ROTANODE™
E7254X
E7254FX
E7254GX

Rotating Anode X-ray Tube Assembly

1.1.9

- 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

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 ℃
Thermal Switch ..... Normally Closed
Open ..... 75 ~ 85 ℃
Closed ..... 45 ~ 65 ℃
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

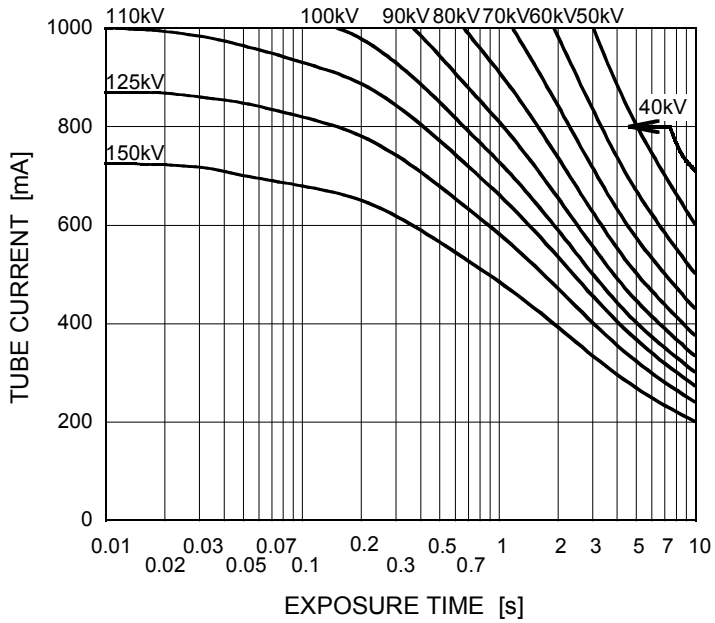
Operating Limits:
- Temperature ..... 10 ~ 40 ℃
- Humidity ..... 30 ~ 85 %
  (No condensation)
- Atmospheric Pressure ..... 70 ~ 106 kPa

Shipping and Storage Limits:
- Temperature ..... -20 ~ 70 ℃
- Humidity ..... 20 ~ 90 %
  (No condensation)
- Atmospheric Pressure ..... 50 ~ 106 kPa

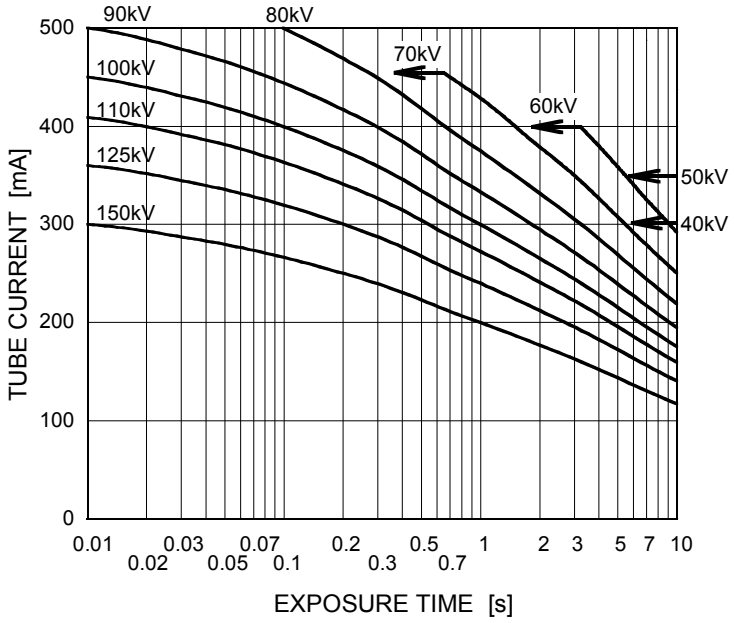
Maximum Rating Charts
(Absolute Maximum Rating Charts)

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

Nominal Focal Spot Value: 1.2 ■



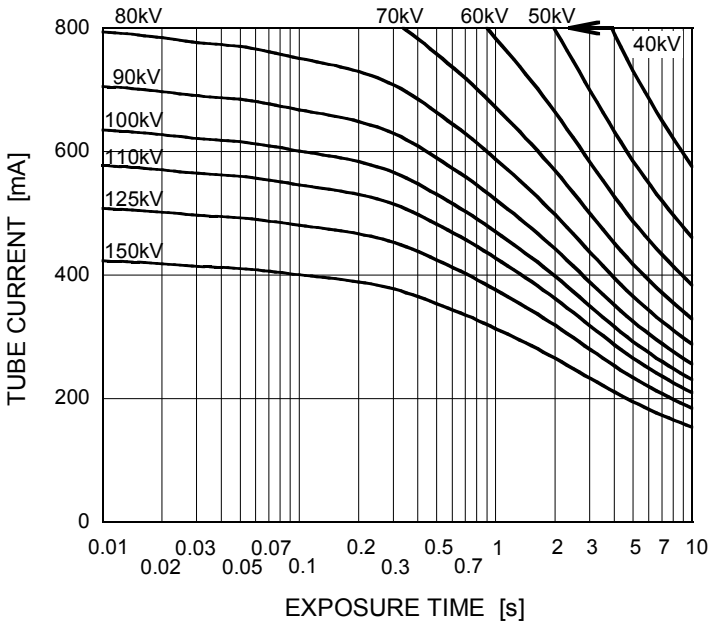
Nominal Focal Spot Value: 0.6 ▣



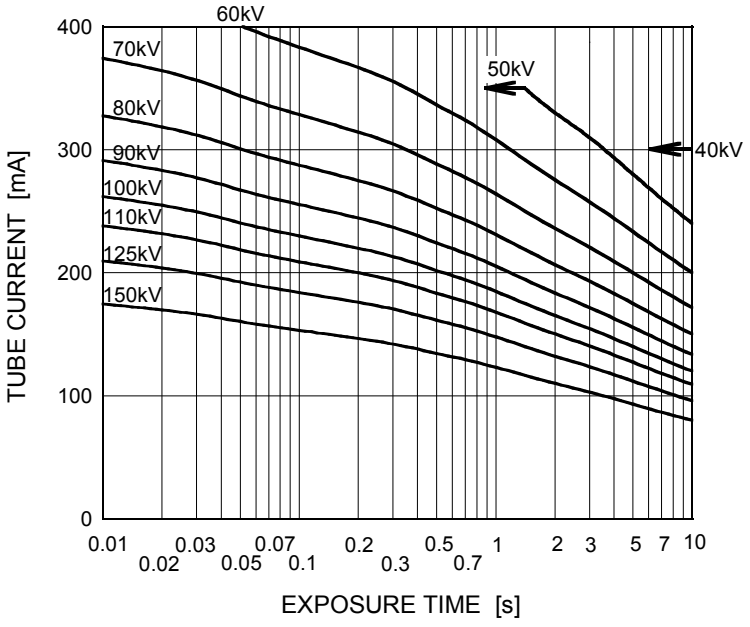
Maximum Rating Charts
(Absolute Maximum Rating Charts)

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

Nominal Focal Spot Value: 1.2 ■



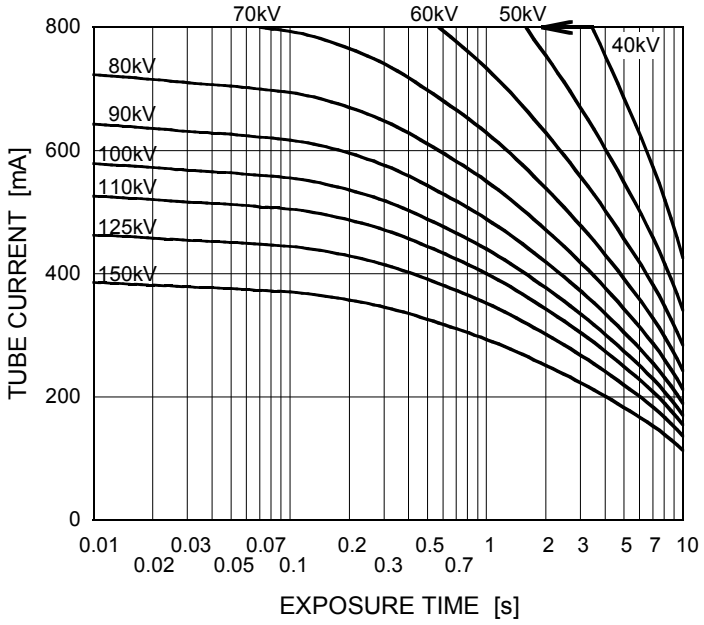
Nominal Focal Spot Value: 0.6 ▣



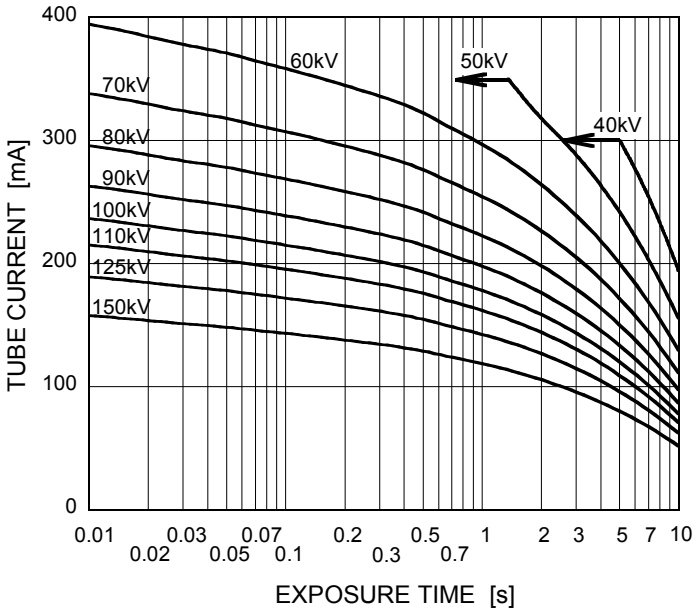
Maximum Rating Charts
(Absolute Maximum Rating Charts)

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

Nominal Focal Spot Value: 1.2 ■



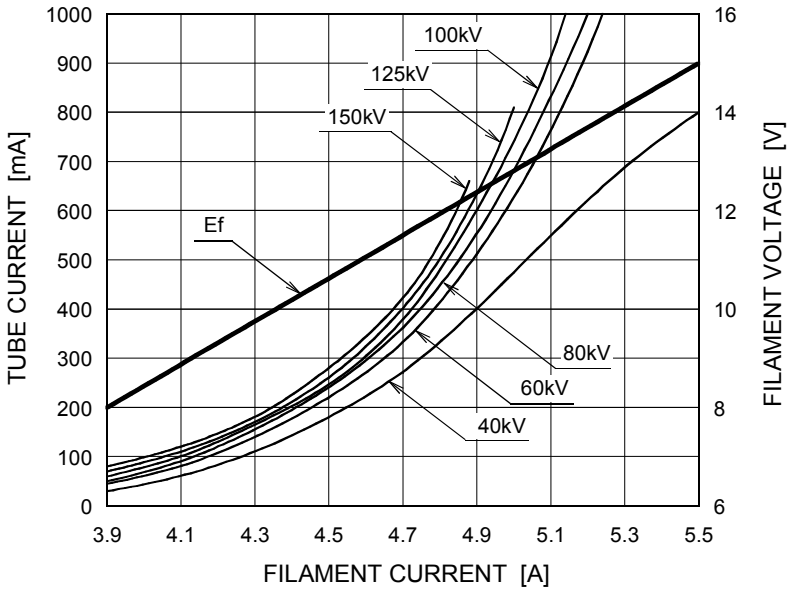
Nominal Focal Spot Value: 0.6 ▣



Emission & Filament Characteristics

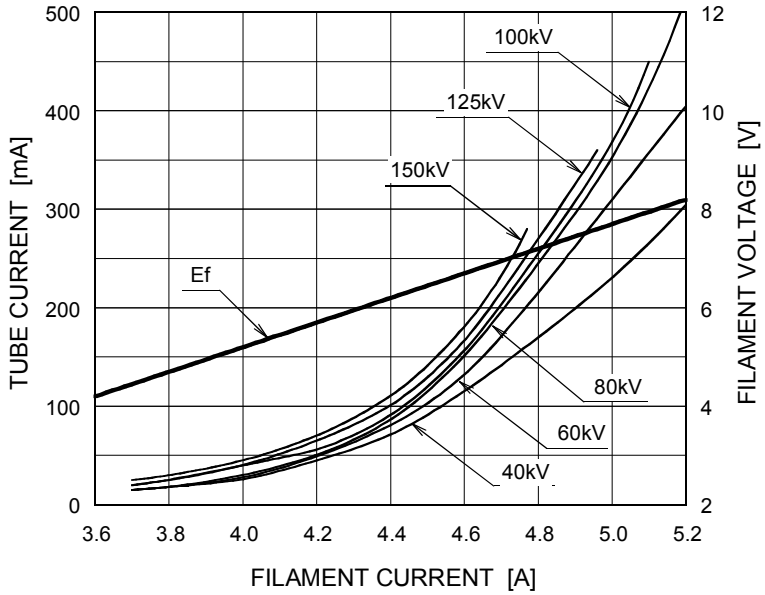
Constant Potential High-Voltage Generator

Nominal Focal Spot Value: 1.2 ■



For Reference Only

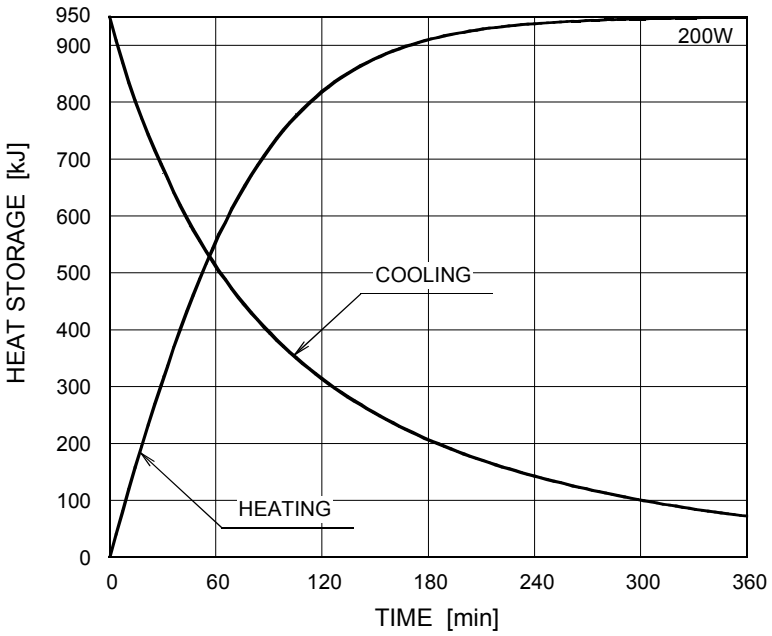
Nominal Focal Spot Value: 0.6 ▣



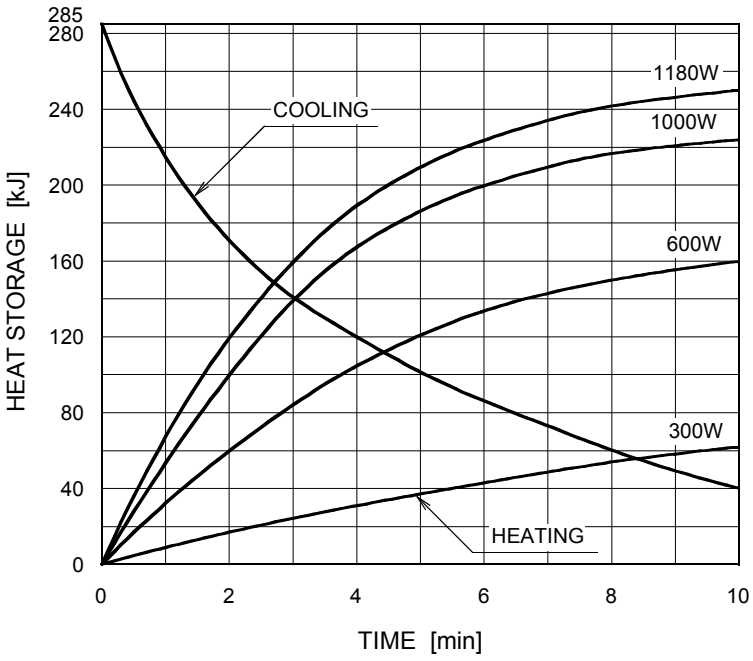
For Reference Only

Thermal Characteristics

X-ray Tube Assembly Heating / Cooling Curve



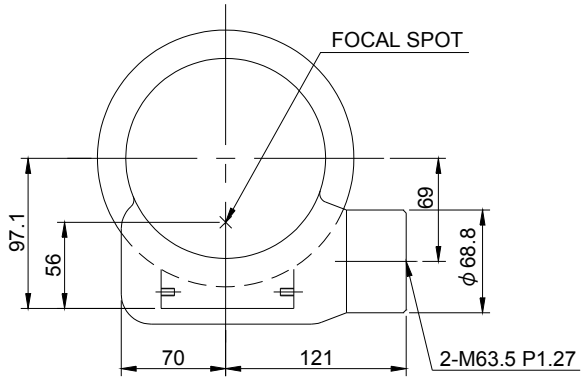
Anode Heating / Cooling Curve



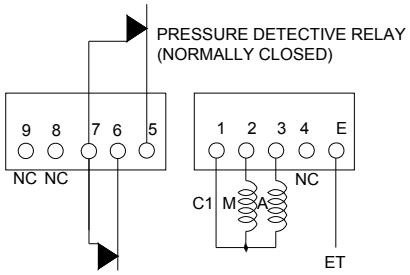
The heating curves are showing examples of average input power to the anode in operation.

Dimensional Outline of E7254X

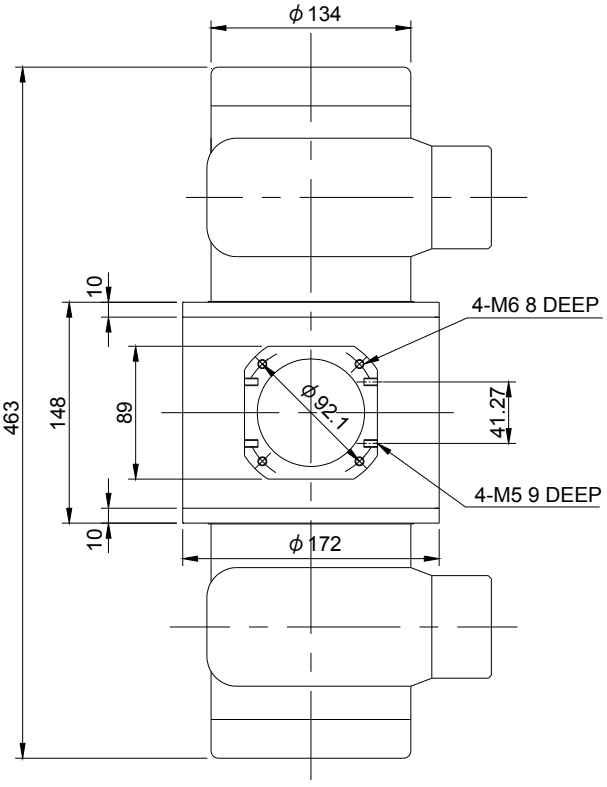
Unit mm

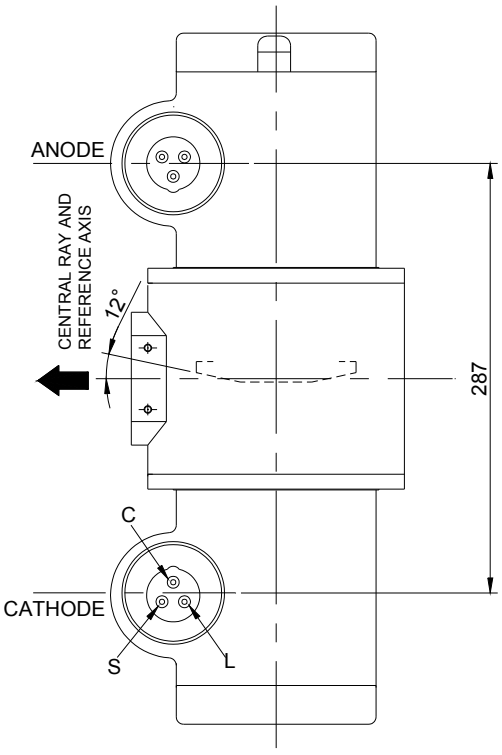


TERMINAL CONNECTIONS



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
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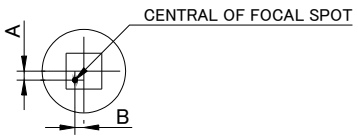
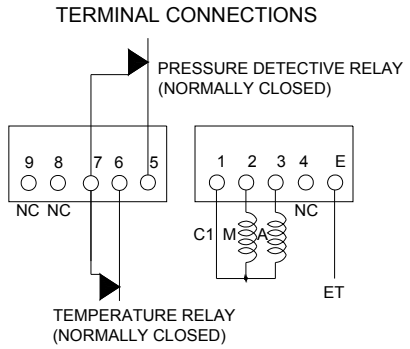


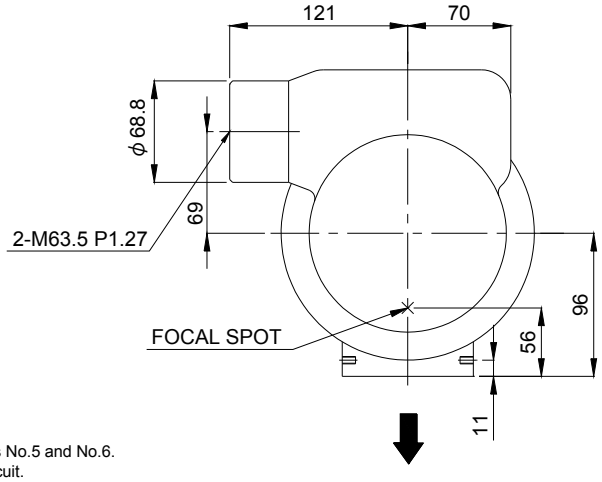
−1.5mm≦A≦1.5mm
−1.5mm≦B≦1.5mm

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

Dimensional Outline of E7254FX

Unit mm





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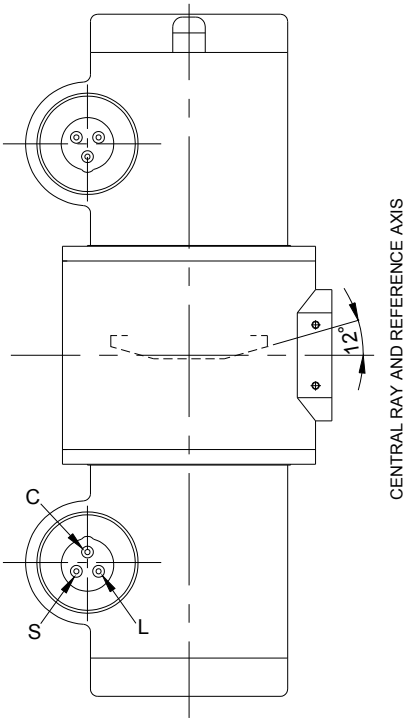

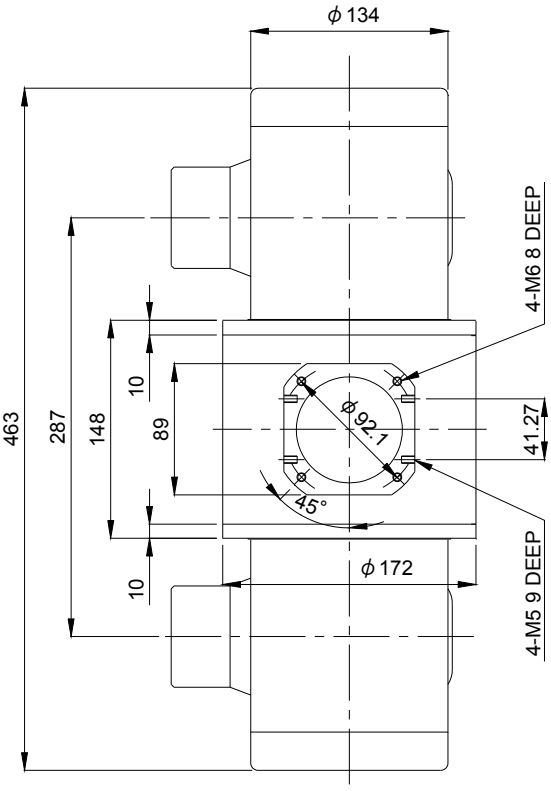

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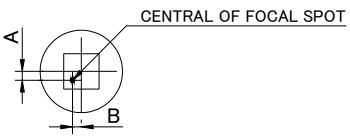

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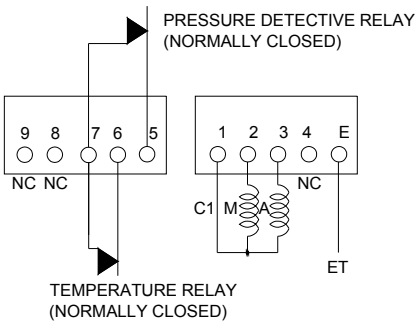

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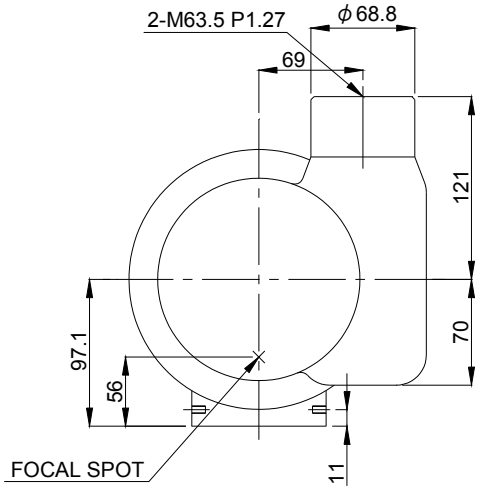

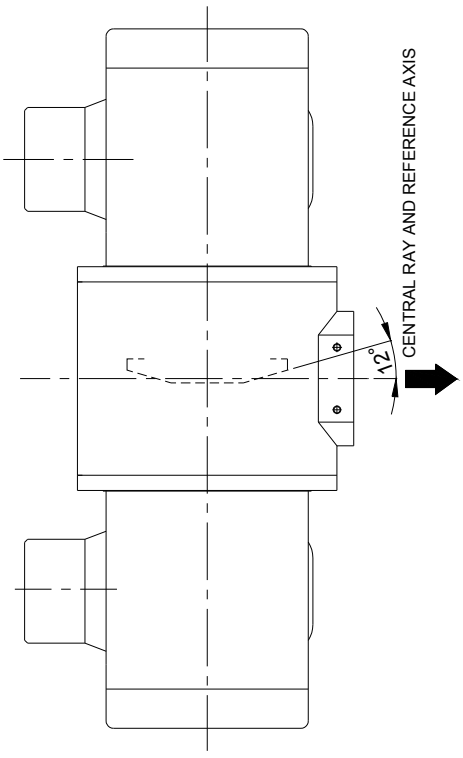

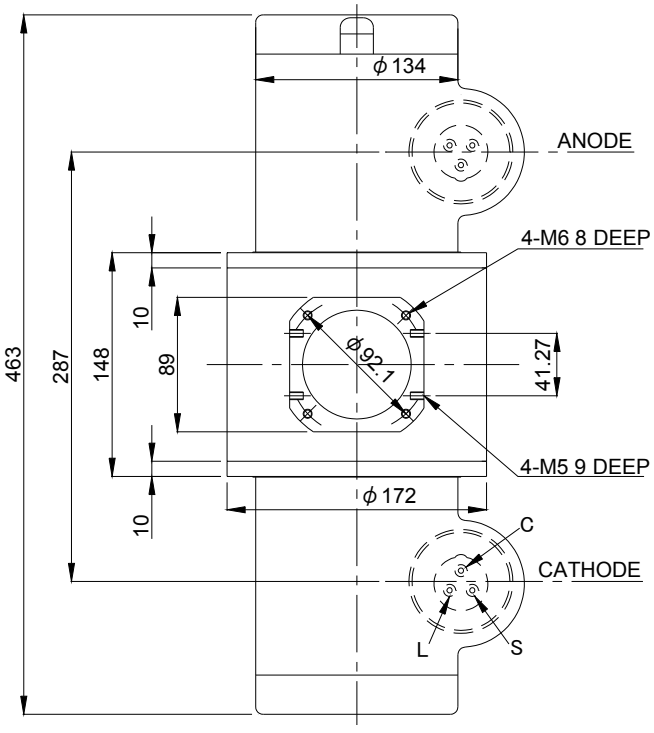

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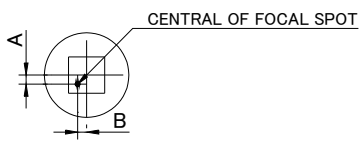

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ANODE & CATHODE TERMINAL
: IEC60526 TYPE

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