0  
 Small Focus ..... 0.3

Nominal Anode Input Power (at 0.1s):

	60 Hz	50 Hz
Large Focus .....	39 kW	35.5 kW
Small Focus .....	3.7 kW	3.4 kW

Nominal Radiographic Anode Input Power:

	60 Hz	50 Hz
Large Focus .....	38 kW	34 kW
Small Focus .....	3.5 kW	3.2 kW

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**Motor Ratings:**

Stator: XS-AV

		Starting		Running
		50/60		50/60
Driven Frequency	[Hz]	50/60		50/60
Input Power	[W]	1050	270	43
Voltage <sup>1) 3)</sup>	[V]	200	100	40
Current <sup>2)</sup>	[A]	6.0	3.0	1.2
Min. Speed Up <sup>4)</sup>	[s]	0.8	1.5	-
Capacitor	[ $\mu$ F]	24	24	24

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<sup>-1</sup>50 Hz ..... Minimum 2700 min<sup>-1</sup>**Stator Resistance:**Common-Main Winding ..... 27.5  $\Omega$ Common-Auxiliary Winding ..... 58.0  $\Omega$ Resistance between Housing and Low Voltage Terminals ..... Minimum 2 M $\Omega$ 

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 ..... 12 degrees

Diameter ..... 74 mm

Construction ..... Rhenium-Tungsten faced Molybdenum

**Filtration:**

Permanent Filtration ..... 1.3 mm Al / 75 kV IEC60522:1999

Available Additional Filter combination (0.4 - 1.5 mm) ..... Maximum 2.8 mm Al / 75 kV

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

Leakage Technique Factor ..... 150 kV, 3.4 mA

X-ray Coverage ..... 430 × 430 mm at SID 1000 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:**

E7299X ..... XH-121

E7299FX ..... XH-126

## Absolute Maximum and Minimum Ratings (At any time, these values must not be exceeded.)

Maximum X-ray Tube Voltage:	
Radiographic .....	150 kV
Fluoroscopic .....	125 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 .....	640 mA
Small Focus .....	70 mA
Maximum Filament Current:	
Large Focus .....	5.5 A
Small Focus .....	5.0 A
Filament Voltage:	
Large Focus (At maximum filament current 5.5 A) .....	11.1 ~ 15.1 V
Small Focus (At maximum filament current 5.0 A) .....	4.3 ~ 5.8 V
Filament Frequency Limits .....	0 ~ 25 kHz
Continuous Anode Input Power .....	120 W (170 HU/s)
(Fluoroscopic, Radiographic or mixed exposure)	
Thermal Characteristics:	
Anode Heat Content .....	100 kJ (140 kHU)
Maximum Anode Heat Dissipation .....	475 W (667HU/s)
X-ray Tube Assembly Heat Content .....	900 kJ (1250 kHU)
Nominal Continuous Input Power:	
Without Air-circulator .....	180 W (15 kHU/min)

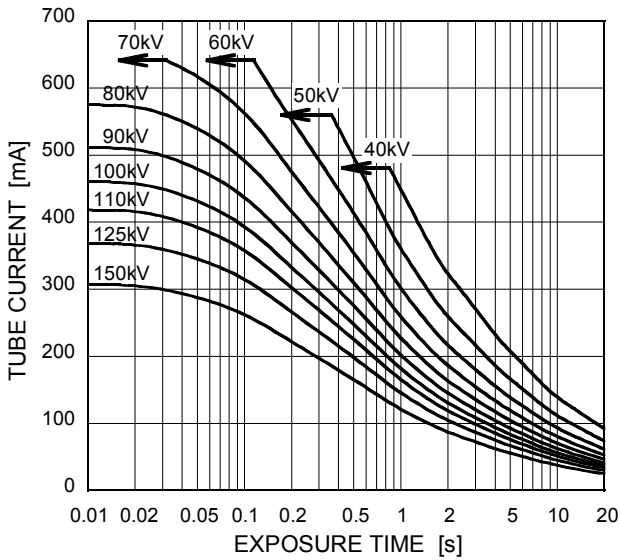
## Environmental Limits

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

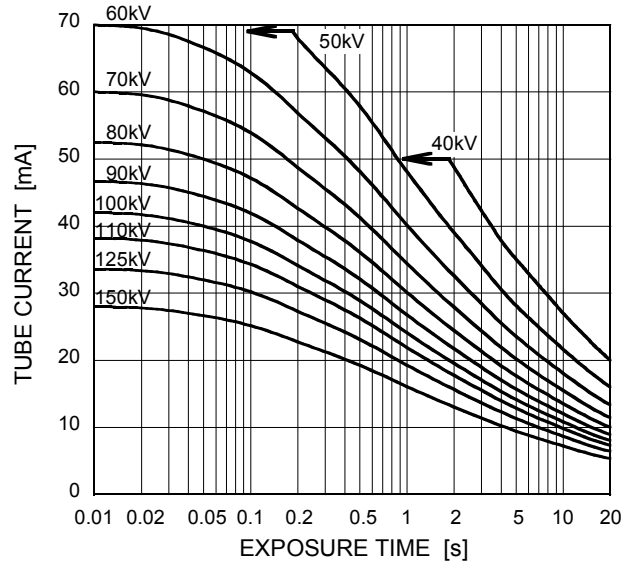
## Maximum Rating Charts (Absolute Maximum Rating Charts)

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

Nominal Focal Spot Value: 1.0 ■

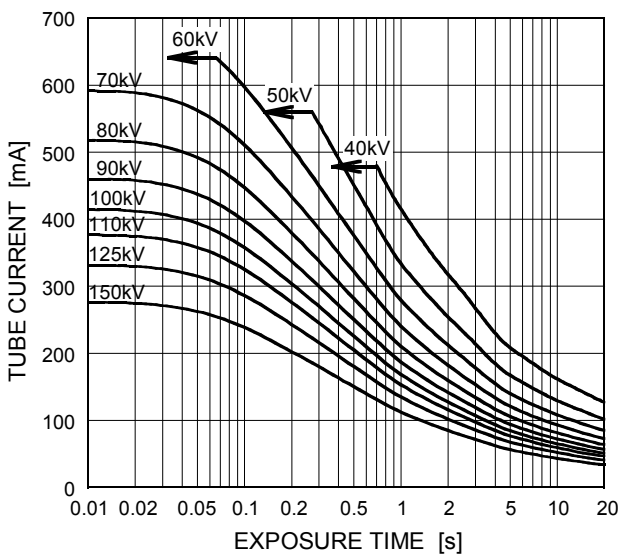


Nominal Focal Spot Value: 0.3 □

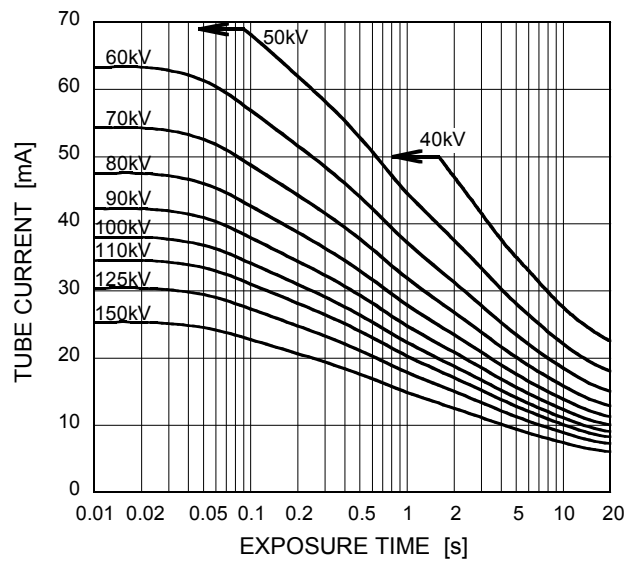


Conditions: Constant Potential High-Voltage Generator  
Stator Power Frequency 50Hz

Nominal Focal Spot Value: 1.0 ■



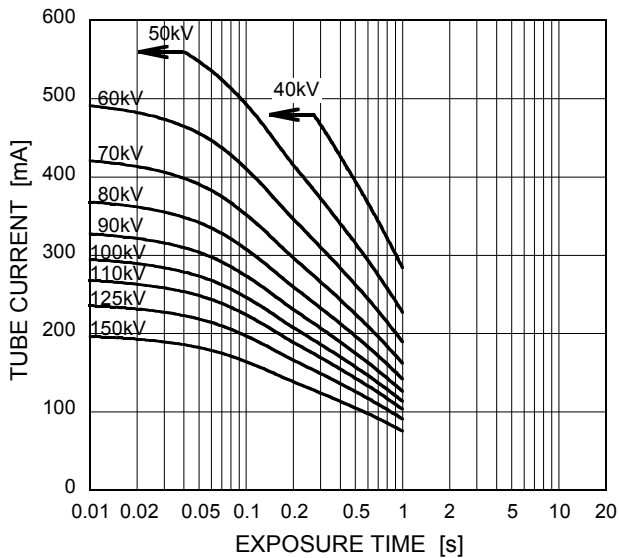
Nominal Focal Spot Value: 0.3 □



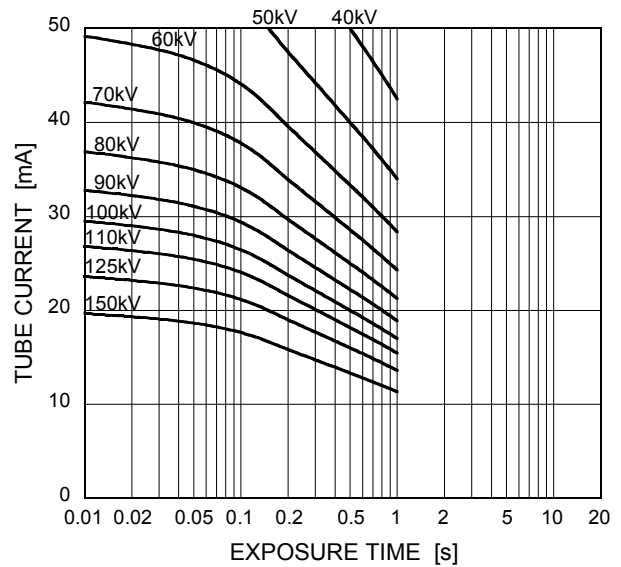
## Maximum Rating Charts (Spot-Film Rating Charts)

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

Nominal Focal Spot Value: 1.0 ■

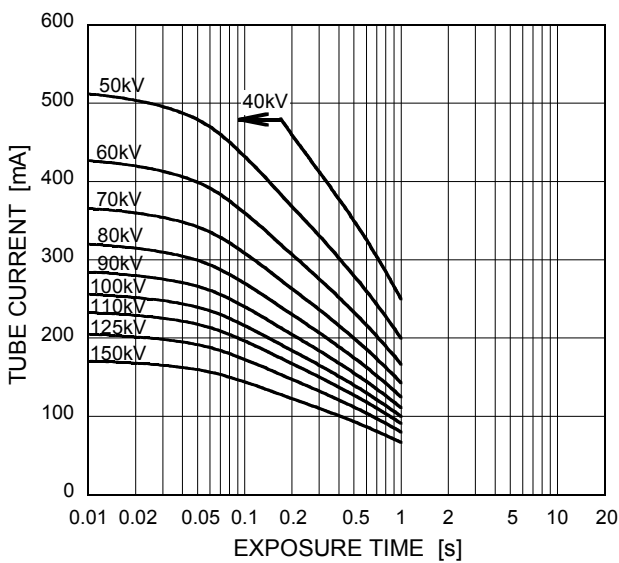


Nominal Focal Spot Value: 0.3 □

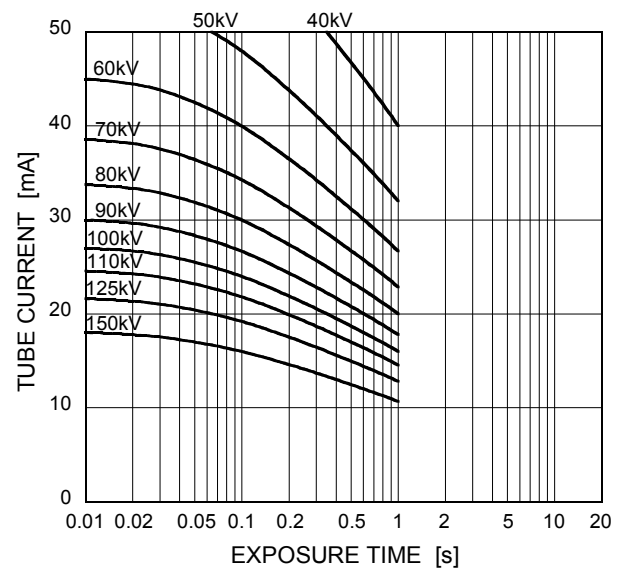


Conditions: Constant Potential High-Voltage Generator  
Stator Power Frequency 50Hz

Nominal Focal Spot Value: 1.0 ■



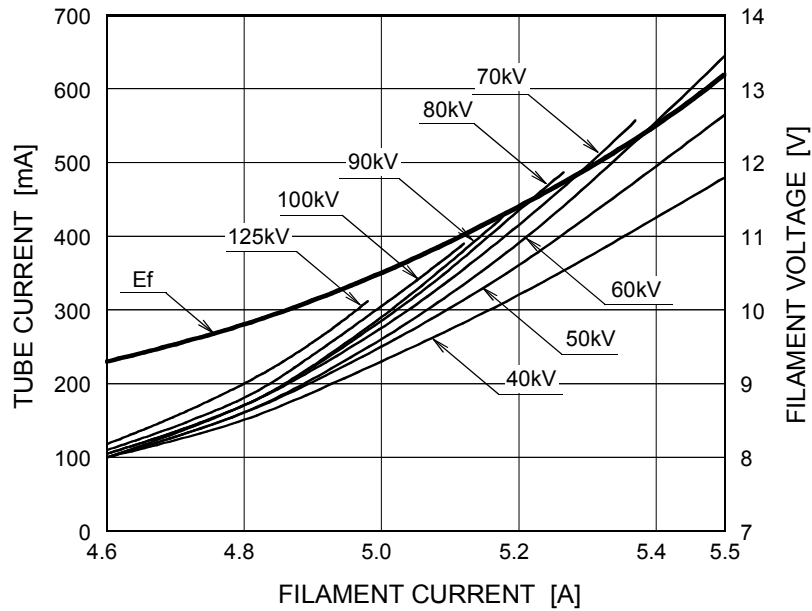
Nominal Focal Spot Value: 0.3 □



## Emission & Filament Characteristics

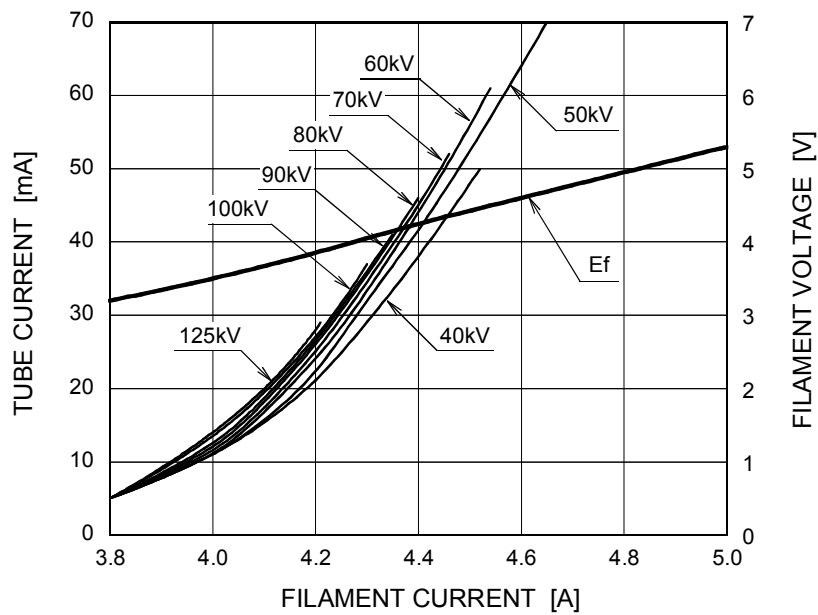
Constant Potential High-Voltage Generator

Nominal Focal Spot Value: 1.0 ■



For Reference Only

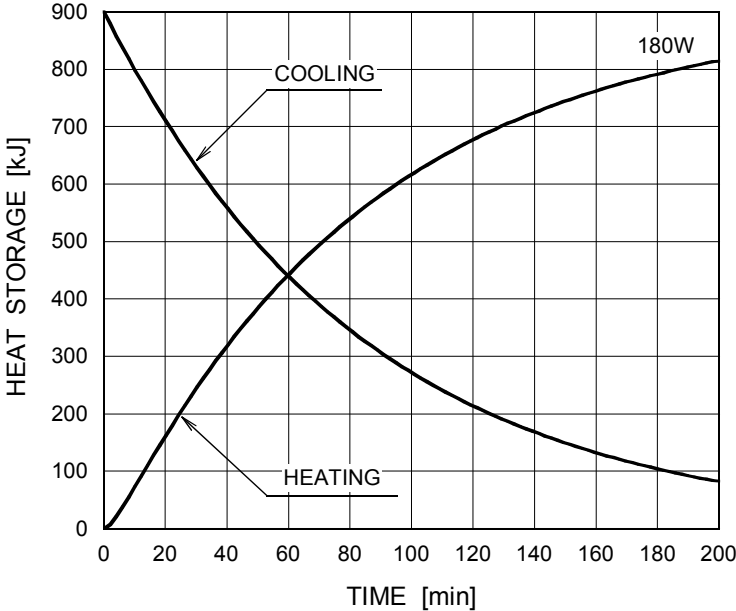
Nominal Focal Spot Value: 0.3 □



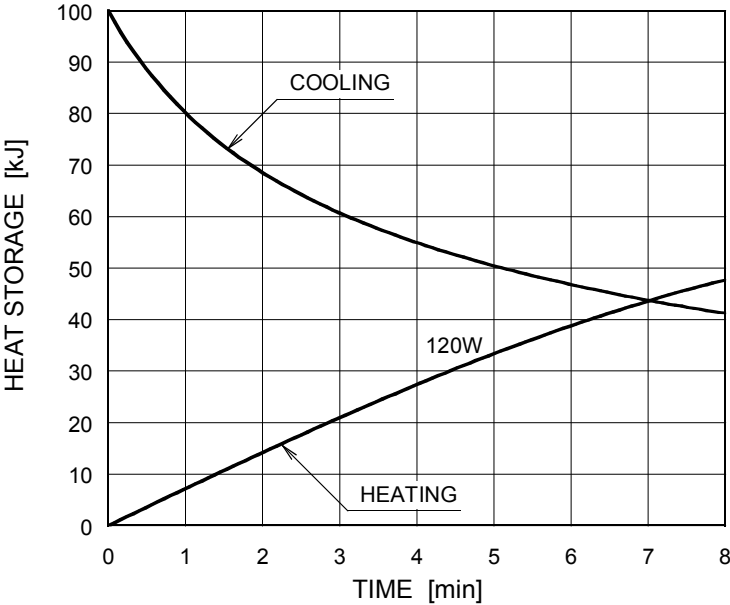
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### Thermal Characteristics

X-ray Tube Assembly Heating / Cooling Curve



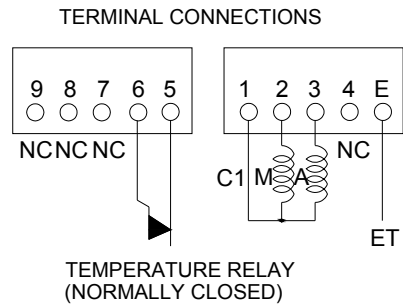
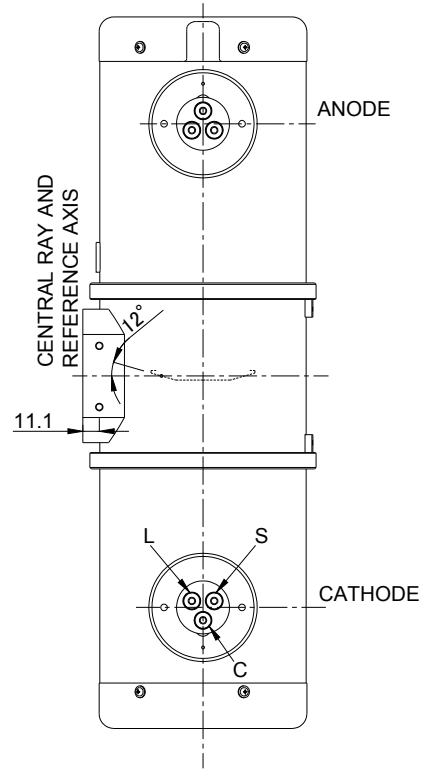
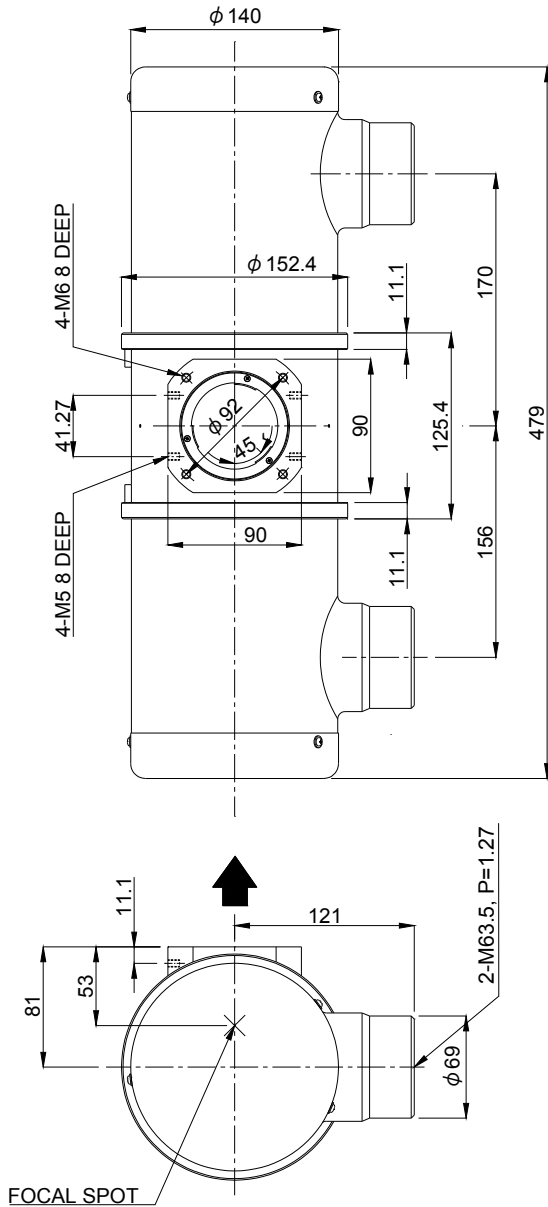
Anode Heating / Cooling Curve



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

### Dimensional Outline of E7299X

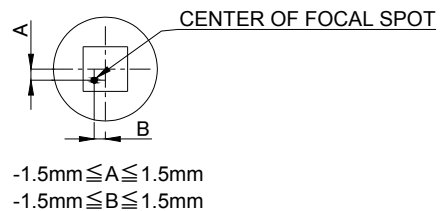
Unit: mm



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

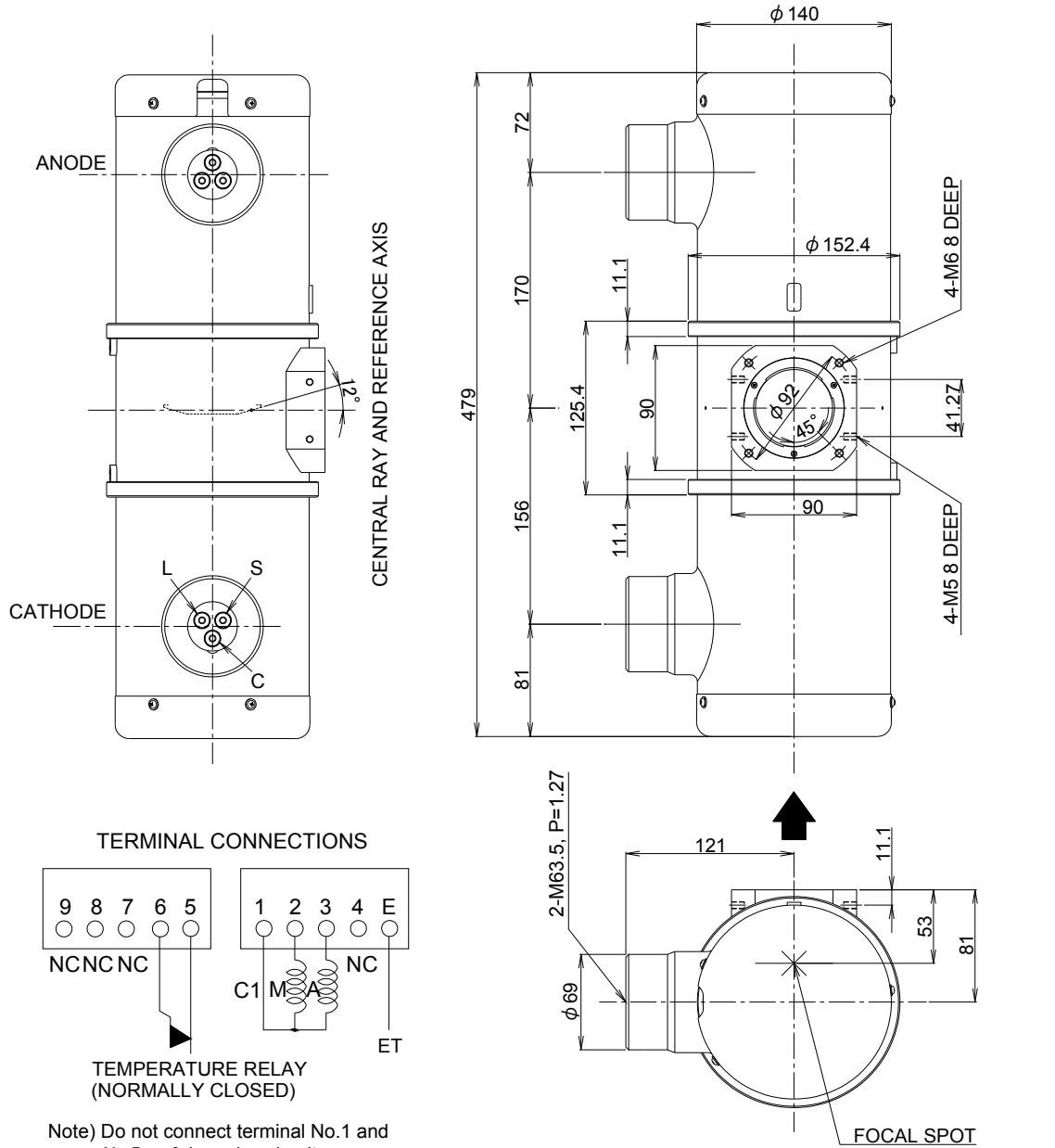


▲ : CENTRAL X-RAY  
 ANODE & CATHODE TERMINAL : IEC60526 TYPE



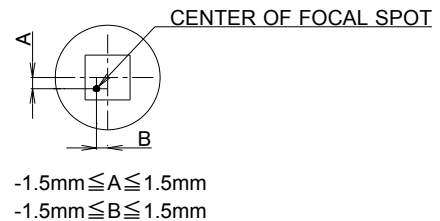
### Dimensional Outline of E7299FX

Unit: mm



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



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

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·Canon 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. <https://etd.canon/eng/company/quality.htm>.