


ROTANODE
E7242X
E7242FX  **0197**
E7242GX

Rotating Anode X-Ray Tube Housing Assembly

- ◆ Rotating anode X-ray tube housing assembly for the purpose of general diagnostic X-ray procedures.
- ◆ Specially processed Rhenium-tungsten faced molybdenum target of 74 mm diameter.
- ◆ These tubes have foci 1.5 mm and 0.6 mm, and are available for a maximum tube voltage 125 kV with Three-phase generator.
- ◆ Accommodated with IEC 60526 type high-voltage cable receptacles.



General Data

IEC Classification **Class I Type B**

Electrical:

Circuit (Center-grounded)	Three-phase full-wave rectified
Nominal Tube Voltage:	
Radiographic	40 ~ 125 kV Max.
Nominal Focal Spot Value:	
Large Focus	1.5 mm
Small Focus	0.6 mm
Nominal Anode Input Power (at 0.1s):	
	60 Hz
Large Focus	50 kW
Small Focus	18 kW

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 For further particulars apply to TETD.

Motor Ratings:

Duty		Starting		Running
Power source	(Hz)	50/60		50/60
Input power	(W)	1050	270	43
Voltage ¹⁾	(V)	200	100	40
Current	(A)	6.0	3.0	1.2
Min. Speed up ²⁾	(s)	0.8	1.5	-
Capacitor	(µF)	24	24	24

Note: 1) The every applied voltage must be never exceeded 110% of the above specification.

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

Anode Speed:

50 Hz 2700 min⁻¹ Min.
 60 Hz 3200 min⁻¹ Min.

Stator impedance:

Common-Main Winding 27.5 Ω
 Common-Auxiliary Winding..... 58.0 Ω
 Resistance between Housing and Low Voltage Terminals 2 MΩ Min.
 Normal operating range of the housing temperature 10 ~ 75 °C

Mechanical:

Dimensions: See dimensional outline
 Overall Length 479 mm
 Maximum Diameter 152.4 mm
 Target:
 Angle 14 degrees
 Construction Rhenium-Tungsten faced molybdenum
 Permanent Filtration 0.9 mm Al / 75 kV IEC 60522 / 2003
 Radiation Protection (To meet the requirements of IEC 60601-1-3):
 Leakage Technique Factor 125 kV 4 mA
 X-ray Coverage 354 × 354 mm at SID 750 mm
 Weight (Approx.) 16 kg
 High Tension Terminals To meet the requirements of IEC 60526
 Cooling Method Natural or forced air
 Tube Housing Model Number:
 E7242X XH-121
 E7242FX XH-126
 E7242GX XH-150

Absolute Maximum and Minimum Ratings

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

Maximum Tube Voltage:

Radiographic 125 kV

Maximum Voltage to Ground 65 kV

Minimum Tube Voltage 40 kV

Maximum Tube Current:

Large Focus 800 mA

Small Focus 290 mA

Maximum Filament Current:

Large Focus 5.3 A

Small Focus 5.3 A

Filament Voltage:

Large Focus (At max. filament current 5.3 A) 10.6 ~ 14.4 V

Small Focus (At max. filament current 5.3 A) 5.1 ~ 6.9 V

Filament Frequency Limits 0 ~ 25 kHz

Average Input Power 60 W (85 HU/s)

(Repeated radiographic exposure)

Thermal Characteristics:

Anode Heat Storage Capacity 142 kJ (200 kHU)

Maximum Anode Heat Dissipation Rate 616 W (868 HU/s)

Housing Heat Storage Capacity 900 kJ (1250 kHU)

Maximum Housing Heat Dissipation Rate:

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

Warning

Warning to Interface with X-ray Generator

1. Housing Rupture

Never input over-rated power to x-ray tube assembly.

If the input power is extremely higher than specification, it may cause the over temperature of anode, insert tube glass shatter and ultimately the following serious problems due to generating over-pressure by oil vaporization inside housing assembly.

In such a critical condition, the safety thermal switch can not protect x-ray tube even if it works.

- * Housing sealing parts (cathode side) rupture
- * Human injury including burns due to hot oil escape
- * Fire accident due to flaming anode target

We strongly request that the x-ray generator should have a protective function which manages input power to x-ray tube assembly.

Cautions

Caution to Interface with X-ray Generator

1. Over Rating

X-ray tube assembly can be broken with applying just one over rated shot.
Please read the technical data sheets carefully and follow the instructions.

2. Permanent Filtration

The total filtration and the distance between x-ray focal spot and human body are regulated legally.
They should be complied with the regulation.

3. Safety Thermal Switch

X-ray tube assembly has safety thermal switch to prohibit further input power when the tube housing reaches to the temperature of switch-open.

The switch should be hooked up with the x-ray generator which control output power to x-ray tube assembly.

Even if the switch works, never turn the system power off and the cooling unit should be activated.

4. Unexpected Malfunction

X-ray tube assembly may have the risk to be unexpectedly malfunctioning due to life termination or failure. If the serious problems caused by the above risk is expected, we recommend to have a contingency plan to avoid such a case.

5. New Application

If you use the product with new application not to be mentioned in this specification or with different type of x-ray generator, please contact to us for confirming its availability.

Caution for Installation, Adjustment and Maintenance

1. Qualified Persons

Only qualified persons who have technical training and professional knowledge can handle x-ray tube assembly.

2. Fragile Glass

X-ray tube is assembled with glass, therefore, it can be broken with the mechanical vibration or pulsed shock over 19.6m/s^2 (2G).

Careful handling is required to treat or transport.

3. Ground Terminal

X-ray tube assembly has ground terminal. Ground cable should be connected.

4. High Voltage

All x-ray tubes operate at voltages high enough to kill through electrical shock. Never touch the high voltage delivered plugs or terminals.

When direct access to such parts is required, the primary circuit should be disabled and high voltage capacitors/cables discharged.

5. High Voltage Plug

High voltage plug should be cleaned up and free from any physical damages. Silicon compound application is required for high voltage stability.

6. Operation Atmosphere

X-ray tube assembly is not allowed to use in the atmosphere of flammable or corrosive gas.

7. Protective Cover

X-ray tube assembly is not allowed to use without the protective cover attached.

8. Handling

Appropriate jig or tools are required for tube installation to avoid physical damages.

9. Returning Tube

X-ray tube assembly should be repackaged with the original material when it is returned back for quality examination in our factory.

Be careful to put the tube upside cathode. If the packaging is not proper, the tube may not be correctly examined.

Caution in Operation

1. X-Ray Radiation

X-ray tube assembly should have the beam limiting equipment mounted on the x-ray port to protect unnecessary radiation.

2. Dielectric Oil

X-ray tube assembly has dielectric oil contained for high voltage stability. As it is poisonous for human health, if it is exposed to the non-restricted area, it should be disposed as following to the local regulation.

3. Operation Atmosphere

X-ray tube assembly is not allowed to use in the atmosphere of flammable or corrosive gas.

4. Lead Disposition

X-ray tube housing is lined with lead to protect unnecessary radiation. As the lead powder or vapor is harmful for human health, it should be disposed as following to the local regulation or returned back to us with your cost of transportation. We dispose it in our facility with free of charge.

5. X-ray tube housing temperature

Do not touch on X-ray tube housing surface just after operation due to high temperature.
Stay X-ray tube to be cooled.

6. Any Malfunction

Please contact to your system service person immediately, if any malfunction is noticed.

Caution Label

- (a) This label is a caution label to notify the user of the following point.
"Housing end cap is used to protect the electric shock and x-ray leakage."

Attachment position: X-ray tube assembly housing end cap

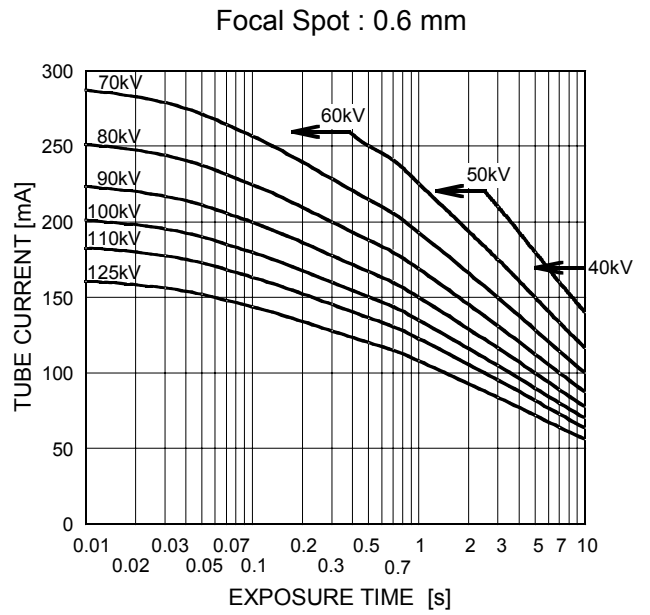
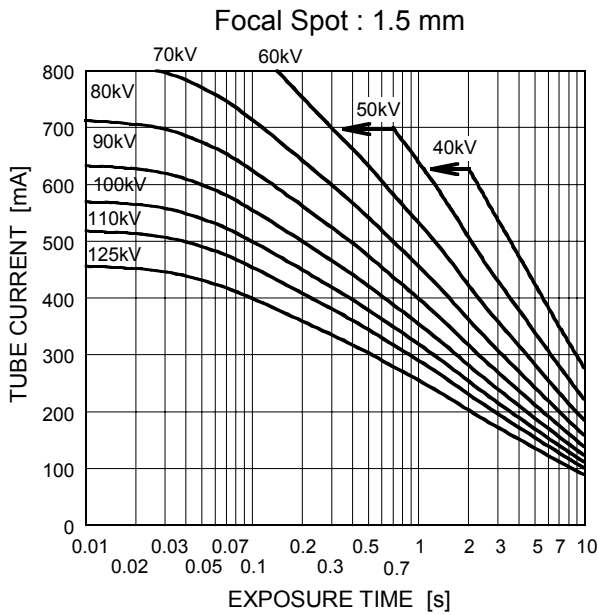


Maximum Rating Charts

(Absolute Maximum Rating Charts)

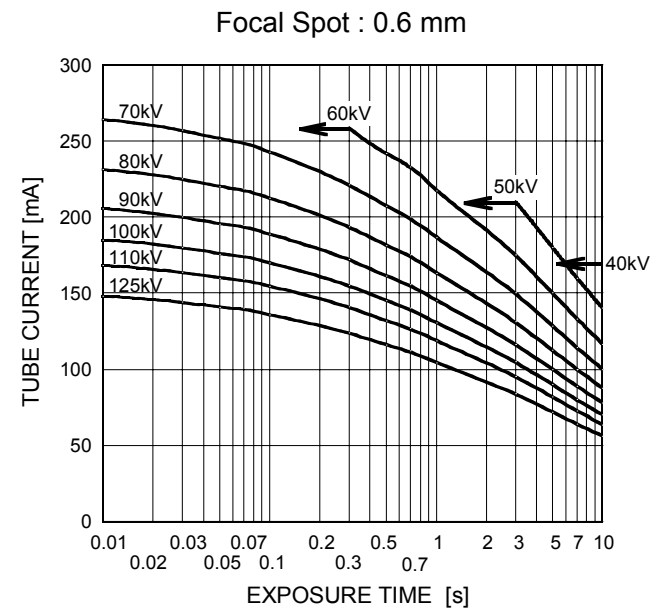
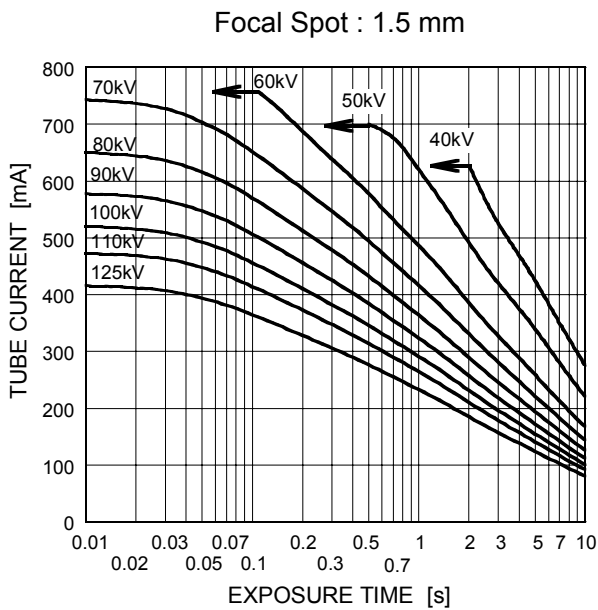
Conditions : Tube Voltage Three-Phase

Stator Power Frequency 60Hz



Conditions : Tube Voltage Three-Phase

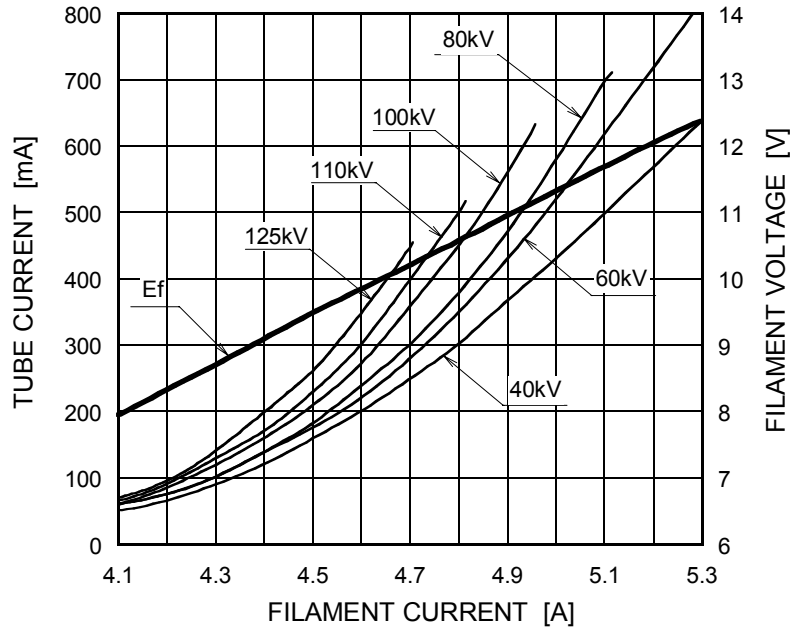
Stator Power Frequency 50Hz



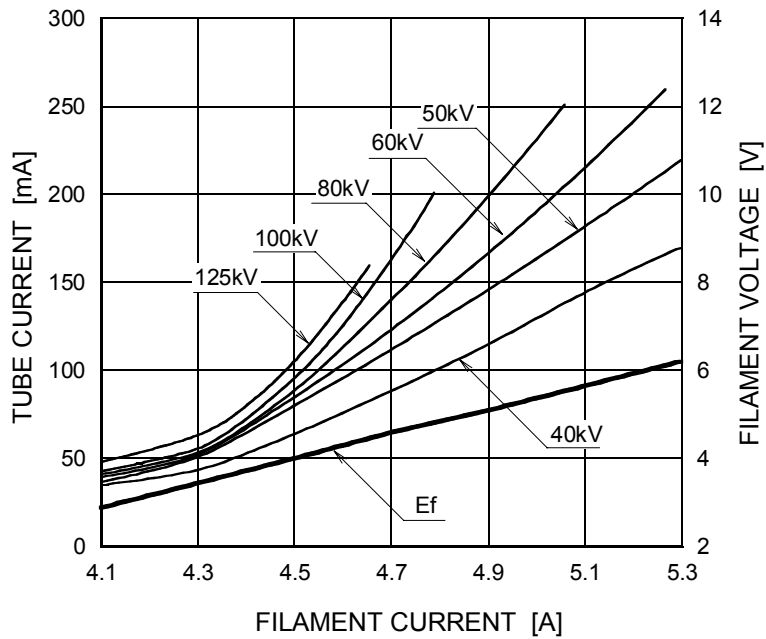
Emission & Filament Characteristics

Three-Phase

Focal Spot : 1.5 mm

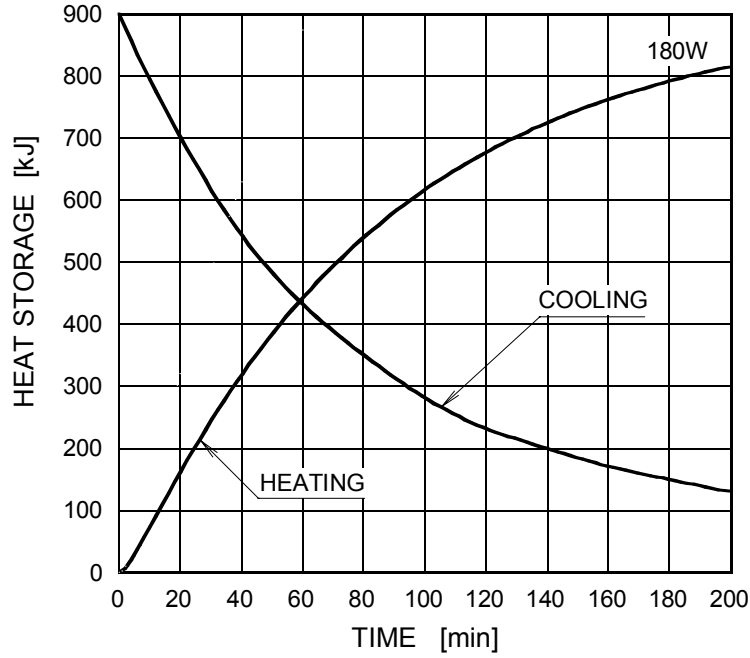


Focal Spot : 0.6 mm



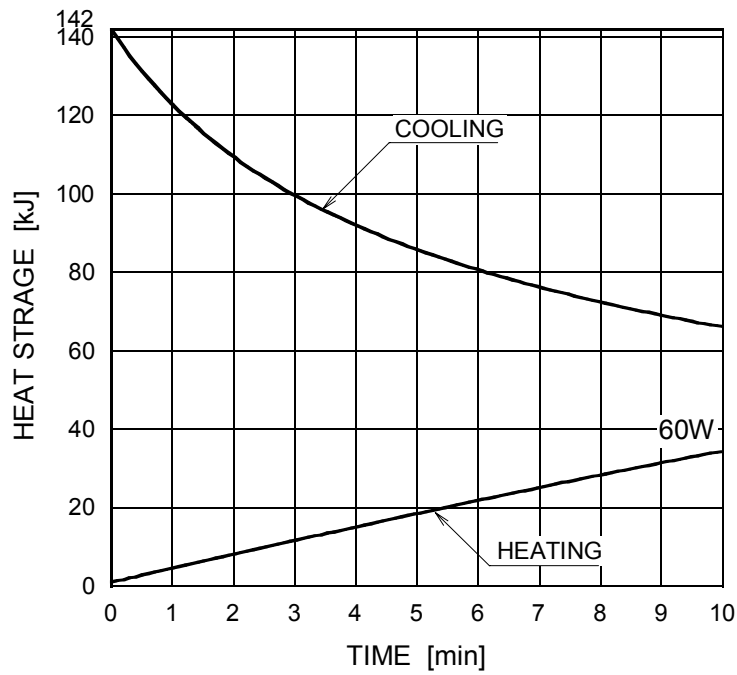
Thermal Characteristics

Housing Thermal Characteristics



Cooling Without Air Circulator.

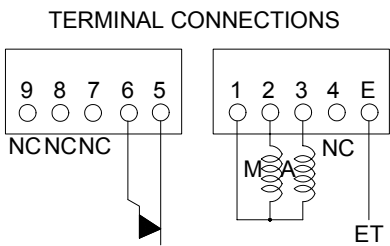
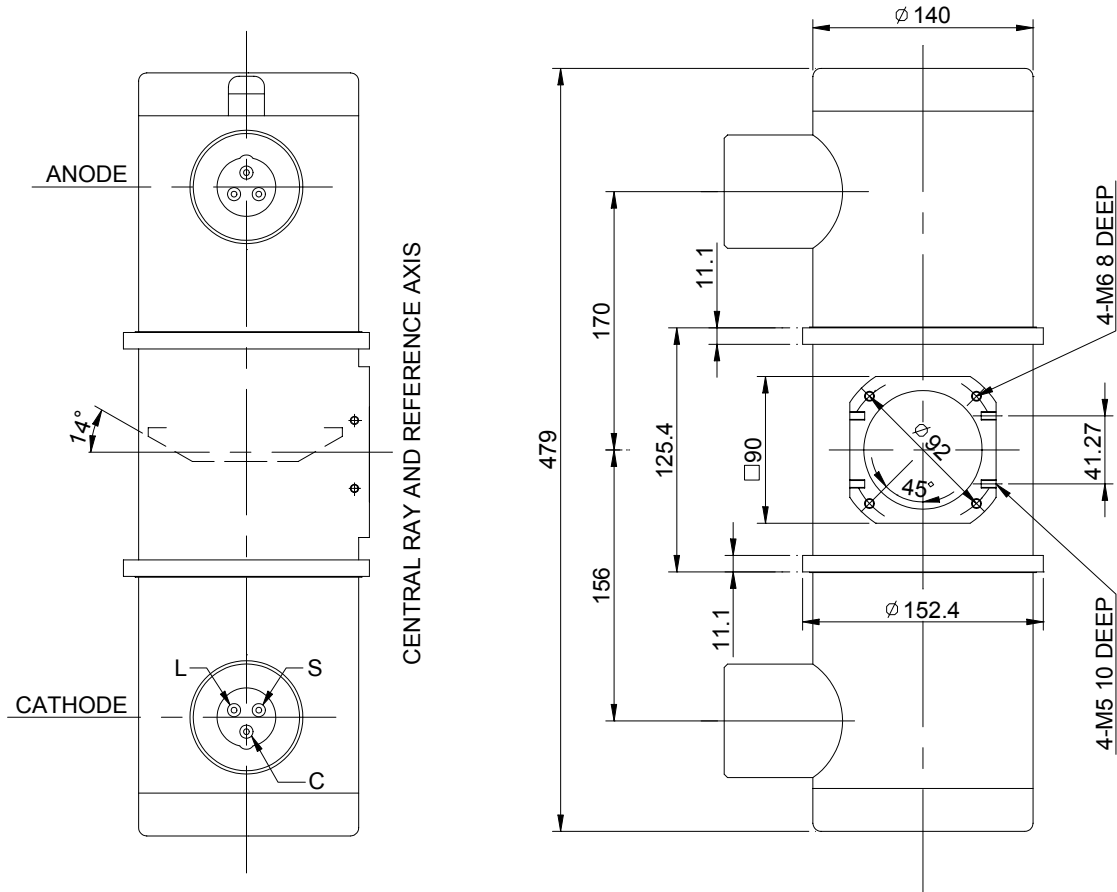
Anode Thermal Characteristics



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

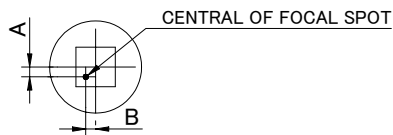
Dimensional Outline of E7242FX

Unit mm



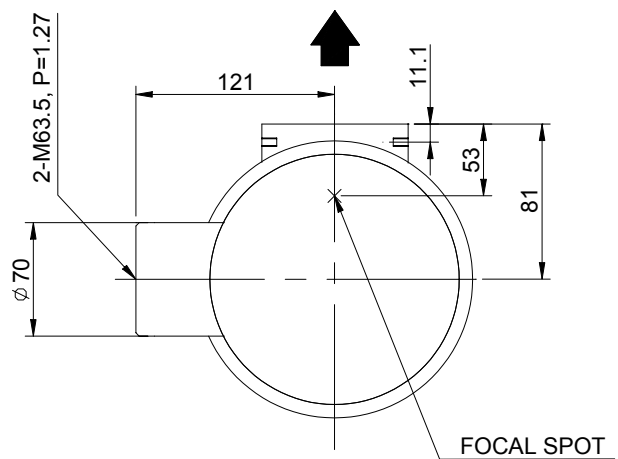
TEMPERATURE RELAY (NORMALLY CLOSED)

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



A: ±1.5mm, B: ±1.5mm

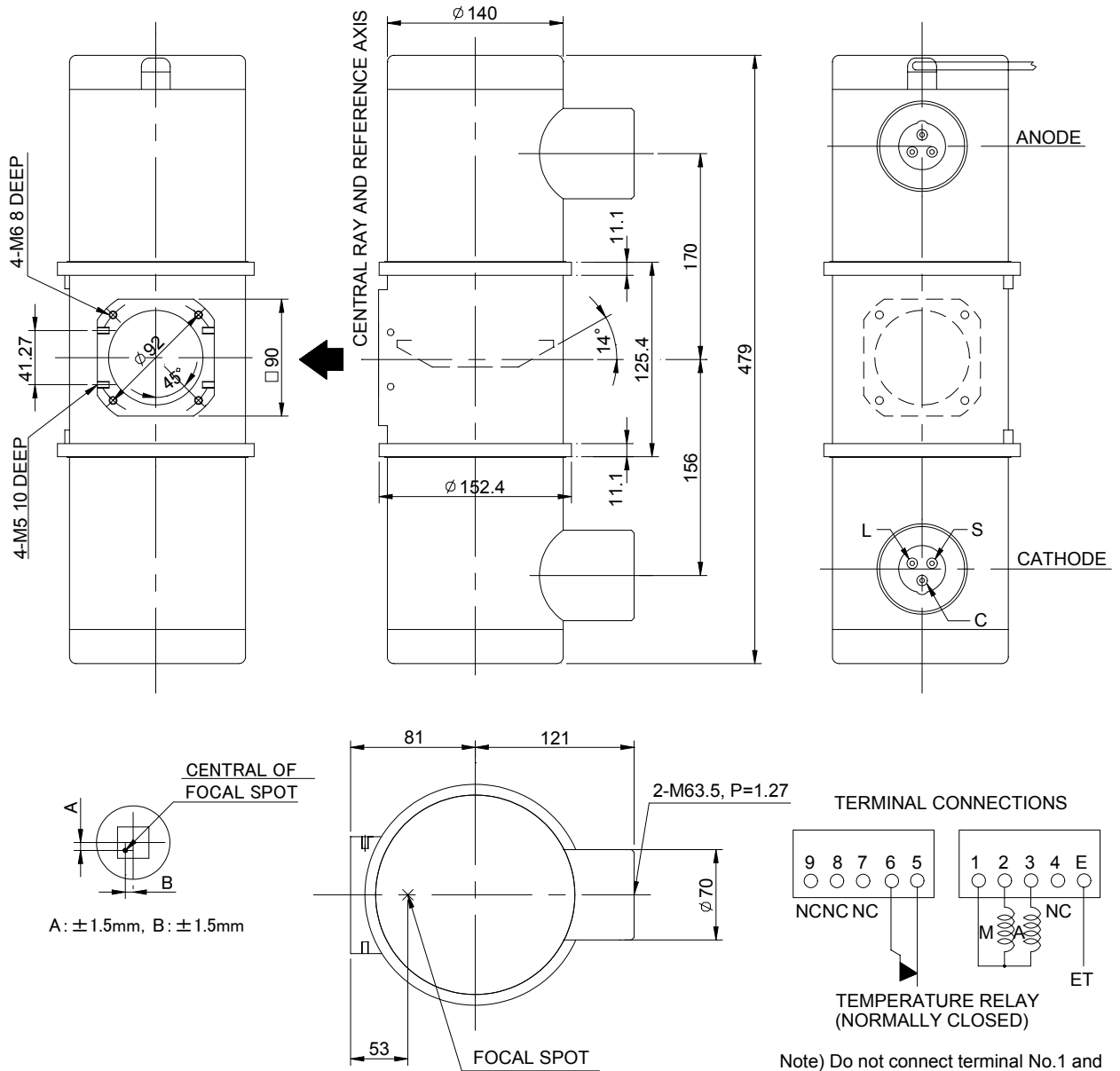
C : COMMON
 L : LARGE FOCUS
 S : SMALL FOCUS
 M : MAIN WINDING OF THE STATOR
 A : AUX. WINDING OF THE STATOR



NC: NON-CONNECTION
 ET: EARTH TERMINAL
 ▲: CENTRAL X-RAY
 ANODE & CATHODE TERMINAL : IEC 60526 TYPE

Dimensional Outline of E7242GX

Unit mm



C : COMMON
 L : LARGE FOCUS
 S : SMALL FOCUS
 M : MAIN WINDING OF THE STATOR
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NC : NON-CONNECTION
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 ANODE & CATHODE TERMINAL
 : IEC 60526 TYPE

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

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