

RADII™
H2100X
H2100Y
H2100Z

Rotating Anode X-ray Tube Assembly

- ◆ H2100 tube assembly has a double focus designed for use with high-speed anode rotation for high energy radiographic and cine-fluoroscopic operations.
- ◆ The integrated high quality tube with glass design has two super imposed focal spots and a reinforced 100 mm anode. The high anode heat storage capacity ensures a wide range of applications for standard diagnostic procedures with conventional radiographic and fluoroscopy systems.
- ◆ A special designed anode enables an elevated heat dissipation rate which leads to a higher patient through-put and a longer product life.
- ◆ A constant high dose yield during the entire tube life is ensured by the high density rhenium-tungsten compound target. Ease of integration into system products is facilitated by extensive technical support.



General Data

Safety Classification:

FDA	I
IEC60601-1:2005.....	IB
Directive 93/42/EEC	IIB

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):

Small Focus.....0.6
 Large Focus.....1.2

Nominal Anode Input Power (at 0.1s) :

	50 Hz	60 Hz	150Hz	180Hz
Small Focus.....	24 kW	26 kW	38kW	40kW
Large Focus.....	60 kW	64 kW	92kW	100kW

Stator Key Values:

One phase stator

	Starting		Running	
	150/180	50/60	150/180	50/60
Driven Frequency [Hz]	150/180	50/60	150/180	50/60
Input Power [W]	2300	1450	300	80
Voltage * [V]	320	220	120	60
Current [A]	7.0	7.5	2.0	1.5
Min. Speed Up [s]	1.0	0.6	-	-
Capacitor [μ f]	10/7	43/30	10/7	43/30
Min. Braking [s]	1.5 / 90 V (DC)			

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

Stator Resistance:

Main Winding (P) – Common (C) 18~22 Ω
 Shift Winding (S) – Common (C) 45~55 Ω

Rotating speed:

50Hz Min. 2700 rpm
 60Hz Min. 3200 rpm
 150Hz Min. 8100 rpm
 180Hz Min. 9700 rpm

Resistance between Housing and Low Voltage Terminals Min. 2 M Ω
 Normal Operating Range of the Housing Temperature 16 ~ 75 °C
 Mode of Operation Intermittent

Mechanical:

Dimensions.....	See dimensional outline
Overall Length.....	474 mm
Maximum Diameter	172 mm
Target:	
Anode Angle	12 degrees
Diameter	100 mm
Construction.....	Rhenium-Tungsten faced Molybdenum
Filtration:	
Permanent Filtration	0.9 mm Al / 75 kV IEC60522:1999
Available Additional Filter combination (3×0.5 mm)	Maximum 2.4 mm Al / 75 kV
Radiation Protection (In accordance with IEC60601-1-3:2008):	
Leakage Technique Factor	150 kV,2.9 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
Sense of anode rotation (Seen from cathode side)	Counter-clockwise

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

Small Focus.....500 mA

Large Focus.....1200 mA

Maximum Filament Current:

Small Focus.....5.4 A

Large Focus.....5.4 A

Filament Voltage:

Small Focus (At maximum filament current 5.4 A).....6~8.5 V

Large Focus (At maximum filament current 5.4 A).....16~18 V

Filament Frequency Limits.....0 ~ 25 kHz

Continuous Anode Input Power (IEC60613:2010).....300 W (423 HU/s)

(Fluoroscopic, repeated radiographic or mixed exposure)

Thermal Characteristics:

Anode Heat Content.....285 kJ (400 kHU)

Maximum Anode Heat Dissipation.....1250 W (1763 HU/s)

X-ray Tube Assembly Heat Content1111 kJ (1500 kHU)

Nominal Continuous Input Power (IEC60613:2010):

Without Air-circulator216W (17.3 kHU/min)

Environmental Limits

Operating Limits:

Temperature.....10 ~ 60 °C

Humidity30 ~ 75 %

(No condensation)

Atmospheric Pressure 70 ~ 106 kPa

Shipping and Storage Limits:

Temperature..... -20 ~ 70 °C

Humidity 20 ~ 90 %

(No condensation)

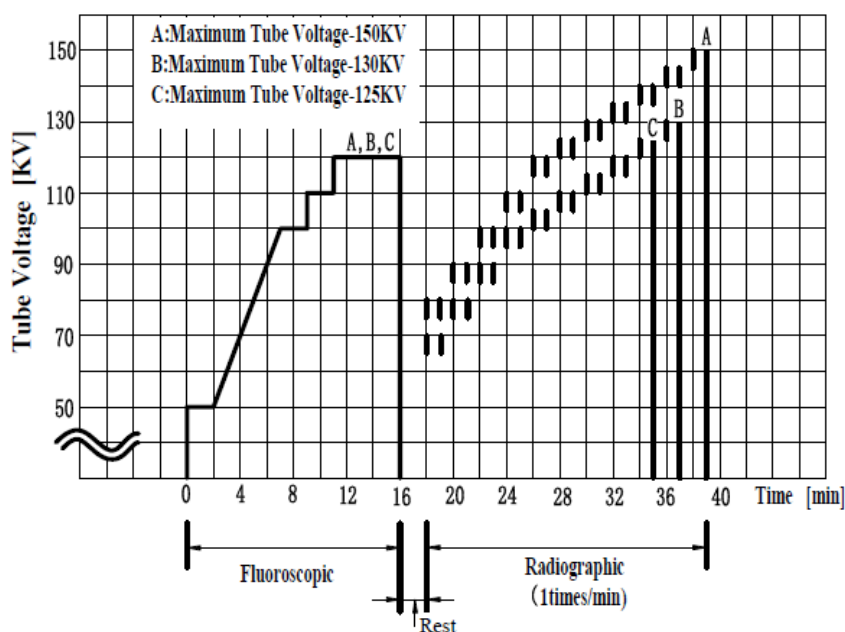
Atmospheric Pressure 50 ~ 106 kPa

Recommended Seasoning Procedure for Long Period Unused Tube

In order to keep long term to use x-ray tube device without any failure, please make seasoning procedure before usage, and enough cooling after application.

Seasoning procedure

1. Before the initial start-up of the x-ray tubes or after extended idle time (more than 2 weeks), we suggest to make seasoning procedure. And when tubes become unstable, recommend make seasoning procedure according to below seasoning procedure table.
2. Ensure that adequate radiation safety precautions are taken to protect any existing image intensifier against radiation. In order to protect x-ray leakage radiation, please close the collimator which is assembled into the port window of x-ray source.
3. When the tube current becomes unstable during high voltage ramp up, it is necessary to reduce the high voltage to be sure the tube current become stable.
4. Seasoning procedure must be done by professional and safety knowledge people.



When tube current cannot be set 50% mA, the tube current should be set not excess 50% and nearest value which close to 50% value.

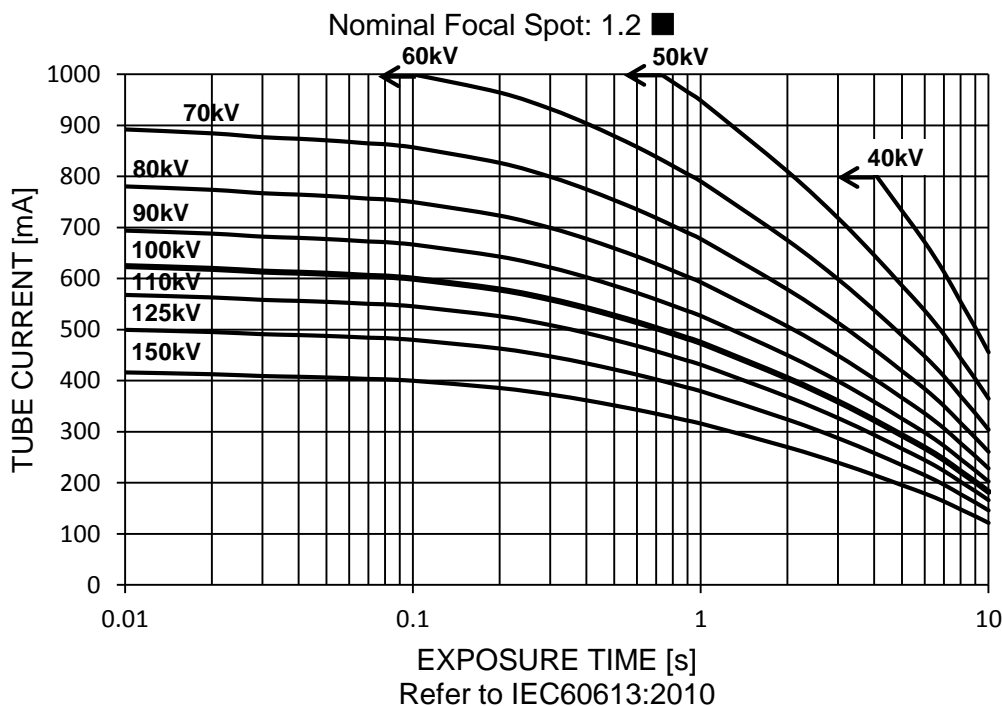
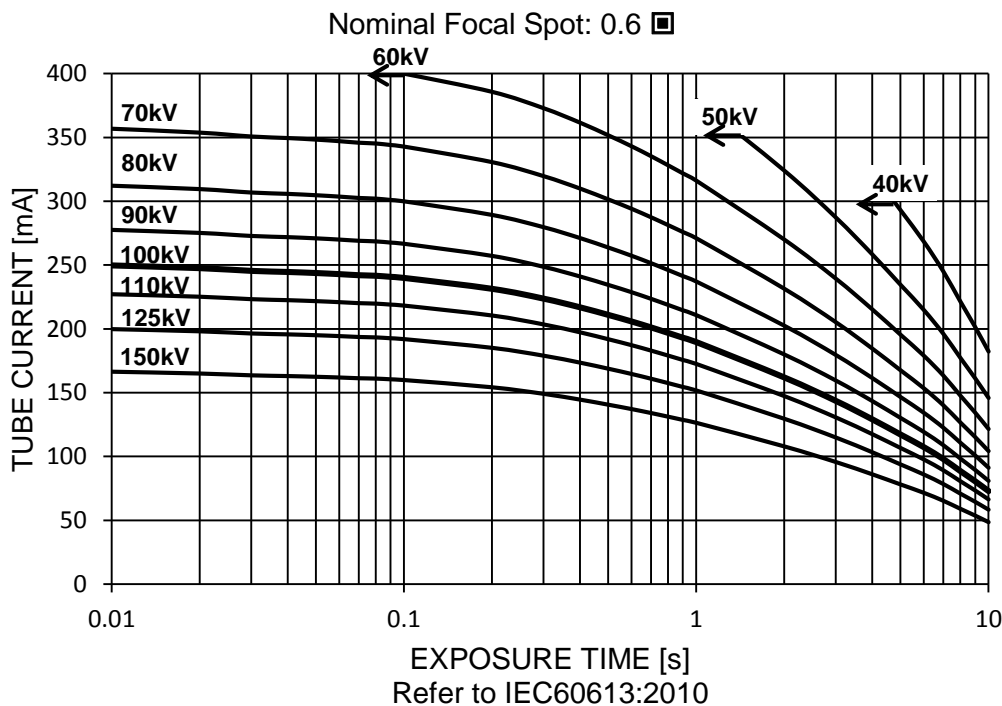
Maximum Rating Charts

(Absolute Maximum Rating Charts)

Conditions: Tube Voltage

Constant Potential High-Voltage Generator

Stator Power Frequency 50 Hz



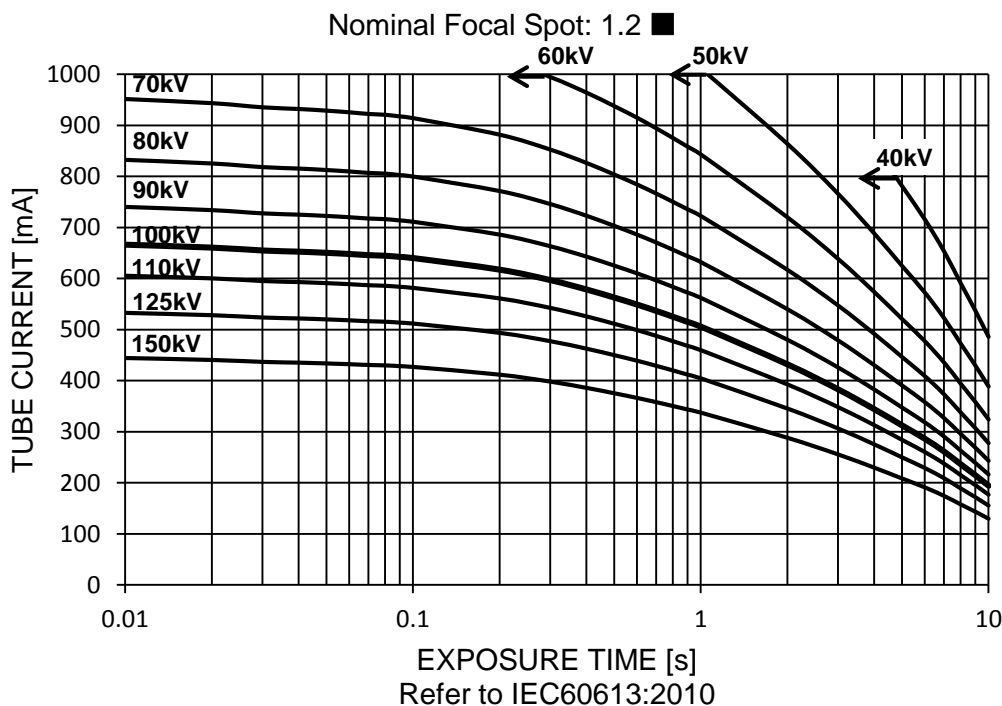
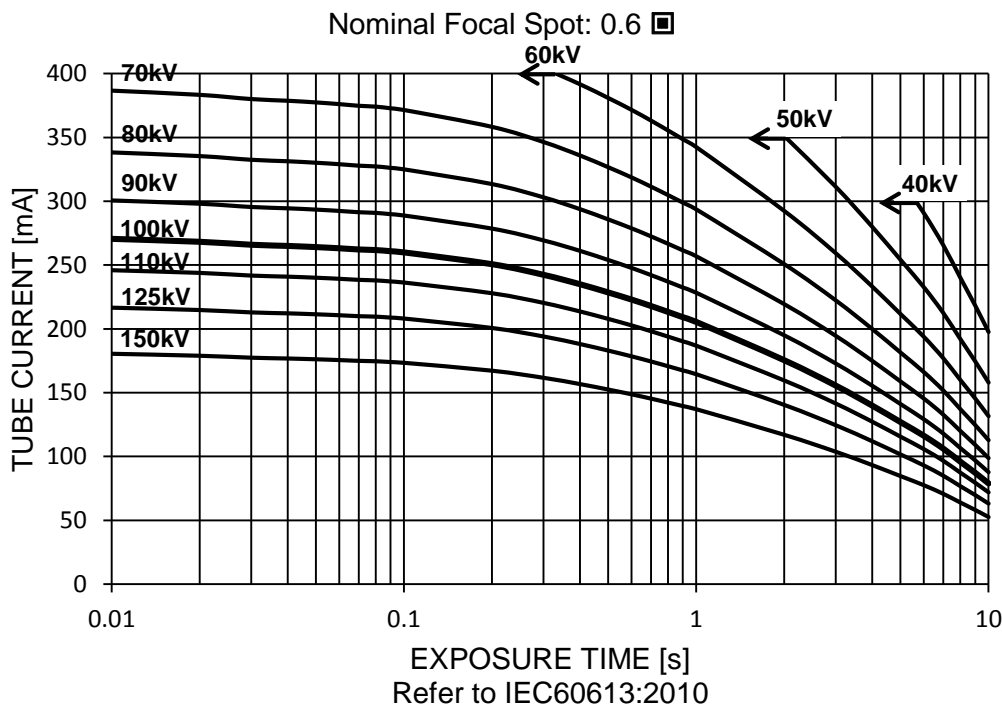
Maximum Rating Charts

(Absolute Maximum Rating Charts)

Conditions: Tube Voltage

Constant Potential High-Voltage Generator

Stator Power Frequency 60 Hz



Maximum Rating Charts

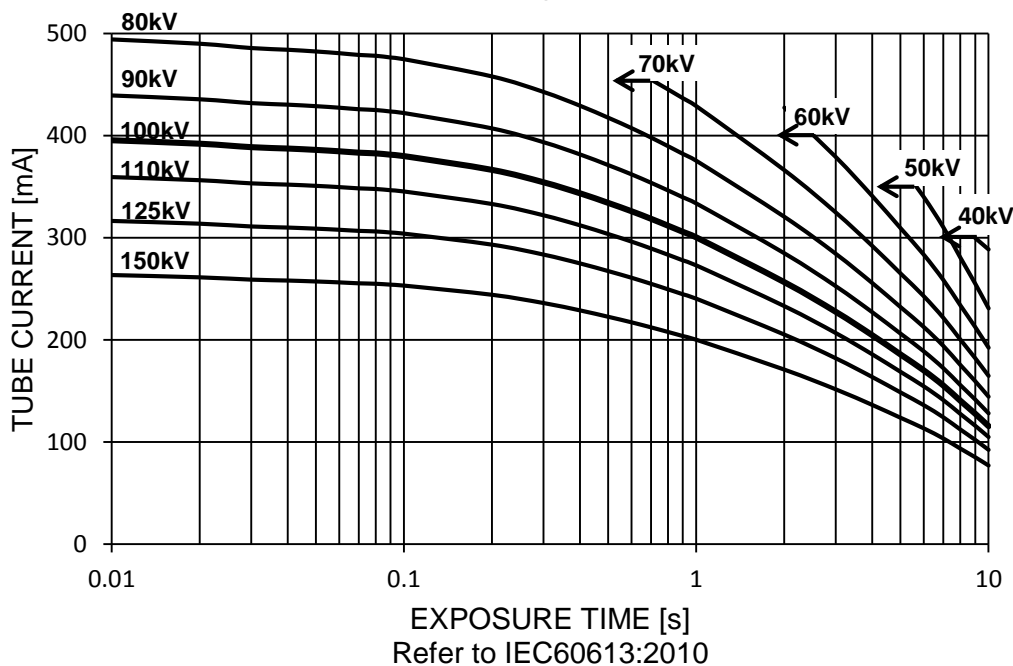
(Absolute Maximum Rating Charts)

Conditions: Tube Voltage

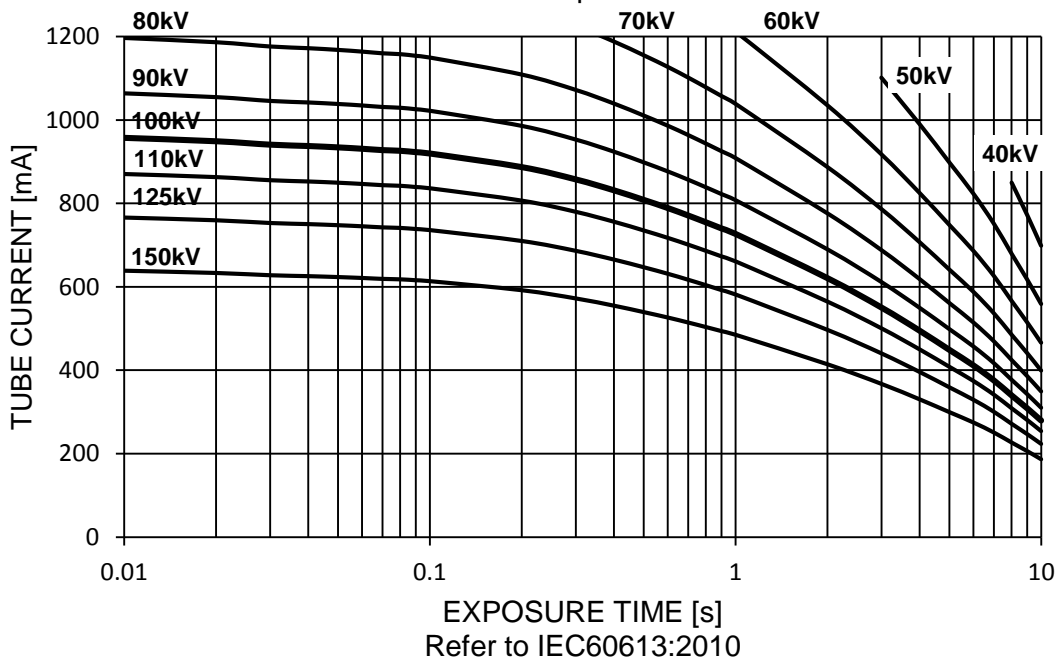
Constant Potential High-Voltage Generator

Stator Power Frequency 150 Hz

Nominal Focal Spot: 0.6 ■



Nominal Focal Spot: 1.2 ■



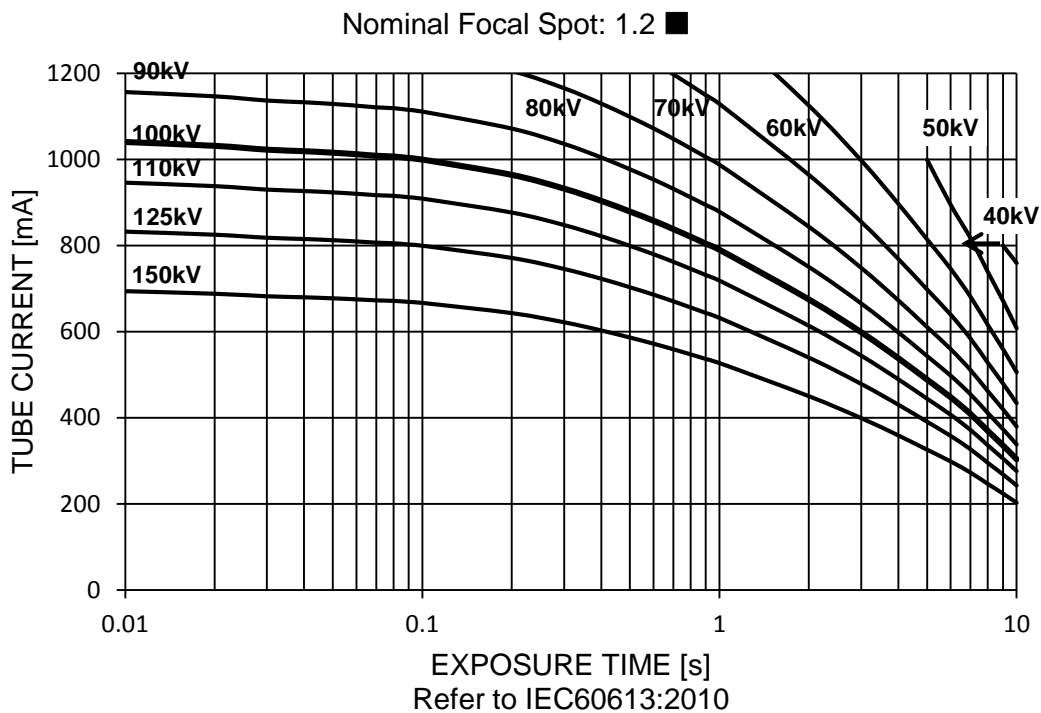
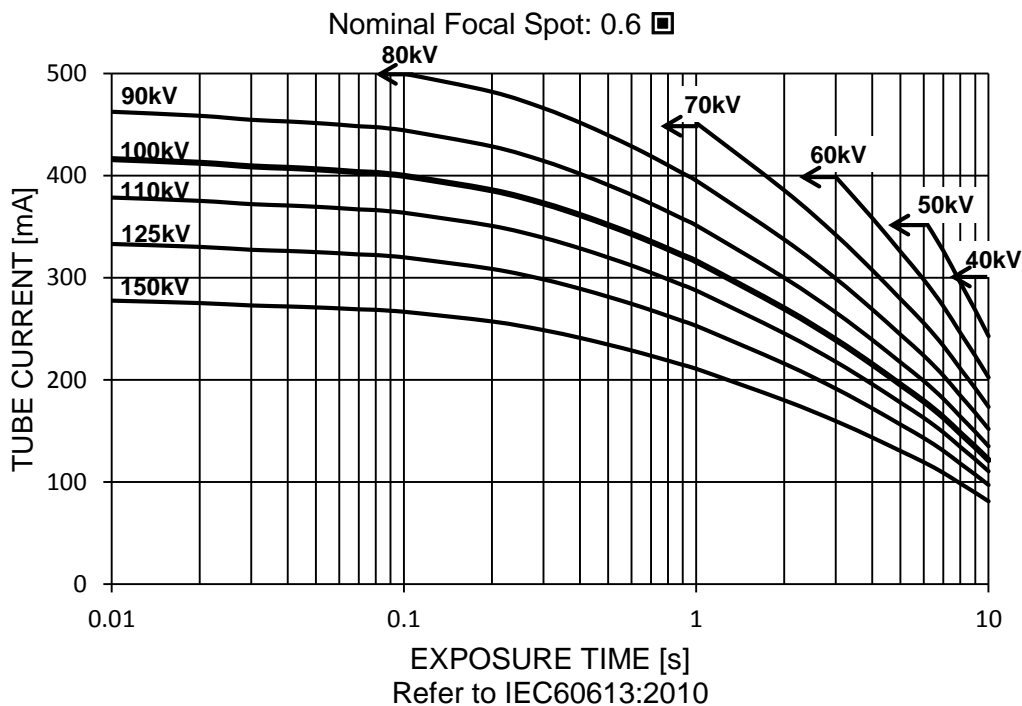
Maximum Rating Charts

(Absolute Maximum Rating Charts)

Conditions: Tube Voltage

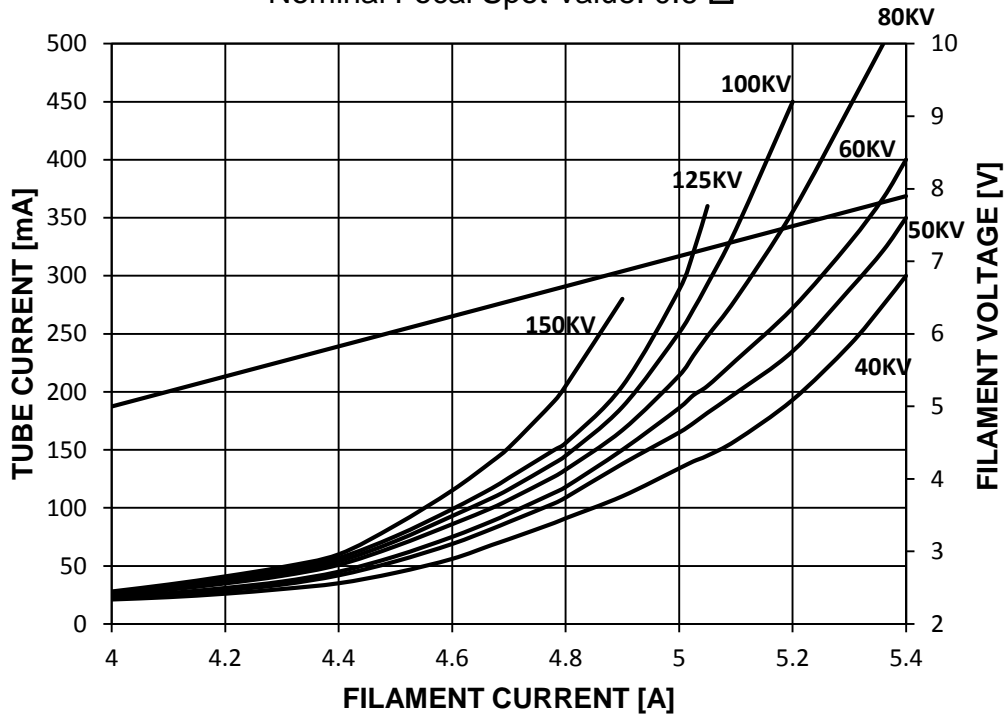
Constant Potential High-Voltage Generator

Stator Power Frequency 180 Hz

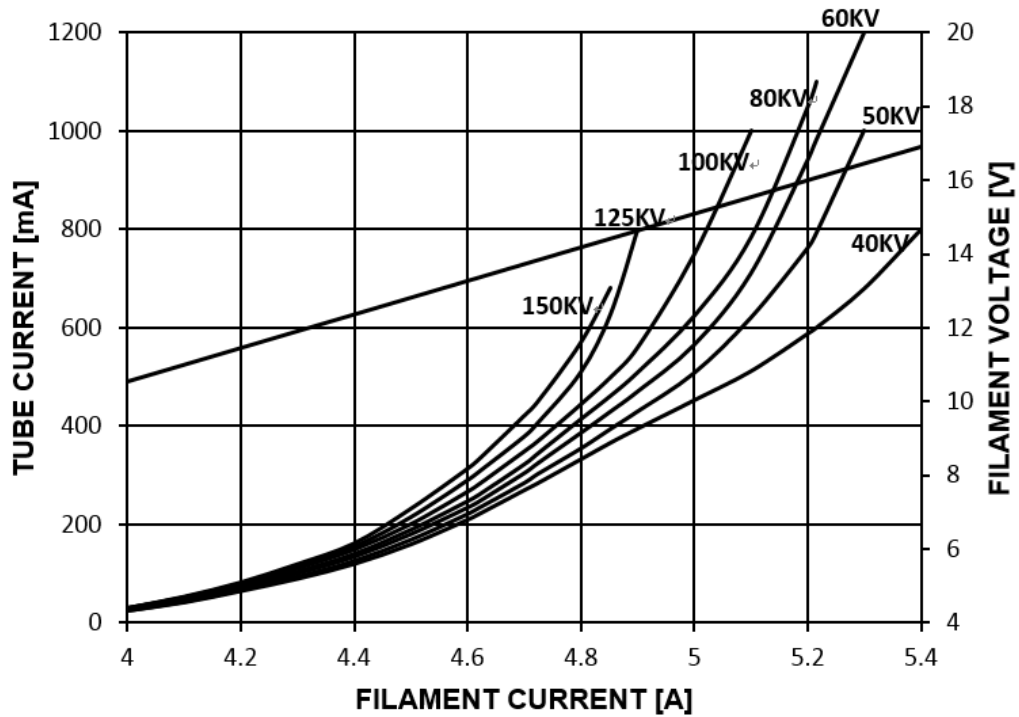


Emission Curves of the Cathode

Constant Potential High-Voltage Generator
Nominal Focal Spot Value: 0.6 \square

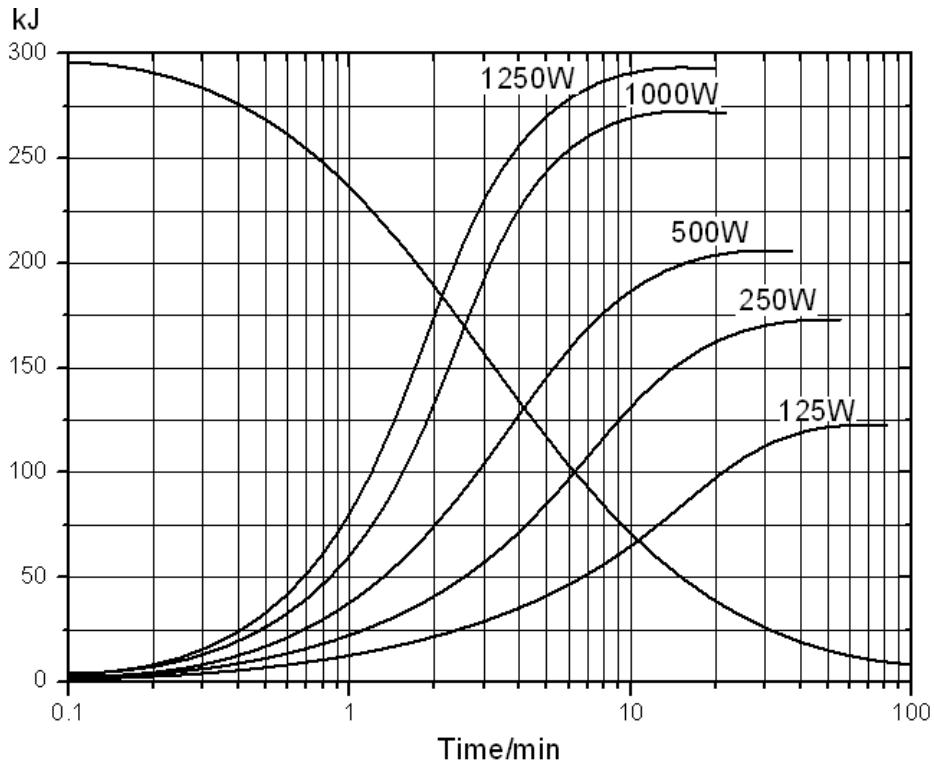


Constant Potential High-Voltage Generator
Nominal Focal Spot Value: 1.2 \square

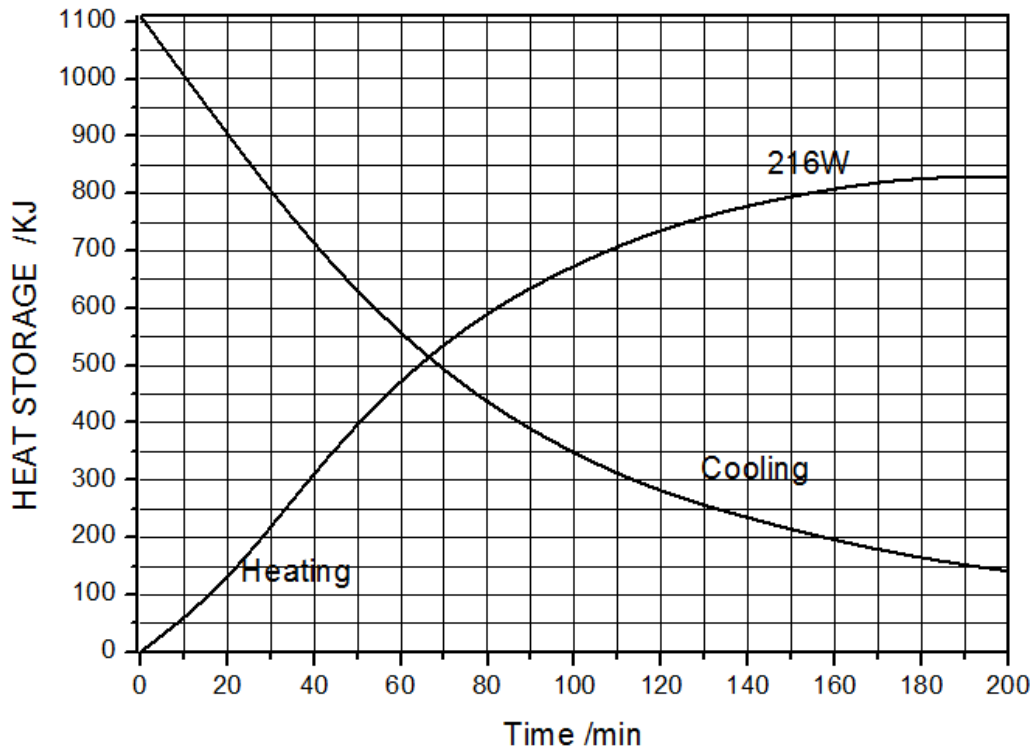


Thermal Characteristics

X-ray Tube Assembly Heating / Cooling Curve

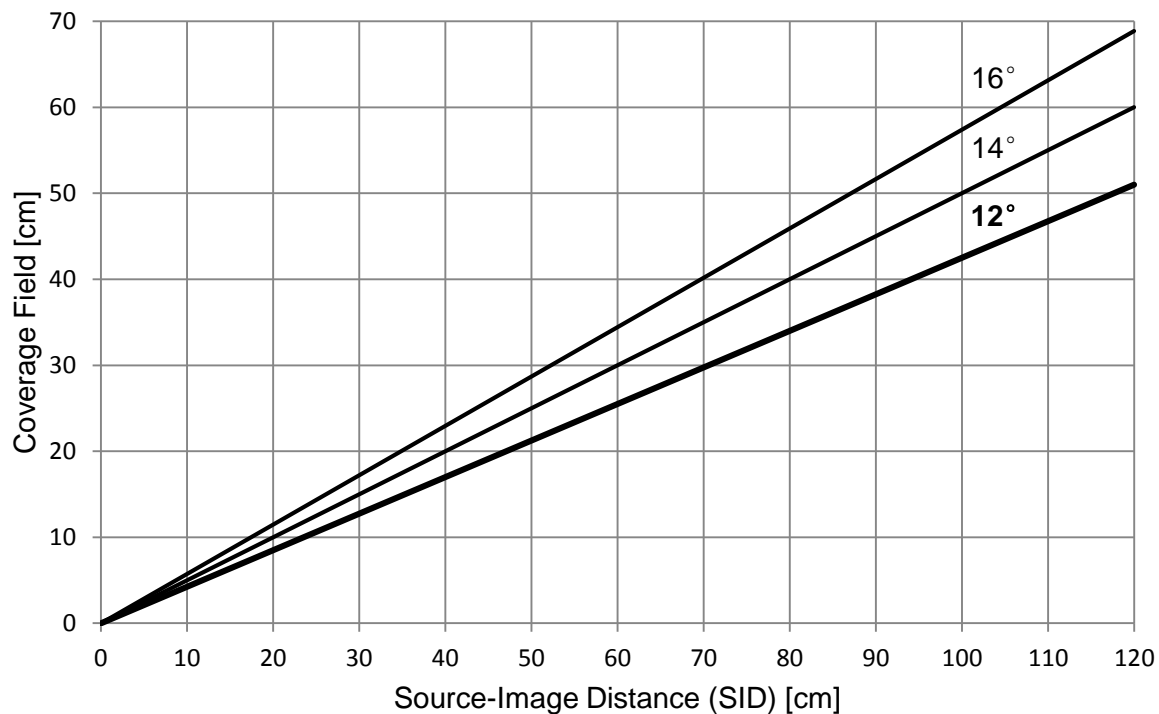


Heating and Cooling Curves of X-Ray Tube Assembly

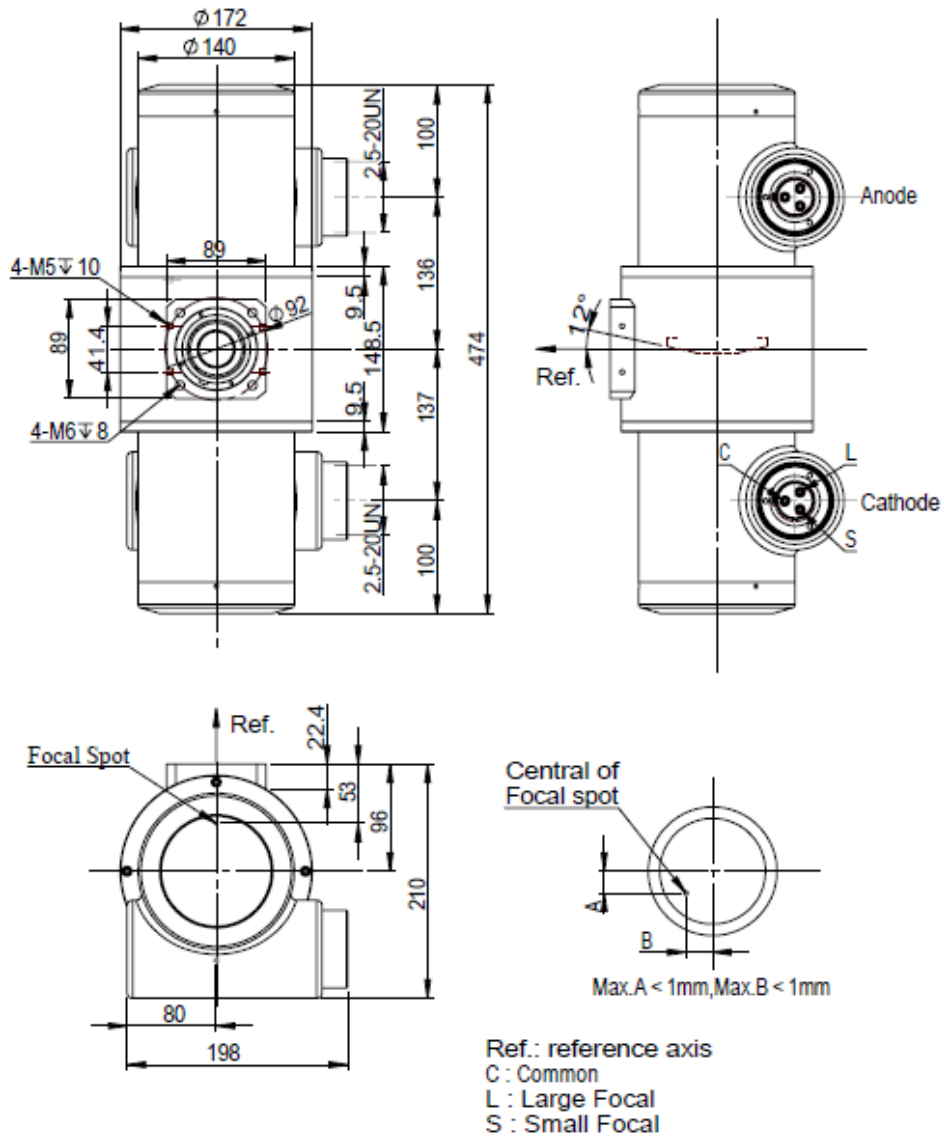


Maximum Radiation Field

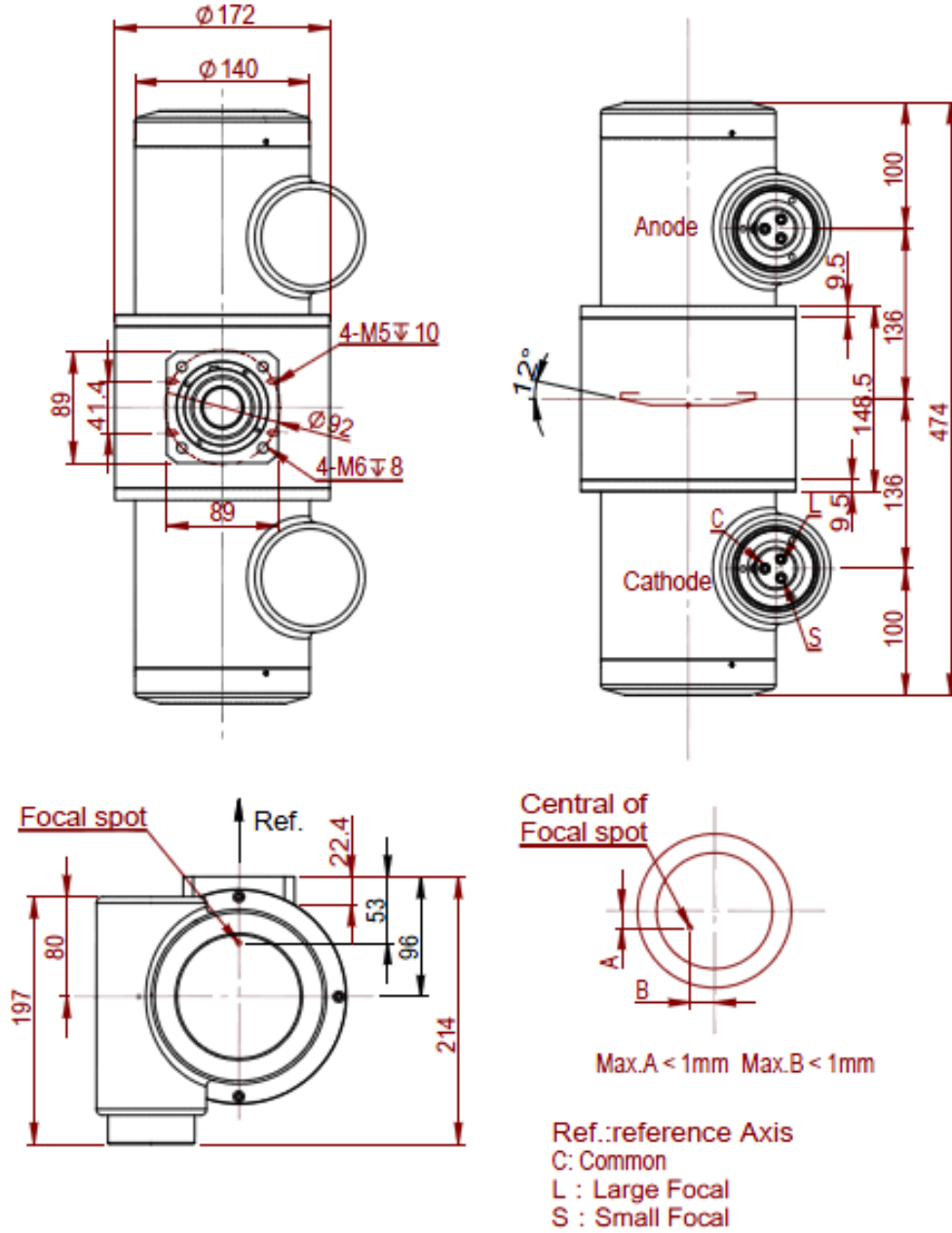
The field coverage depends on the source-image distance (SID) and the anode angle. For example field coverage of 430×430mm can be achieved at 1000mm SID with this tube assembly (12° anode angle)



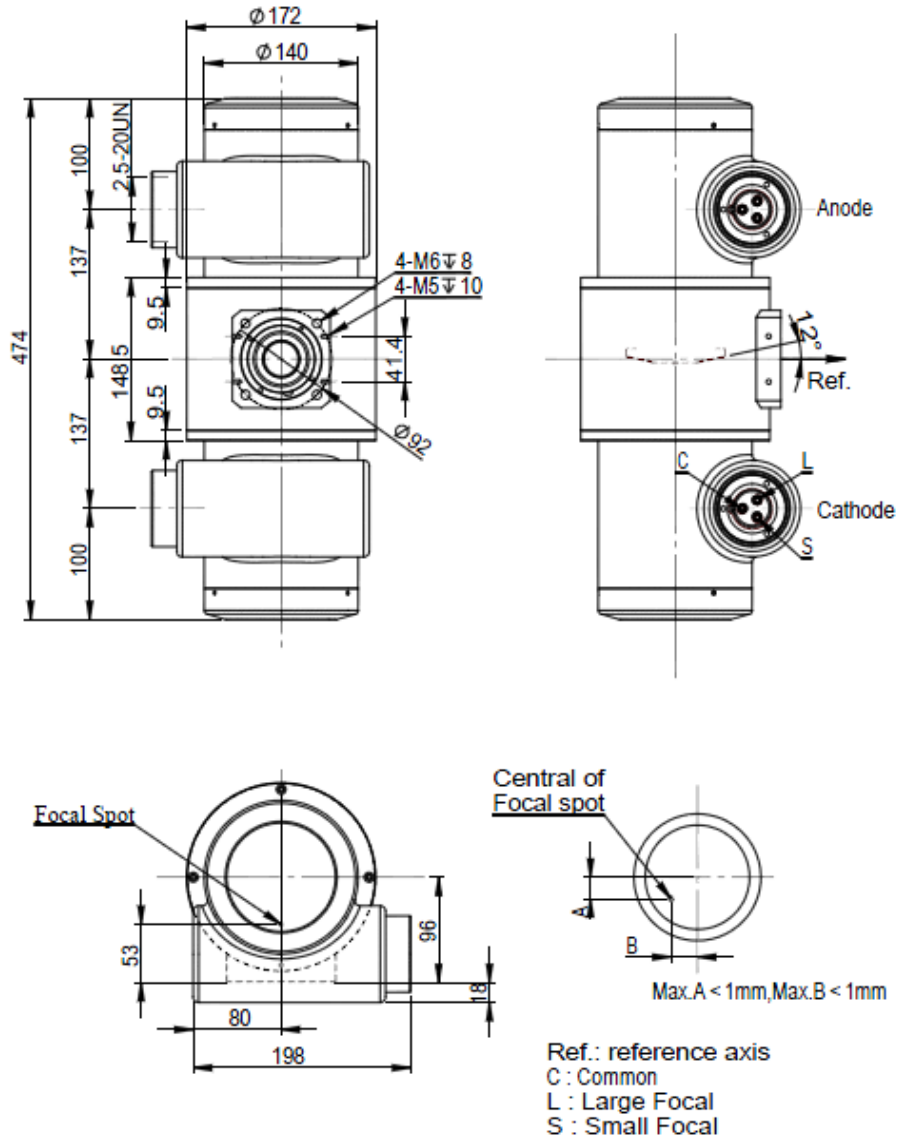
X-Ray Tube Assembly Dimensional Drawings - H2100X



X-Ray Tube Assembly Dimensional Drawings - H2100Y



X-Ray Tube Assembly Dimensional Drawings - H2100Z



Cautions!!!

X-ray tube will emit X-ray when it is energized with high voltage, Special knowledge should be required and cautions need to be taken when handling it.

1. Only a qualified specialist with X-Ray tube knowledge should assemble, maintain and remove the tube. When mounting tube inserts adopt proper caution, in order to avoid glass bulb breaking and fragments projection. Please use protective gloves and glasses.
2. Tube insert connected to H.V. supply is a radiation source: be sure to take all necessary safety cautions.
3. Wash thoroughly with alcohol the external surface of tube insert (care of fire risk). Avoid contact of dirty surfaces with cleaned tube insert.
4. Clamp system inside housing or self-contained units must not mechanically stress the tube.
5. After installation, check the right working of the tube (no fluctuation of tube current nor crackling).
6. Comply with insert thermal parameters, planning and programming the exposure parameters and cooling pauses. Housing or self-contained units must be provided with an adequate thermic protection.
7. Voltages indicated in charts are valid for transformer supplied with ground center.
8. It is extremely important to observe the connection diagram and the grid resistor value. Any change could modify the dimensions of the focal spot, also varying diagnostic performances or overloading anode target.
9. Tube inserts contain environment polluting materials, particularly lead liner tubes. Please apply to qualified operator for waste disposal, according to local regulation requirements.
10. When any abnormalities are found during operation, immediately switch off the power supply and contact the service engineer.

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Notes

- This high vacuum product is produced according to state-of-the-art technology. To prevent implosion please handle with care and use protective devices, e.g. glasses!
- In the interest of complying with legal requirements concerning the environmental compatibility of our products (protection of natural resources, avoidance of waste) we endeavor to reuse components and to return them to the production cycle. We guarantee the functioning, quality and life of these components by taking extensive quality assurance measures, just as for factory-new components.

The Hangzhou Kailong Medical instruments Co., Ltd. is ISO 13485 certified, manufactures in accordance with the Quality System Regulations (QSR) as defined by the Food and Drug Administration (FDA) and endeavors to comply with legal requirements concerning the environmental compatibility of its products.

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