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Product Information *PI*

**ROTANODE™**
**E7876X** CE 0197

# Rotating Anode X-ray Tube Assembly

- 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 is 74 mm diameter and has an improved coating to increase thermal emissivity.
- This tube has foci 1.2 and 0.6, and is available for a maximum tube voltage 150 kV.
- Accommodated with IEC60526 type high-voltage cable receptacles.

## General Data

**IEC Classification (IEC60601-1:2005) ..... Class Ⅰ ME EQUIPMET**

### Electrical:

Circuit:

High Voltage Generator ..... Constant Potential High-Voltage Generator

Grounding ..... Center-grounded

Nominal X-ray Tube Voltage (IEC60613:2010):

Radiographic ..... 150 kV

Fluoroscopic ..... 125 kV

Nominal Focal Spot Value (IEC60336:2005):

Large Focus ..... 1.2

Small Focus ..... 0.6

Nominal Anode Input Power (at 0.1s):

| | 50 Hz | 60 Hz |
|---|---|---|
| Large Focus | 50 kW | 54 kW |
| Small Focus | 20 kW | 22 kW |

Nominal Radiographic Anode Input Power (IEC60613:2010):

| | 50 Hz | 60 Hz |
|---|---|---|
| Large Focus | 43 kW | 48 kW |
| Small Focus | 18 kW | 21 kW |

Motor Ratings:

Stator: XS-RA

| | | Starting | Running |
|---|---|---|---|
| Driven Frequency | [Hz] | 50/60 | 50/60 |
| Input Power | [W] | 1450 | 80 |
| Voltage [1) 3)] | [V] | 240 | 58 |
| Current [2)] | [A] | 6.5 | 1.5 |
| Min. Speed Up [4)] | [s] | 0.6 | - |
| Capacitor | [μF] | 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:
- 50 Hz ..... Minimum 2700 $min^{-1}$
- 60 Hz ..... Minimum 3200 $min^{-1}$

Stator Resistance:
- Common-Main Winding ..... 27.5 Ω
- Common-Auxiliary Winding ..... 58.0 Ω

Resistance between Housing and Low Voltage Terminals ..... Minimum 2 MΩ
Normal Operating Range of the Housing Temperature ..... 16 ~ 75 ℃
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 requirements of IEC60526 Corrigendum1:2010
Cooling Method ..... Natural or forced air
Housing (Including both end plates):
- Model Number ..... XH-121

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

Maximum X-ray Tube Voltage (IEC60613:2010):
- 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 (IEC60613:2010) .....See rating charts
- Large Focus ..... 700 mA
- Small Focus ..... 300 mA

Maximum Filament Current:
- Large Focus ..... 5.4 A
- Small Focus ..... 5.2 A

Filament Voltage:
- Large Focus (At maximum filament current 5.4 A) ..... 11.9 ~ 16.1 V
- Small Focus (At maximum filament current 5.2 A) ..... 6.8 ~ 9.2 V

Filament Frequency Limits ..... 0 ~ 25 kHz
Continuous Anode Input Power (IEC60613:2010) ..... 142 W (200 HU/s)
(Repeated radiographic exposure)
Thermal Characteristics:
- Anode Heat Content ..... 163 kJ (230 kHU)
- Maximum Anode Heat Dissipation ..... 750 W (1056 HU/s)
- X-ray Tube Assembly Heat Content ..... [1] 900 kJ (1250 kHU)
  [2] 975 kJ (1354 kHU)
- Nominal Continuous Input Power (IEC60613:2010):
  - Without Air-circulator ..... [1] 180 W (250 HU/min)
    [2] 196 W (272 HU/sec)

Note 1) Based on TETD's nominal temperature range (25℃)
Note 2) Based on IEC specified maximum temperature range (20℃)

## Environmental Limits

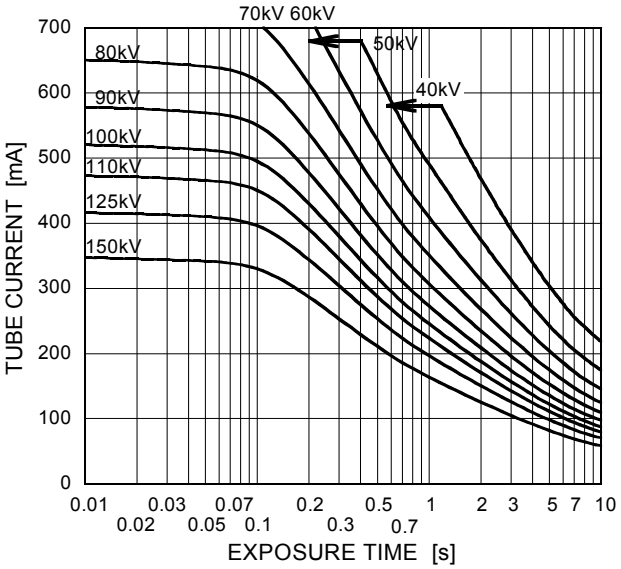
Operating Limits:
- Temperature ..... 10 ~ 40 ℃
- Humidity ..... 30 ~ 85 %
  (No condensation)
- Atmospheric Pressure ..... 70 ~ 106 kPa

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

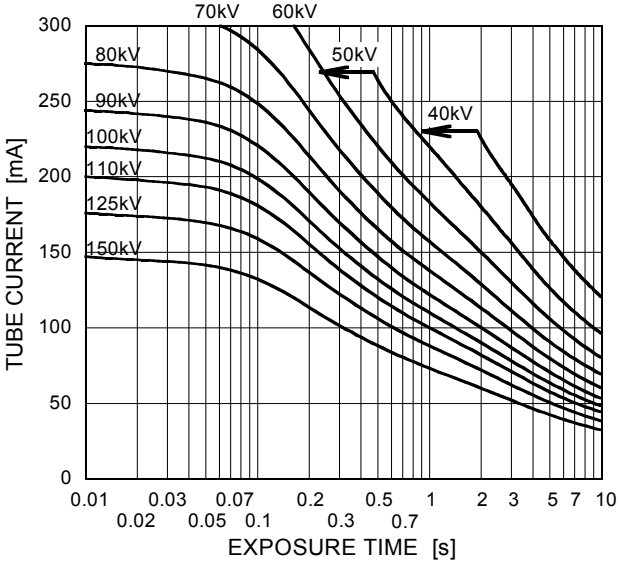
# Maximum Rating Charts
## (Absolute Maximum Rating Charts)

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

Nominal Focal Spot :Value: 1.2 ■



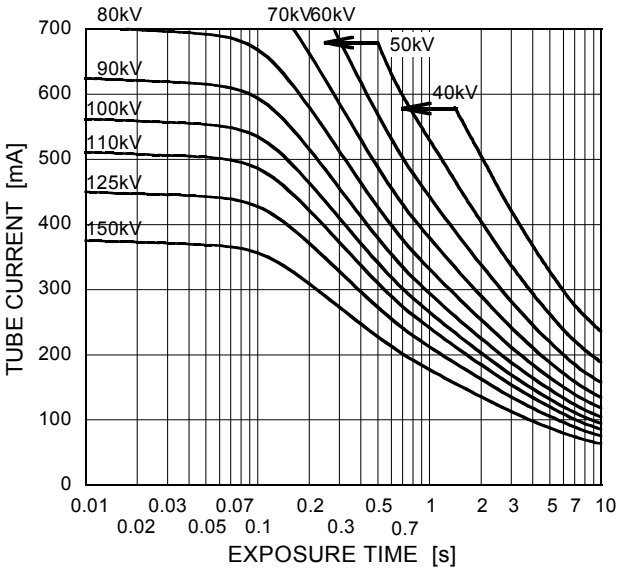

Nominal Focal Spot :Value: 0.6 ▣



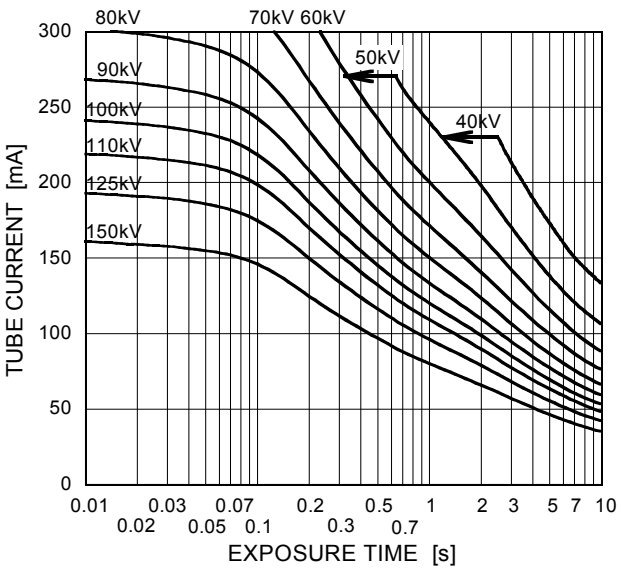

Refer to IEC60613:2010

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 ▣

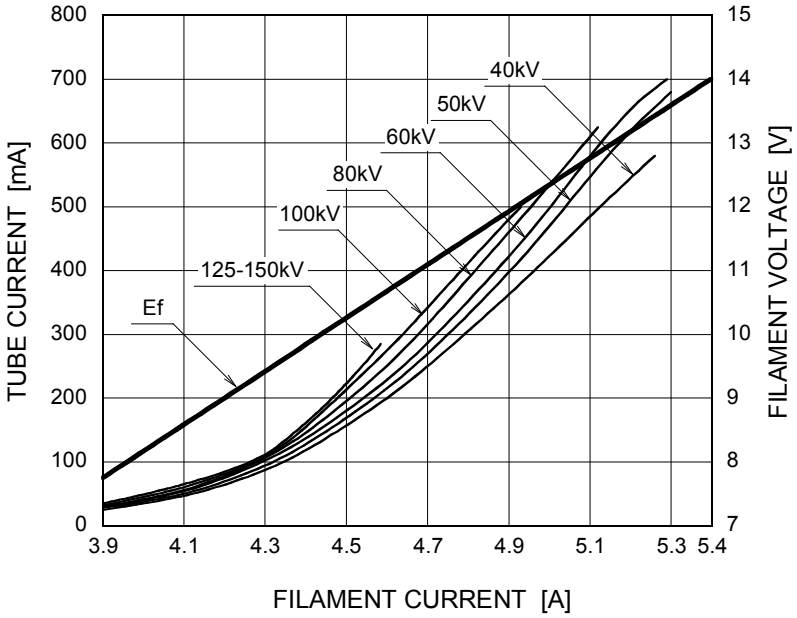



Refer to IEC60613:2010

# Emission & Filament Characteristics

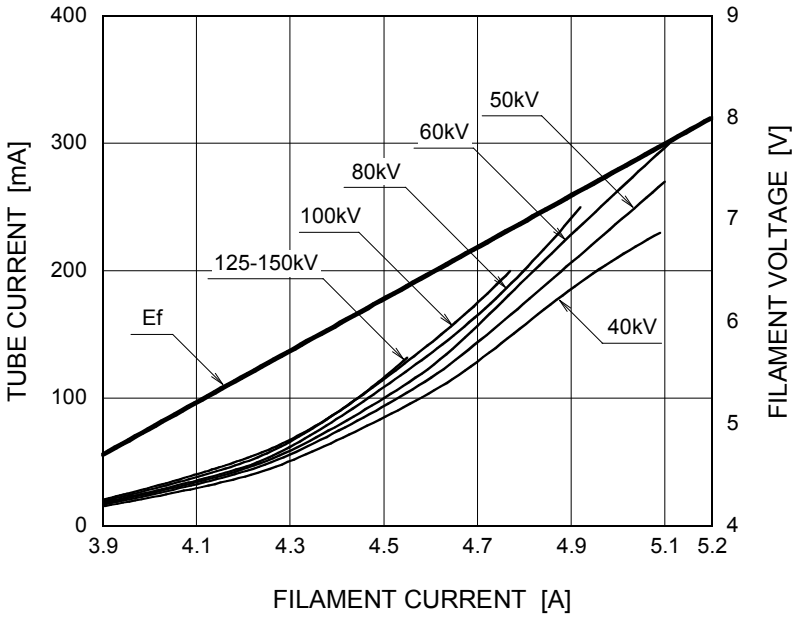
Constant Potential High-Voltage Generator

Nominal Focal Spot Value: 1.2 ■




Note1) For Reference Only
Note2) Refer to IEC60613:2010

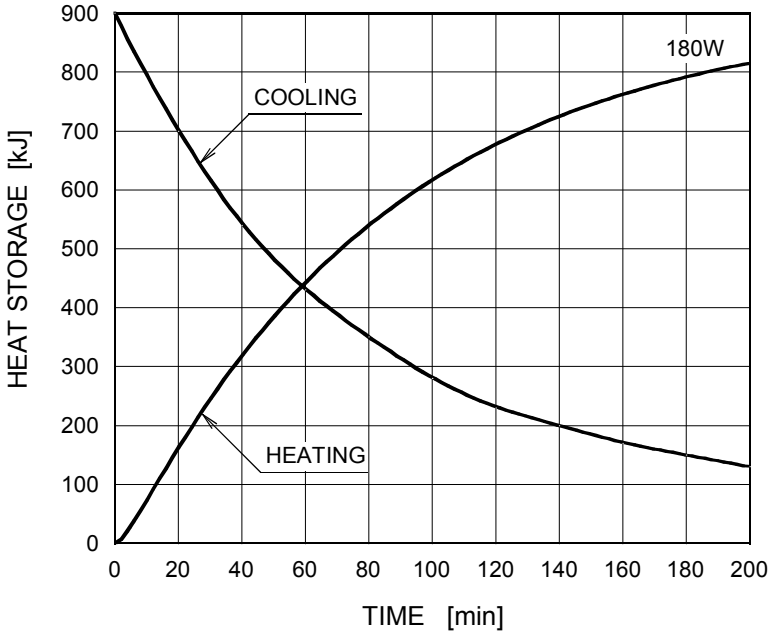
Nominal Focal Spot Value: 0.6 ▣



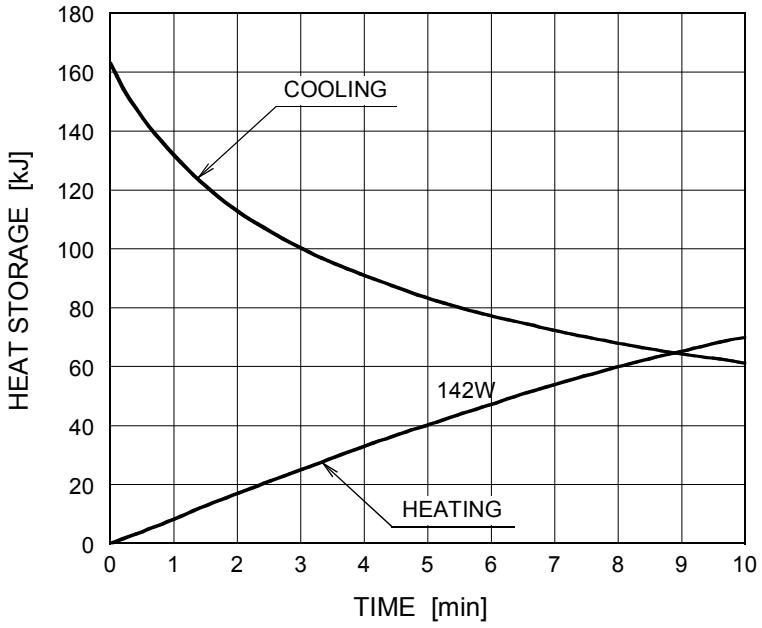

Note1) For Reference Only
Note2) Refer to IEC60613:2010

# Thermal Characteristics

X-ray Tube Assembly Heating / Cooling Curve



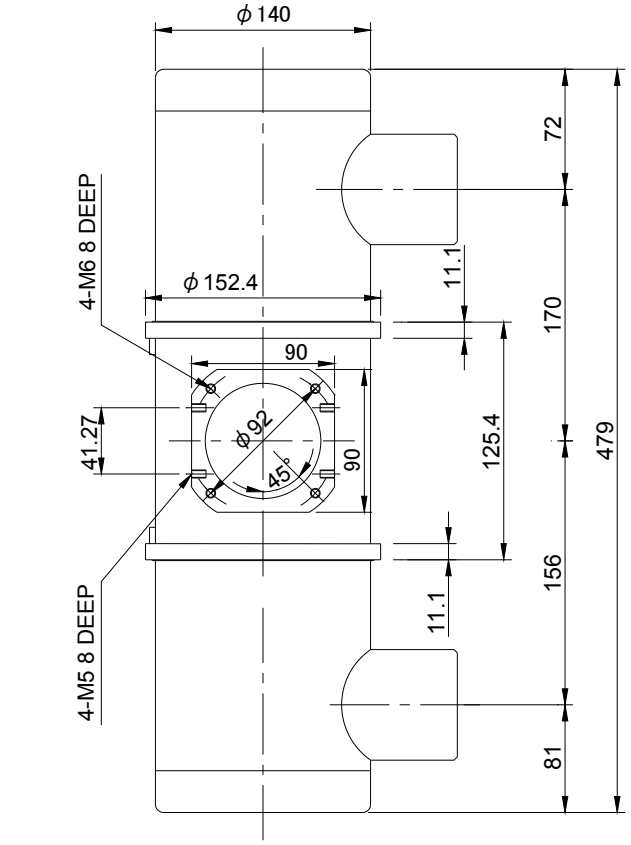

Anode Heating / Cooling Curve

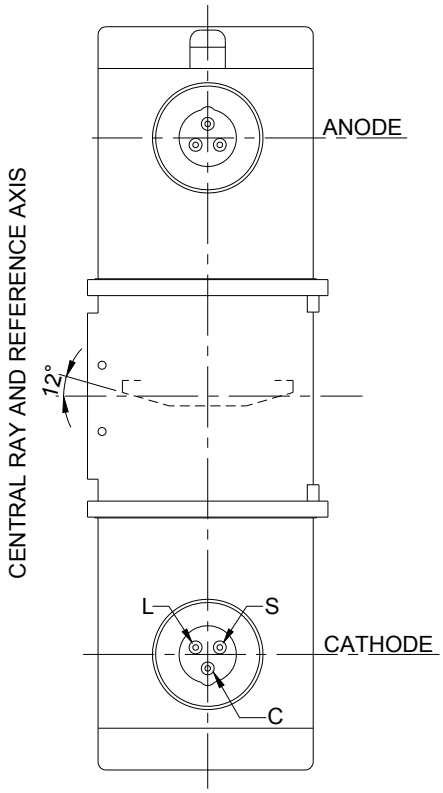


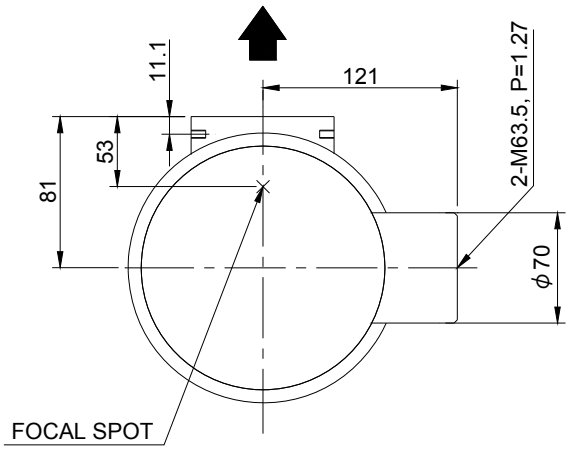

The heating curves are showing example of average Input power to anode in operation.

# Dimensional Outline

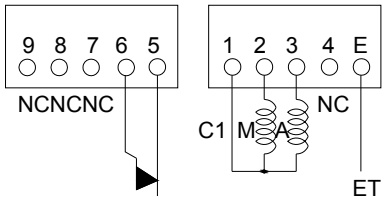
Unit: mm



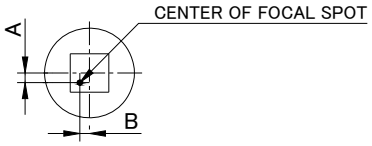




TERMINAL CONNECTIONS




TEMPERATURE RELAY
(NORMALLY CLOSED)

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




−1.5mm≦A≦1.5mm
−1.5mm≦B≦1.5mm

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

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

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