

ROTANODE™

E7254X
E7254FX
E7254GX

Rotating Anode X-ray Tube Assembly

- ◆ High speed rotating anode X-ray tube assembly for high energy radiographic and cine-fluoroscopic operations.
- ◆ The heavy anode is constructed with specially processed Rhenium-tungsten faced molybdenum target which have an improved coating to increase thermal emissivity.
- ◆ These tubes have foci 1.2 and 0.6, and are available for a maximum tube voltage 150kV.
- ◆ 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 1.2
 Small Focus 0.6

Nominal Anode Input Power (at 0.1s):

	180 Hz	60 Hz	50 Hz
Large Focus	102 kW	60 kW	55 kW
Small Focus	40 kW	23 kW	21.5 kW

Nominal Radiographic Anode Input Power:

	180 Hz	60 Hz	50 Hz
Large Focus	82 kW	47 kW	43 kW
Small Focus	32 kW	18 kW	17 kW

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Motor Ratings:

Stator: XS-RB

		Starting		Running	
Driven Frequency	[Hz]	180	60	180	60
Input Power	[W]	3500	1520	90	80
Voltage ^{2) 4)}	[V]	490	300	165	160
Current ³⁾	[A]	9.0	7.6	1.3	1.1
Min. Speed Up ⁶⁾	[s]	2.0	1.0	-	-
Capacitor	[μF]	6	30	6	30
Min. Braking ^{2) 6)}	[s]	2.5 s / 300 V (DC)			

Note: 1) To be applied for high speed rotation.

2) Applied voltage between common and main terminal.

3) Common current.

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

5) No more than two high speed starts per minute are permissible.

6) The speed-up and braking time are allowed up to 110% of the above specification.

Anode Speed:

180 Hz	Minimum 9700 min ⁻¹
60 Hz	Minimum 3200 min ⁻¹
50 Hz	Minimum 2700 min ⁻¹

Stator Resistance:

Common-Main Winding	20.2 Ω
Common-Auxiliary Winding	38.0 Ω
Resistance between Housing and Low Voltage Terminals	Minimum 2 MΩ
Normal Operating Range of the Housing Temperature	16 ~ 75 °C
Thermal Switch	Normally Closed
Open	75 ~ 85 °C
Closed	45 ~ 65 °C
Mode of Operation	Intermittent

Mechanical:

Dimensions	See dimensional outline
Overall Length	463 mm
Maximum Diameter	172 mm
Target:	
Anode Angle	12 degrees
Diameter	100 mm
Construction	Rhenium-Tungsten faced molybdenum
Filtration:	
Permanent Filtration	0.8 mm Al / 75 kV IEC60522:1999
Available Additional Filter combination (0.4 - 1.5 mm)	Maximum 2.3 mm Al / 75 kV
Radiation Protection (In accordance with IEC60601-1-3:2008):	
Leakage Technique Factor	150 kV, 5 mA
X-ray Coverage	430 × 430 mm at SID 1000 mm
Weight (Approx.)	20 kg
High Voltage Receptacle	To meet the requirements of IEC60526 Corrigendum1:2010
Cooling Method	Natural or forced air
Tube Housing Model Number	XH-157

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	1000 mA
Small Focus	500 mA

Maximum Filament Current:

Large Focus	5.5 A
Small Focus	5.2 A

Filament Voltage:

Large Focus (At maximum filament current 5.5 A)	12.7 ~ 17.1 V
Small Focus (At maximum filament current 5.2 A)	7.0 ~ 9.4 V

Filament Frequency Limits 0 ~ 25 kHz

Continuous Anode Input Power 300 W (423 HU/s)
(Fluoroscopic, Radiographic or mixed exposure)

Thermal Characteristics:

Anode Heat Content	285 kJ (400 kHU)
Maximum Anode Heat Dissipation	1180 W (1664 HU/s)
X-ray Tube Assembly Heat Content	950 kJ (1339 kHU)
Nominal Continuous Input Power:	
Without Air-circulator	200 W (16 kHU/min)

Environmental Limits

Operating Limits:

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

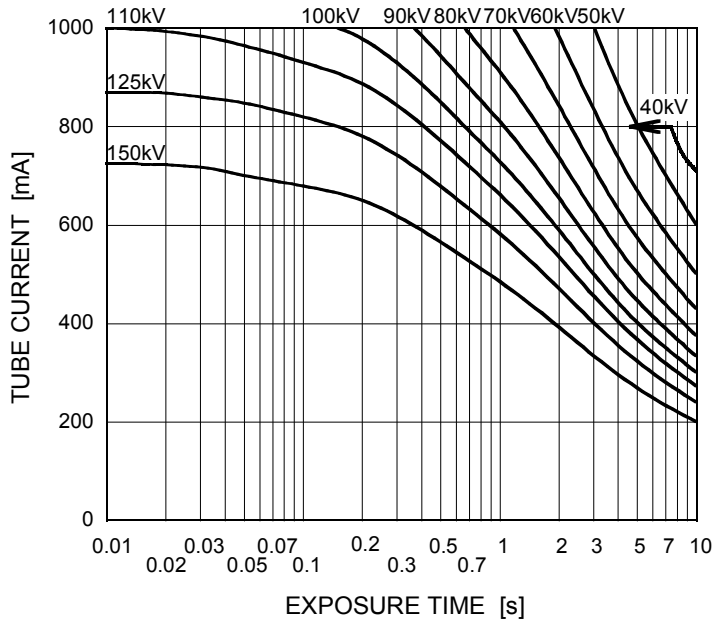
Shipping and Storage Limits:

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

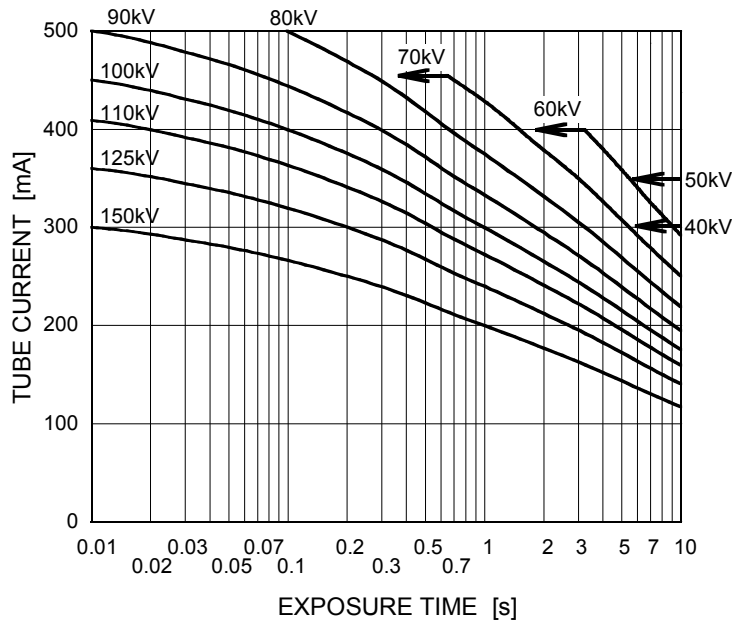
Maximum Rating Charts (Absolute Maximum Rating Charts)

Conditions: Tube Voltage
Constant Potential High-Voltage Generator
Stator Power Frequency 180 Hz

Nominal Focal Spot Value: 1.2 ■



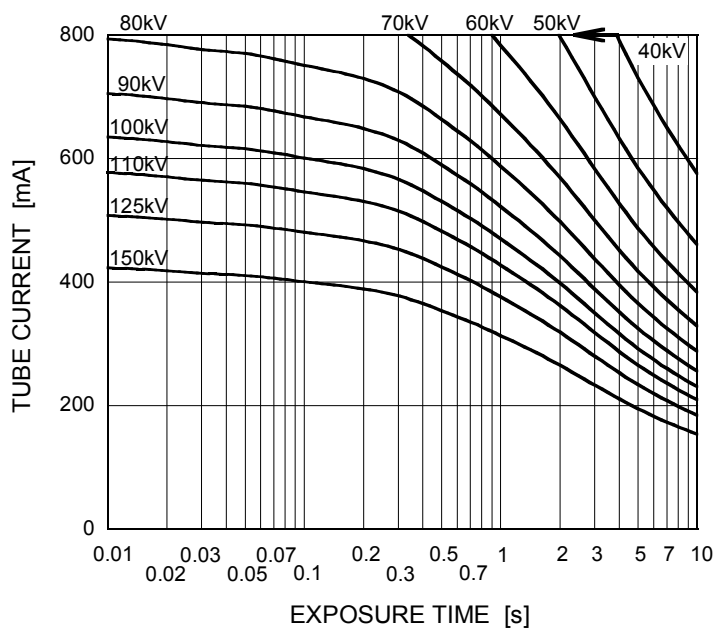
Nominal Focal Spot Value: 0.6 □



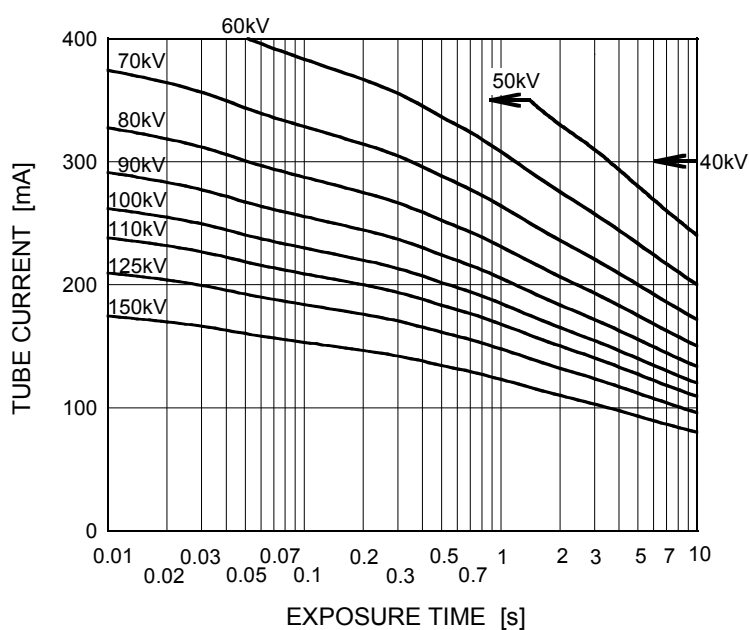
Maximum Rating Charts (Absolute Maximum Rating Charts)

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

Nominal Focal Spot Value: 1.2 ■



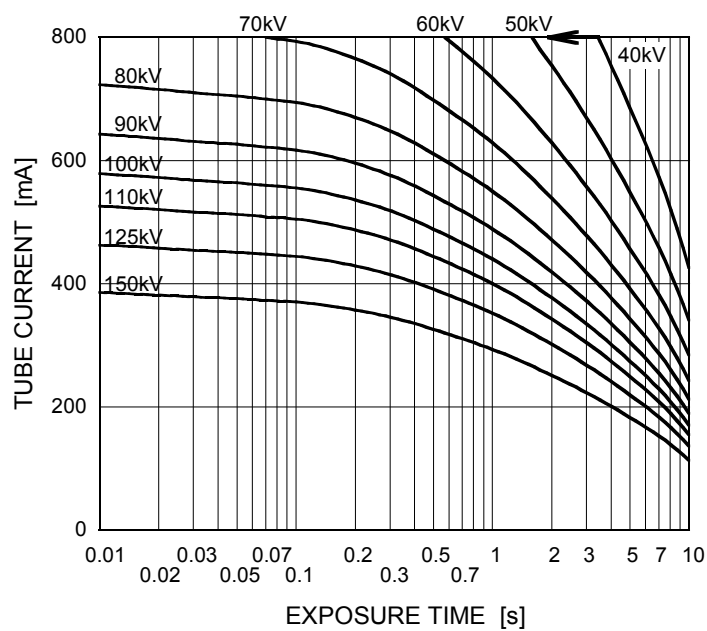
Nominal Focal Spot Value: 0.6 □



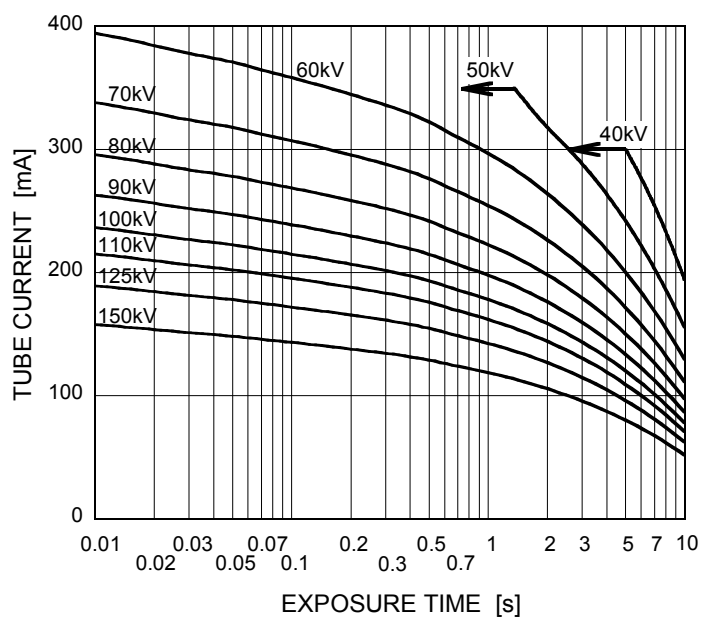
Maximum Rating Charts (Absolute Maximum Rating Charts)

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

Nominal Focal Spot Value: 1.2 ■



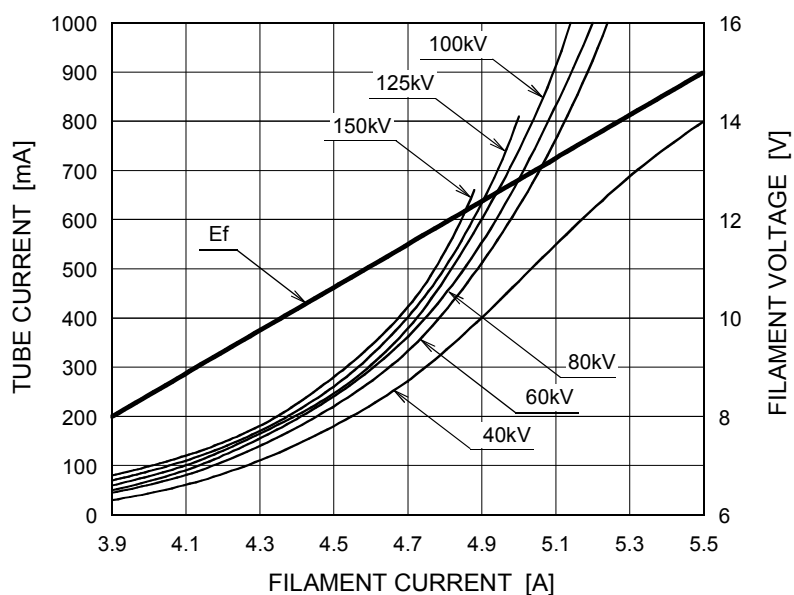
Nominal Focal Spot Value: 0.6 □



Emission & Filament Characteristics

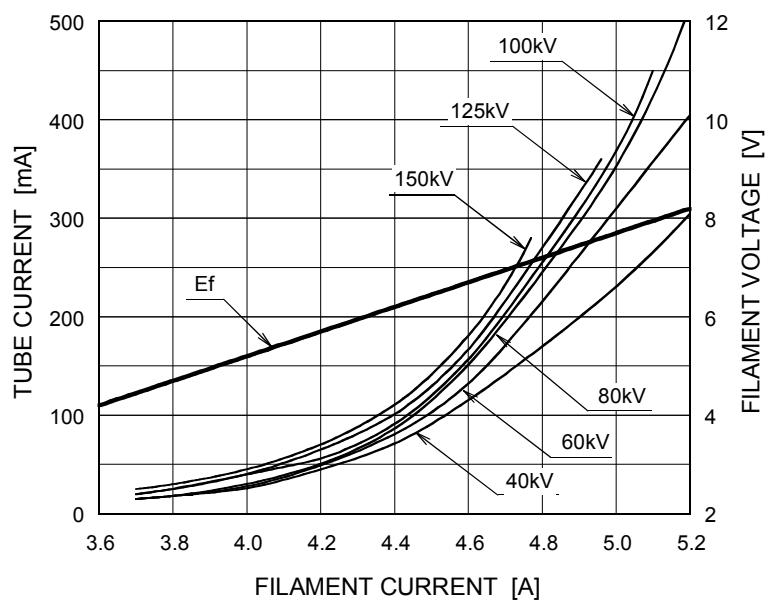
Constant Potential High-Voltage Generator

Nominal Focal Spot Value: 1.2 ■



For Reference Only

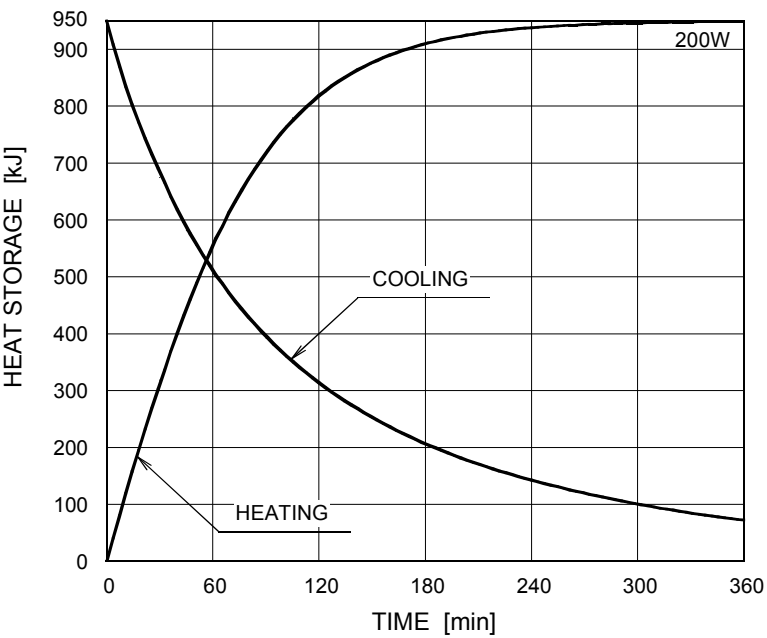
Nominal Focal Spot Value: 0.6 □



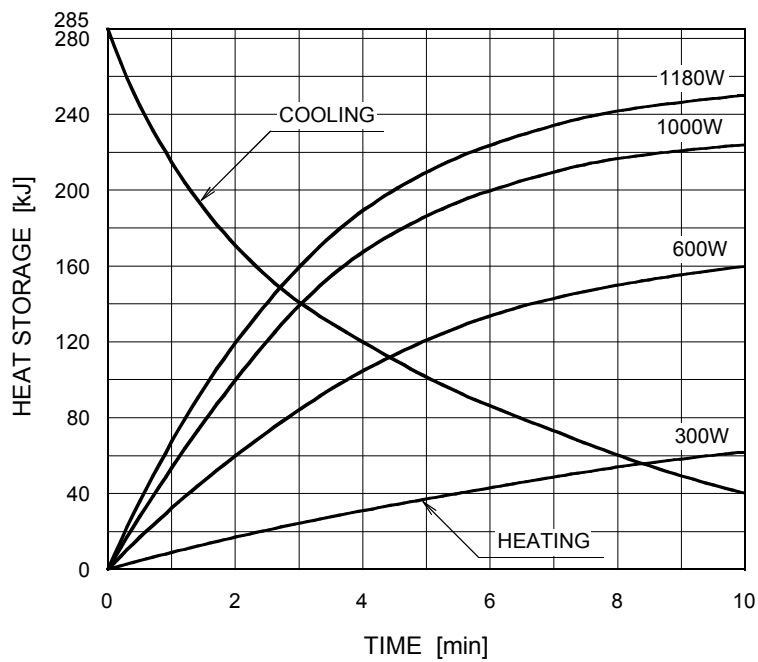
For Reference Only

Thermal Characteristics

X-ray Tube Assembly Heating / Cooling Curve



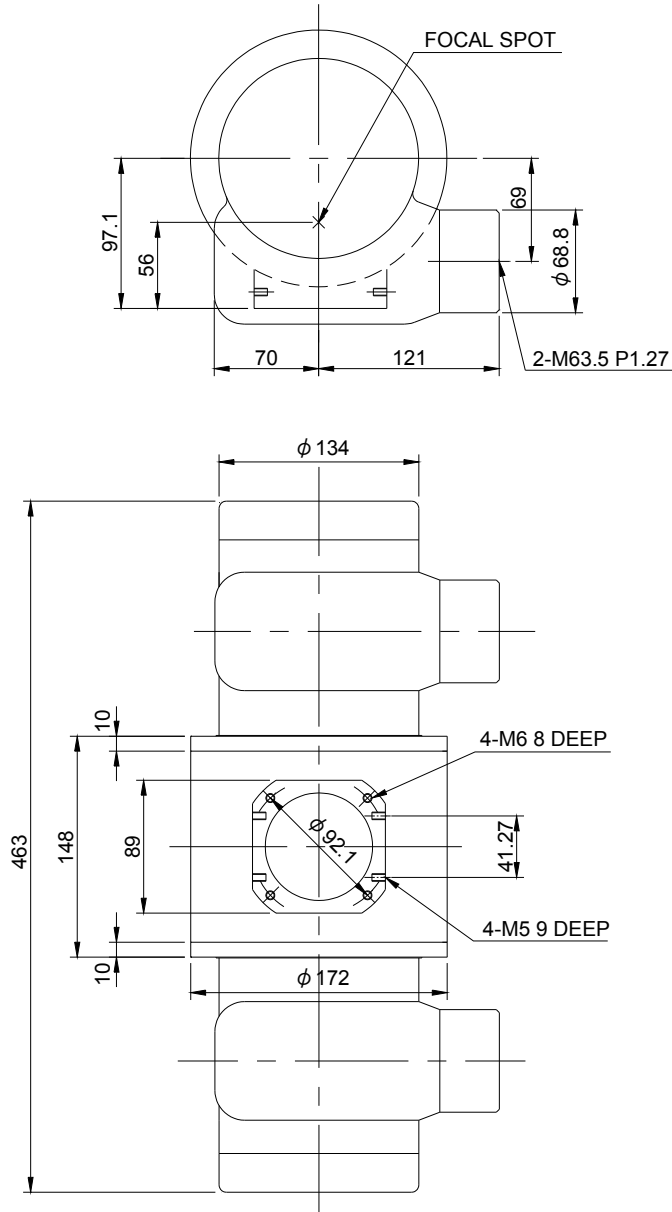
Anode Heating / Cooling Curve



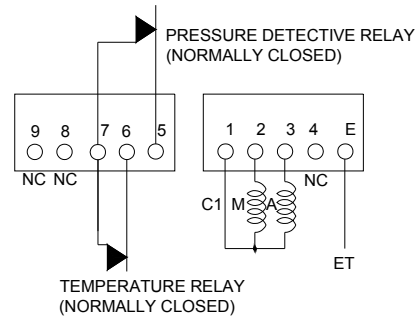
The heating curves are showing examples of average input power to the anode in operation.

Dimensional Outline of E7254X

Unit mm

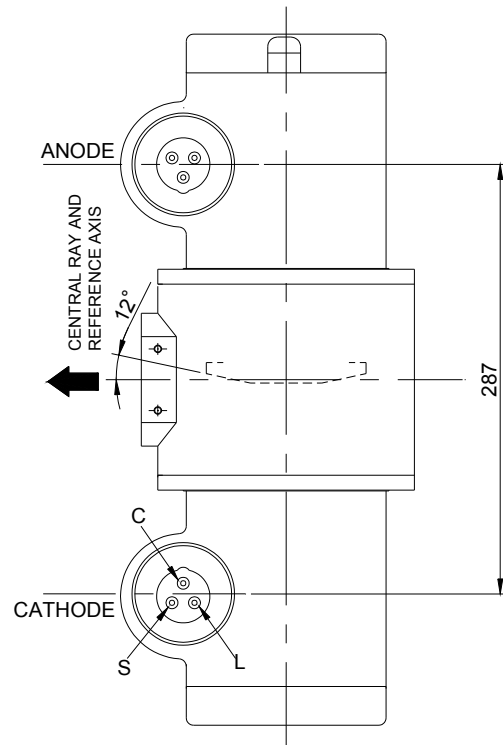


TERMINAL CONNECTIONS



Note

- 1) Make an input-power protection circuit with the terminals No.5 and No.6.
- 2) Do not connect terminal No.1 and No.5 or 6 in series circuit.



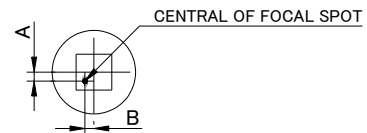
EXPLANATION OF SYMBOLS

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



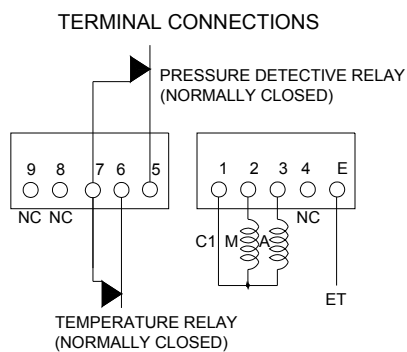
$$-1.5\text{mm} \leq A \leq 1.5\text{mm}$$

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

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

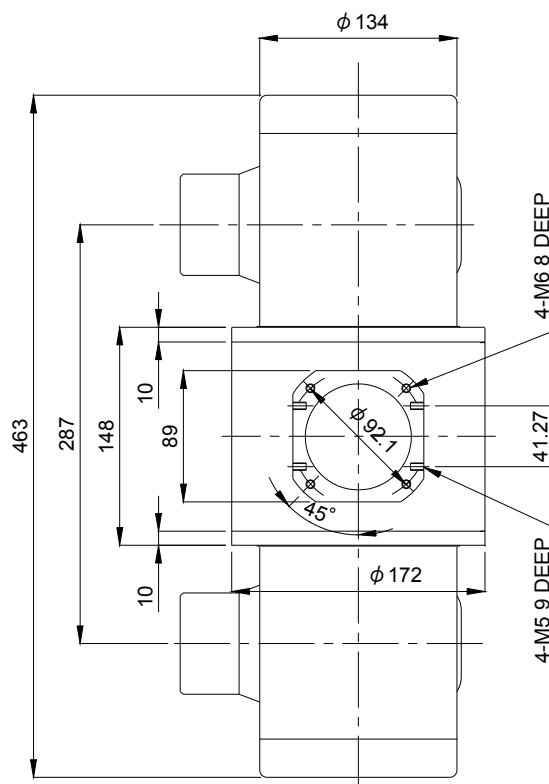
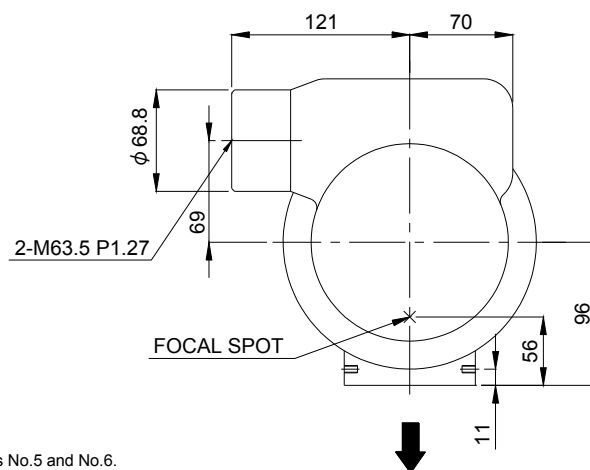
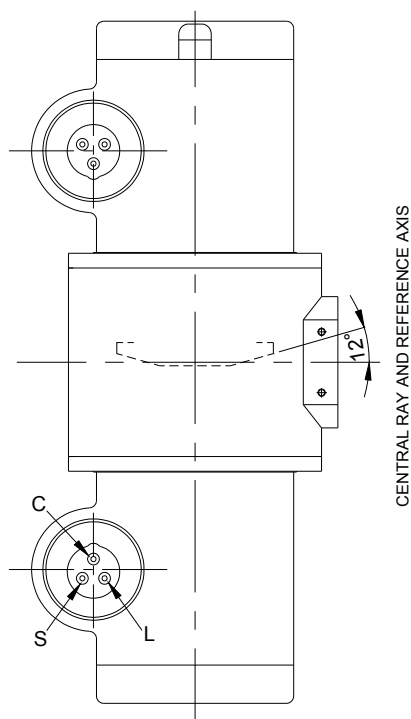
Dimensional Outline of E7254FX

Unit mm



Note

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



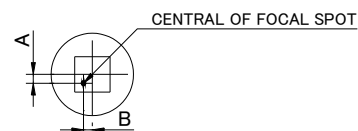
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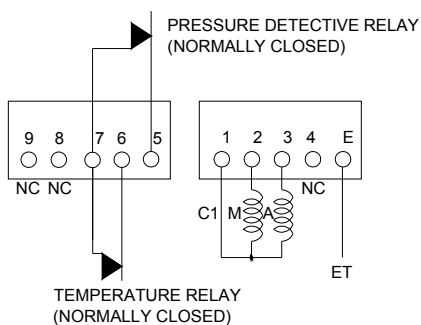
- $-1.5\text{mm} \leq A \leq 1.5\text{mm}$
 $-1.5\text{mm} \leq B \leq 1.5\text{mm}$

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

Dimensional Outline of E7254GX

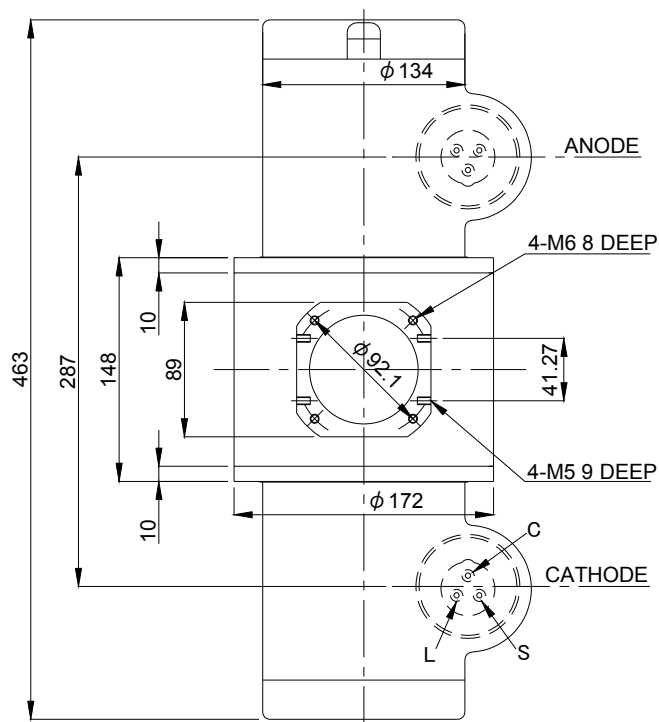
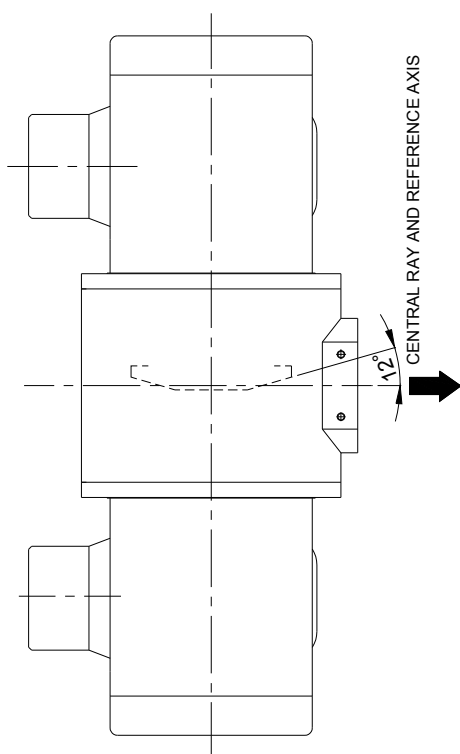
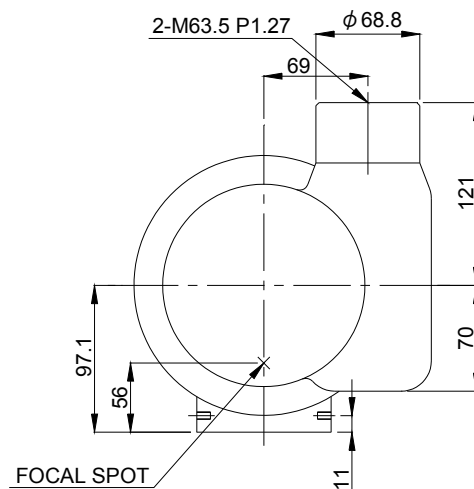
Unit mm

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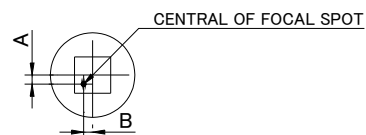
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ANODE & CATHODE TERMINAL
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