

E79005X

Rotating Anode X-ray Tube Assembly

- ◆ Compact X-ray tube assembly for CT scanner featuring extremely high cooling performance.
- ◆ Liquid metal lubricated bearings (LM bearings) is applied in the rotation system.
- ◆ All-metal extra-heavy anode disc is constructed with specially processed rhenium-tungsten-faced molybdenum alloy target.
- ◆ The anode heat content is 1420 kJ (2000 kHU) and the maximum anode heat dissipation rate is 4 kW.

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	135 kV
Nominal Focal Spot Value:	
Large Focus	1.7 × 1.7
Small Focus	1.1 × 1.3
Nominal Anode Input Power (4s):	
Large Focus	36 kW
Small Focus	24 kW
Nominal CT Anode Input Power:	
Large Focus.....	36 kW
Small Focus.....	24 kW
Nominal CT Scan Power Index (CTSPI):	
Large Focus.....	27 kW
Small Focus.....	21 kW

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Motor Ratings:

Stator: XS-AQ

	Starting	Ready ON	Ready OFF
Driven Frequency [Hz]	50	50	50
Input Power [W]	820	570	380
Voltage [V]	152	134	110
Current [A]	6.6	5.5	4.3
Min. Speed Up [s]	2.7	-	-
Coil Resistance [Ω]	10	10	10

Note 1) To be obtained with 3-phase starter ST-7013 or equivalent.

2) These data are indicating standard values.

3) Anode keeps continuous rotation regardless X-ray output.

Anode Speed Minimum 2700 min⁻¹

Stator:

Type Three-phase

Each Winding Impedance 10 Ω Resistance between Housing and Low Voltage Terminals Minimum 2 M Ω
(Measured by DC500V)

Heat Exchanger Input Power 360W

Heat Exchanger Input Voltage Single-phase AC 200 V

Heat Exchanger Source Frequency 50/60Hz

Normal Operating Range of the Housing Temperature 16 ~ 75 °C

Mode of Operation Intermittent

Envelope Current (135kV / 100mA) (Approx) 10 mA

Envelope Voltage (135kV / 100mA) 0 kV

Mechanical:

Dimensions See Dimensional Outline

Overall Length 493 mm

Maximum Diameter 213 mm

Target:

Anode Angle 7 degrees

Diameter 132 mm

Construction Rhenium-tungsten

Permanent Filtration 1.1 mm Al / 75 kV IEC60522:1999

Radiation Protection:

X-ray Leakage Maximum 0.87 mGy/h

Leakage Technique Factor 135 kV, 22 mA

X-ray Coverage:

Longitudinal Direction of Tube Axis Anode Side 3.3°
Cathode Side 21°Perpendicular Direction of Tube Axis $\pm 27^\circ$

Weight (Approx.):

Tube Housing Unit 38.2 \pm 0.25 kgHeat Exchanger 16.4 \pm 0.25 kg

High Voltage Receptacle To Meet Requirements of IEC60526 Corrigendum 1:2010

Cooling Method Heat Exchanger

Position During Operation $\pm 30^\circ$ with Respect to Tube Axis

Position During Shipping Anode Facing Upward

Tube Housing Model Number XH-168

Centrifugal Acceleration During Rounding in a Gantry Maximum 6.3 \times 9.8 m/s²

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

Maximum X-ray Tube Voltage	135 kV
Between Anode (or Cathode) and Ground	67.5 kV
Minimum X-ray Tube Voltage	80 kV
Maximum X-ray Tube Current:	
Large Focus	300 mA
Small Focus	220 mA
Maximum Filament Current (25 kHz Maximum):	
Large Focus	5.2 A
Small Focus	5.2 A
Filament Voltage (25 kHz Maximum):	
Large Focus (At Maximum Filament Current 5.2 A)	9.7 ~ 13.2 V
Small Focus (At Maximum Filament Current 5.2 A)	10.1 ~ 13.8 V
Continuous Anode Input Power	2.0 kW (5.63 kHU/s)
Thermal Characteristics:	
Maximum Anode Heat Content	1420 kJ (2000 kHU)
Maximum Anode Heat Dissipation	4 kW (5.64 kHU/s)
X-ray Tube Assembly Heat Content	3750 kJ (5280kHU)
Nominal Continuous Input Power:	
With Heat Exchanger, Ambient Temperature 25°C	Maximum 3.2 kW
With Heat Exchanger, Ambient Temperature 40°C	Maximum 2.4 kW
Oil Temperature	80 °C

Peak Power Input Ratings:

Do not exceed these value in any anode heat content.

Exposure Time [sec]	Peak Power [kW]	
	Small Focal Spot	Large Focal Spot
4	24.0	36.0
10	20.9	25.6
20	18.0	22.0
30	16.1	18.6
40	14.9	16.0
60	12.7	12.7
100	9.4	9.4

Environmental Limits

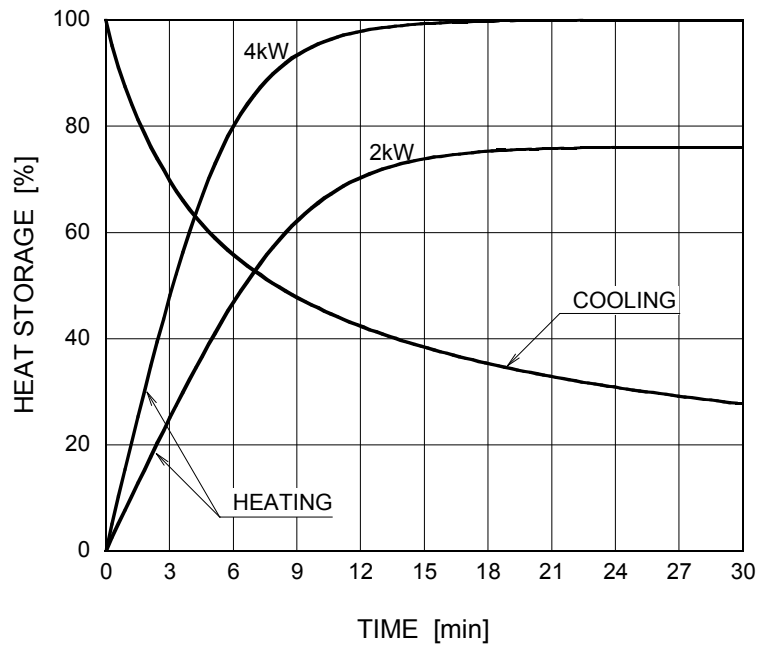
Operating Limits:

Temperature	18 ~ 45 °C
Humidity	30 ~ 80 %
	(No Condensation)
Atmospheric Pressure	70 ~ 106 kPa
Altitude.....	2000 m

Shipping and Storage Limits:

Temperature	-20 ~ 75 °C
Humidity	20 ~ 90 %
	(No Condensation)
Atmospheric Pressure	50 ~ 106 kPa

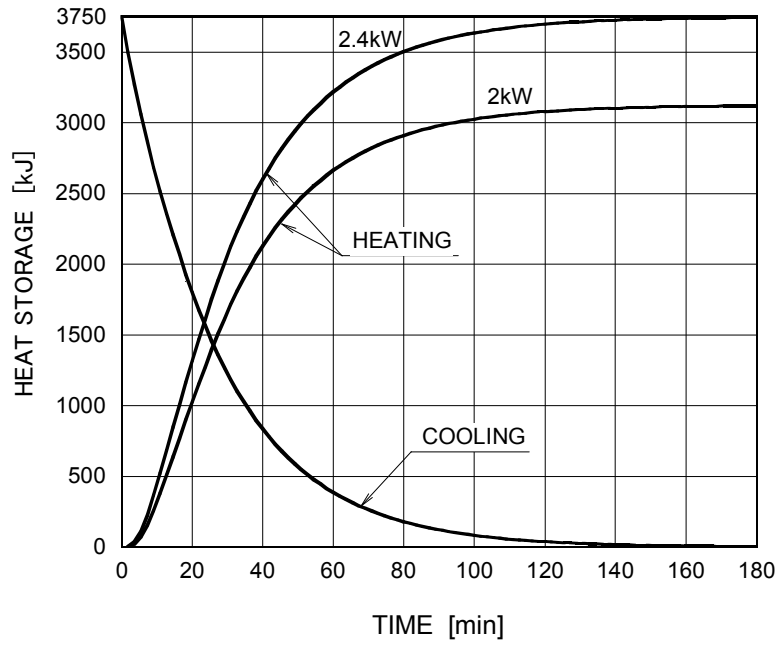
Anode Heating / Cooling Curve



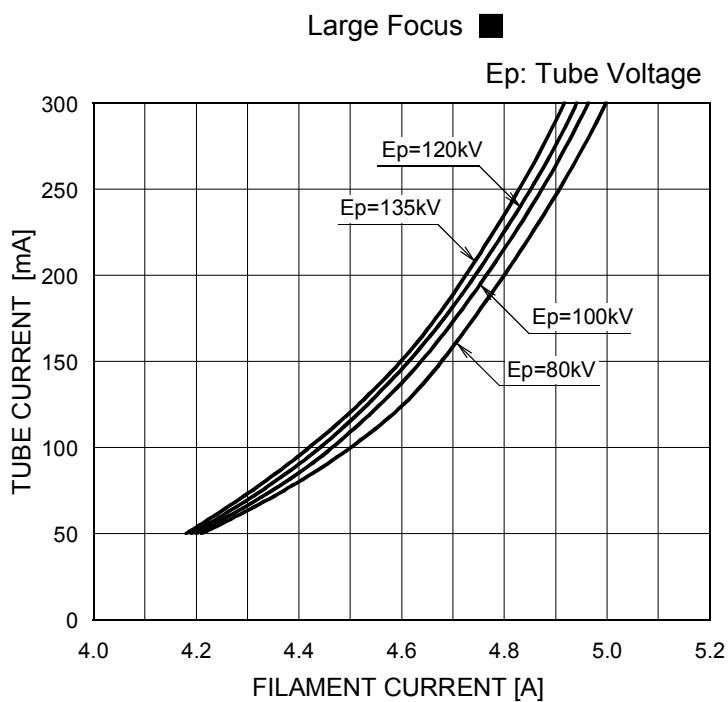
Notes

1. Heat storage of the anode is calculated based on the anode thermal characteristics. This determines the X-ray input conditions for subsequent X-ray exposure. For specifying conditions, contact CETD.
2. To avoid the over-load, the OLP (overload protection) program should be used to restrict the X-ray input conditions. The X-ray tube assembly should not be used in systems which do not incorporate the OLP program. When absolutely impossible to use a system which incorporate the OLP program, contact CETD for operating procedures.
3. Before you make the OLP program, contact CETD for the detail conditions.

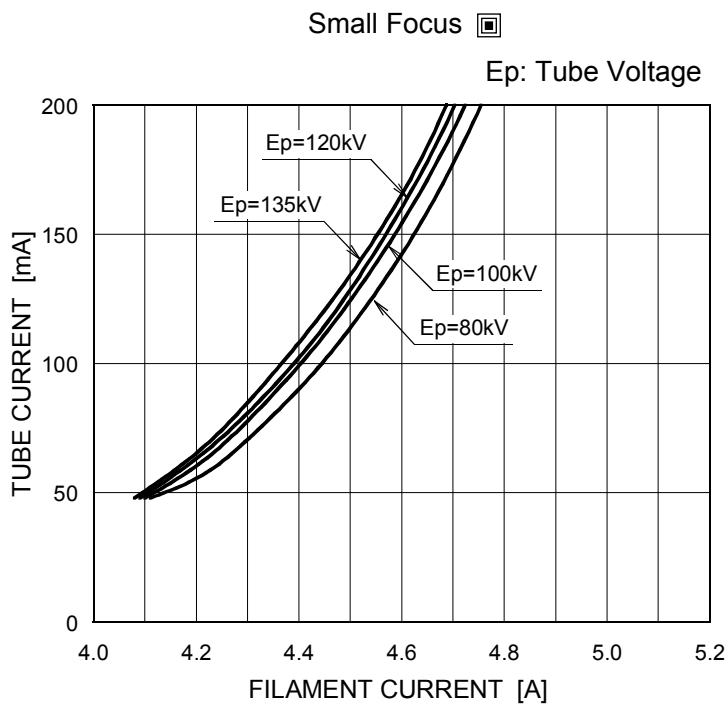
X-ray Tube Assembly Heating / Cooling Curve



Emission Characteristics

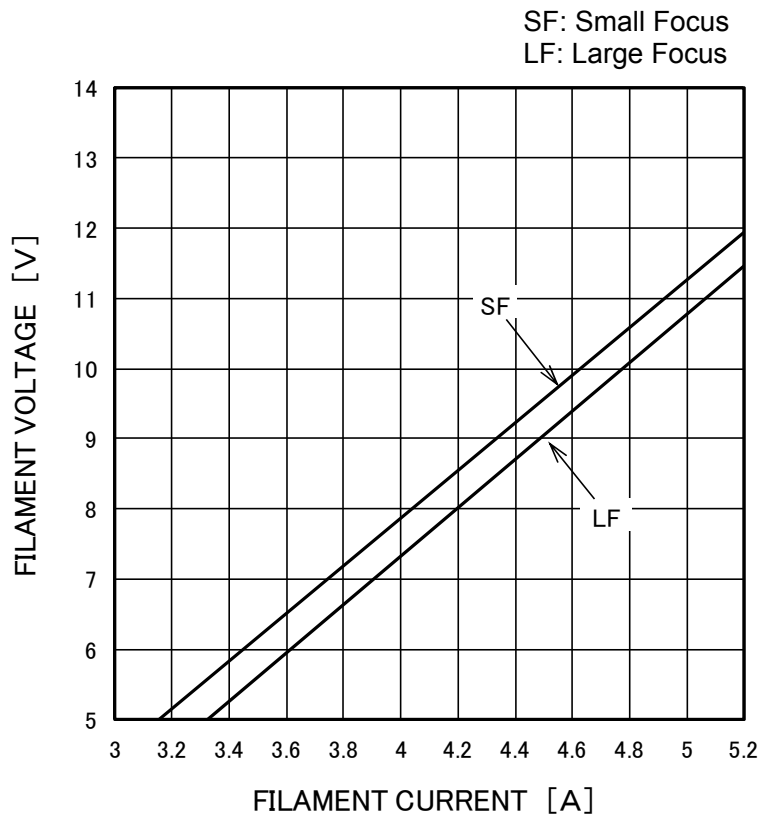


For Reference Only



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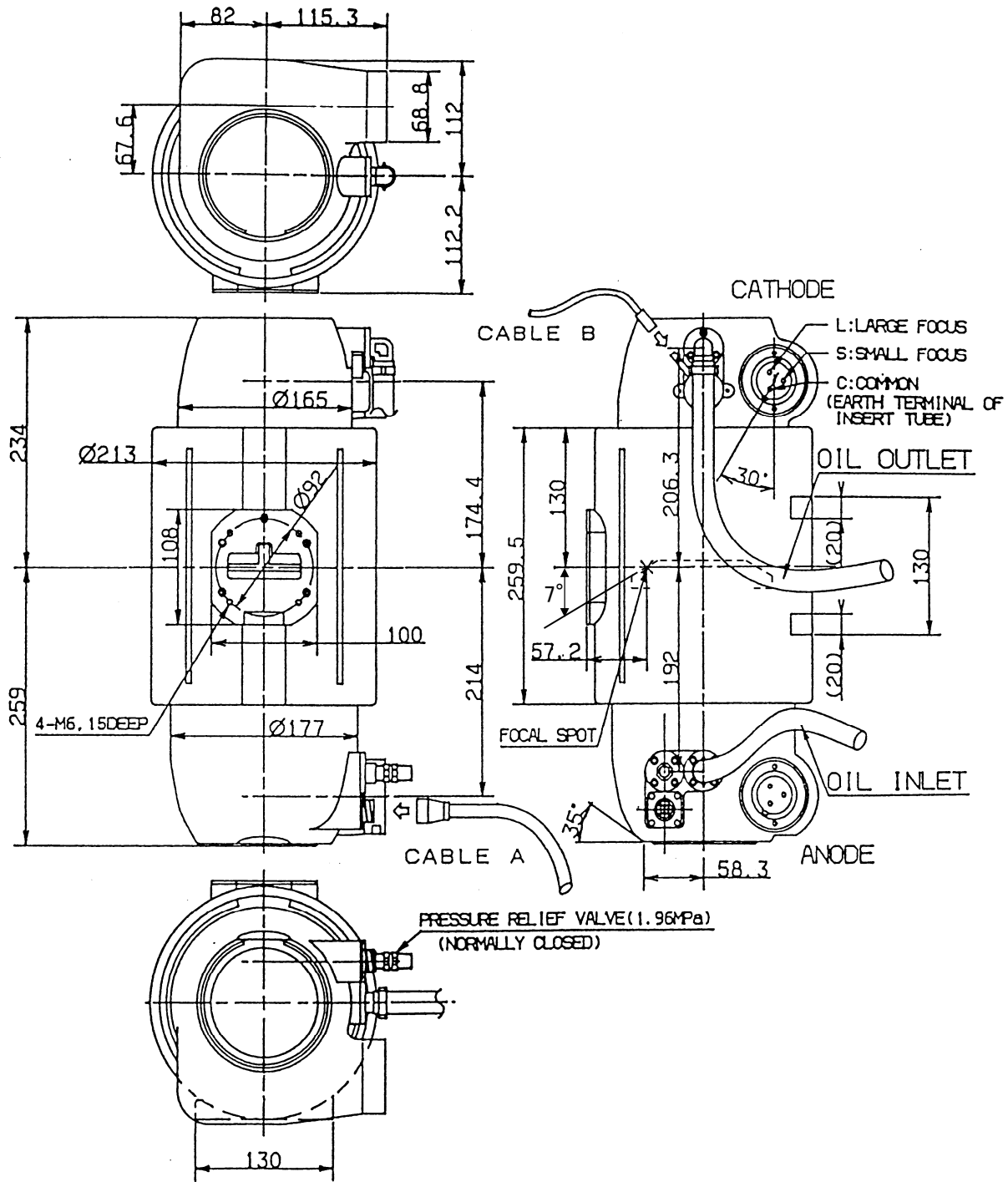
Filament Characteristics



For Reference Only

Dimensional Outline of Tube Housing Unit

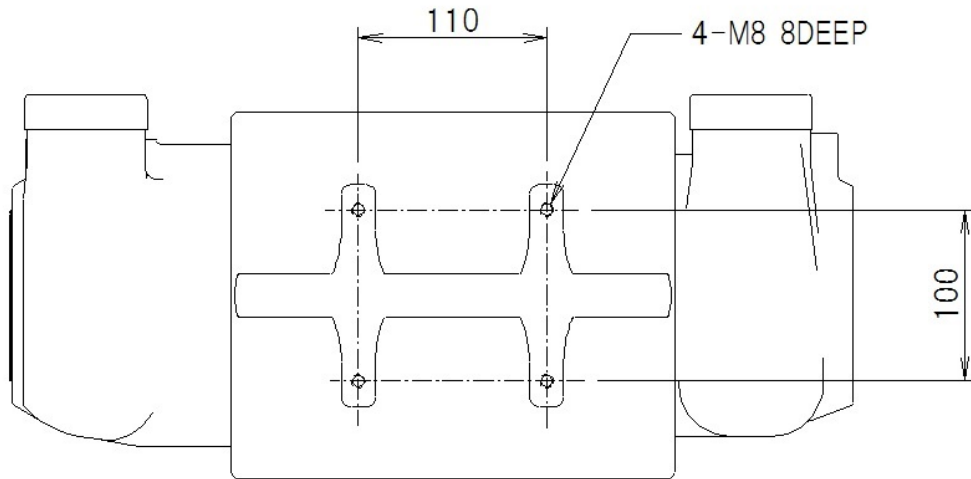
Unit : mm



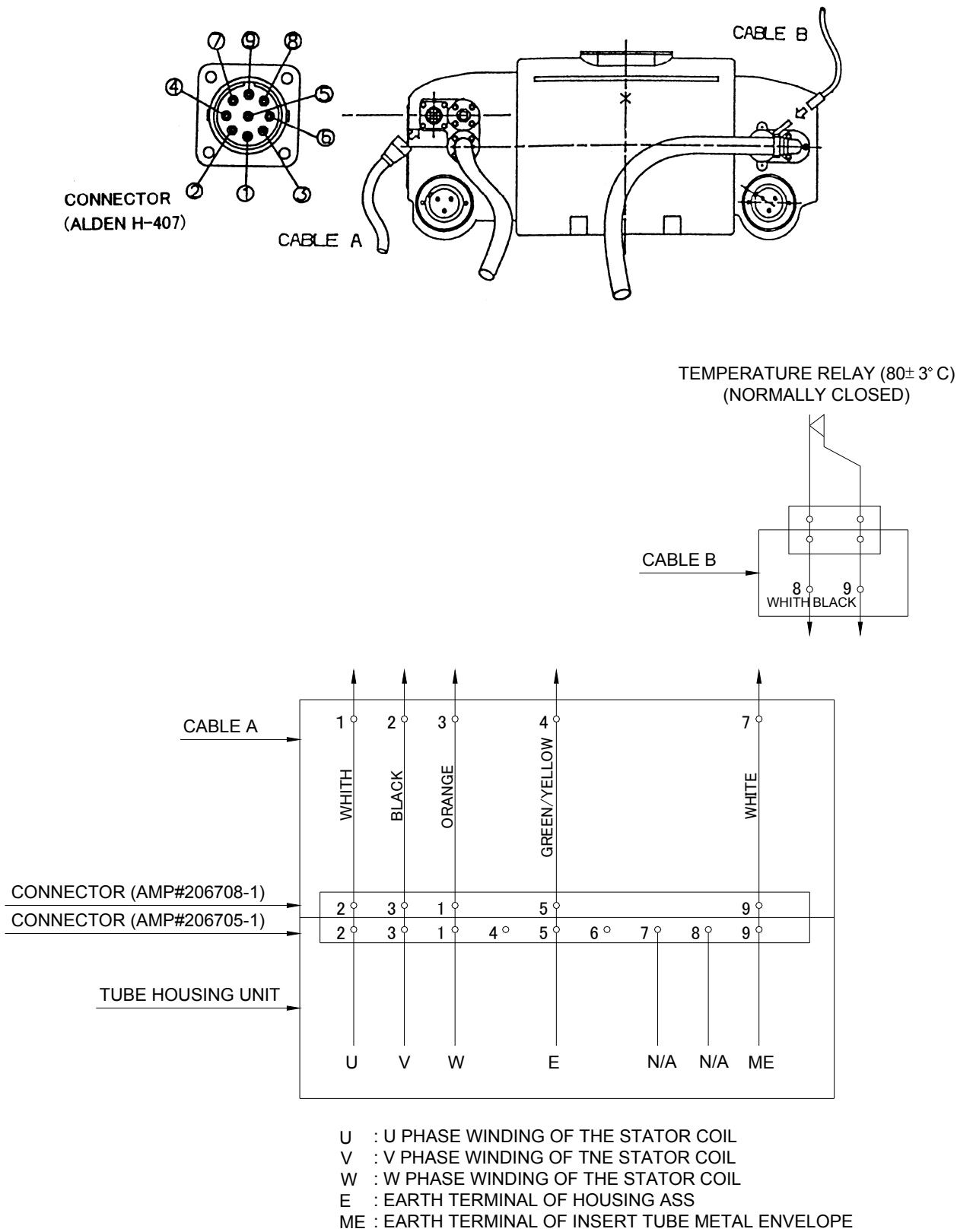
CENTRAL RAY AND REFERENCE AXIS

Position of Screw Hole for Fixing to Gantry

Unit : mm

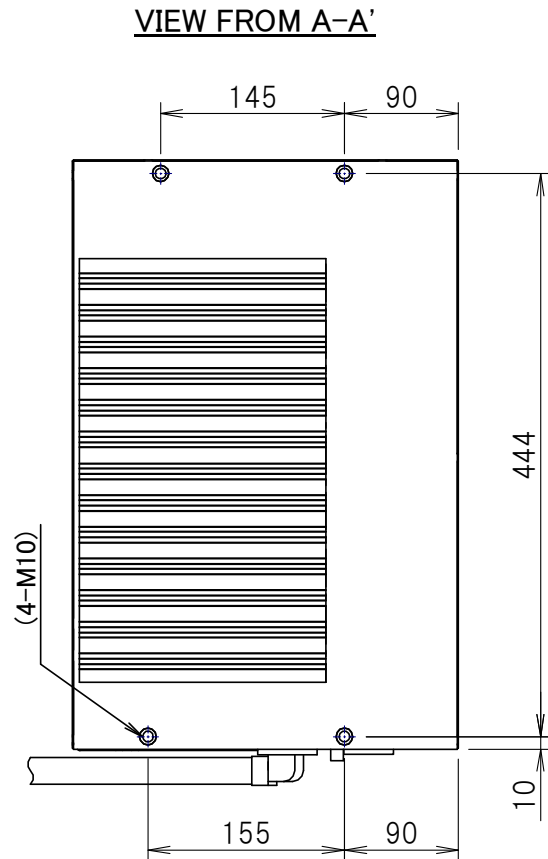
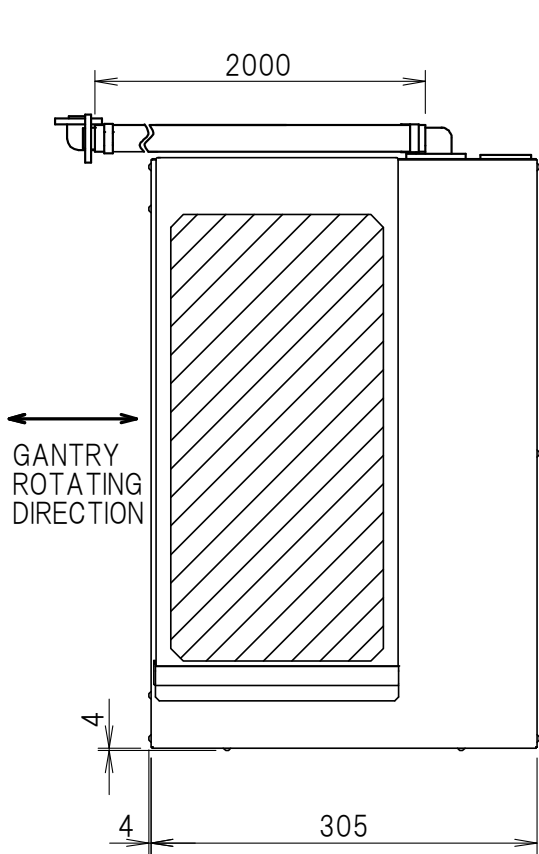
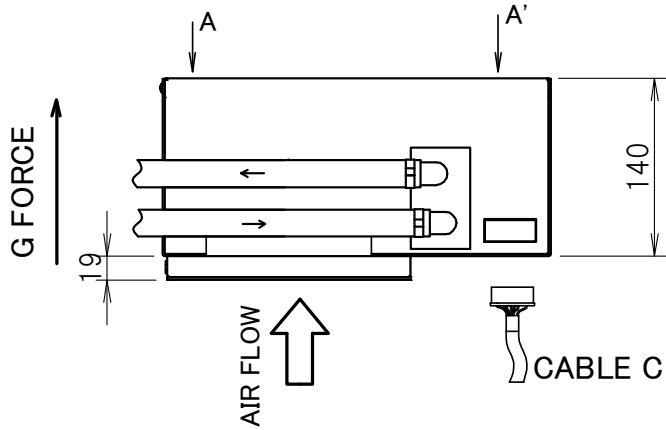


Terminal Connections of Tube Housing Unit



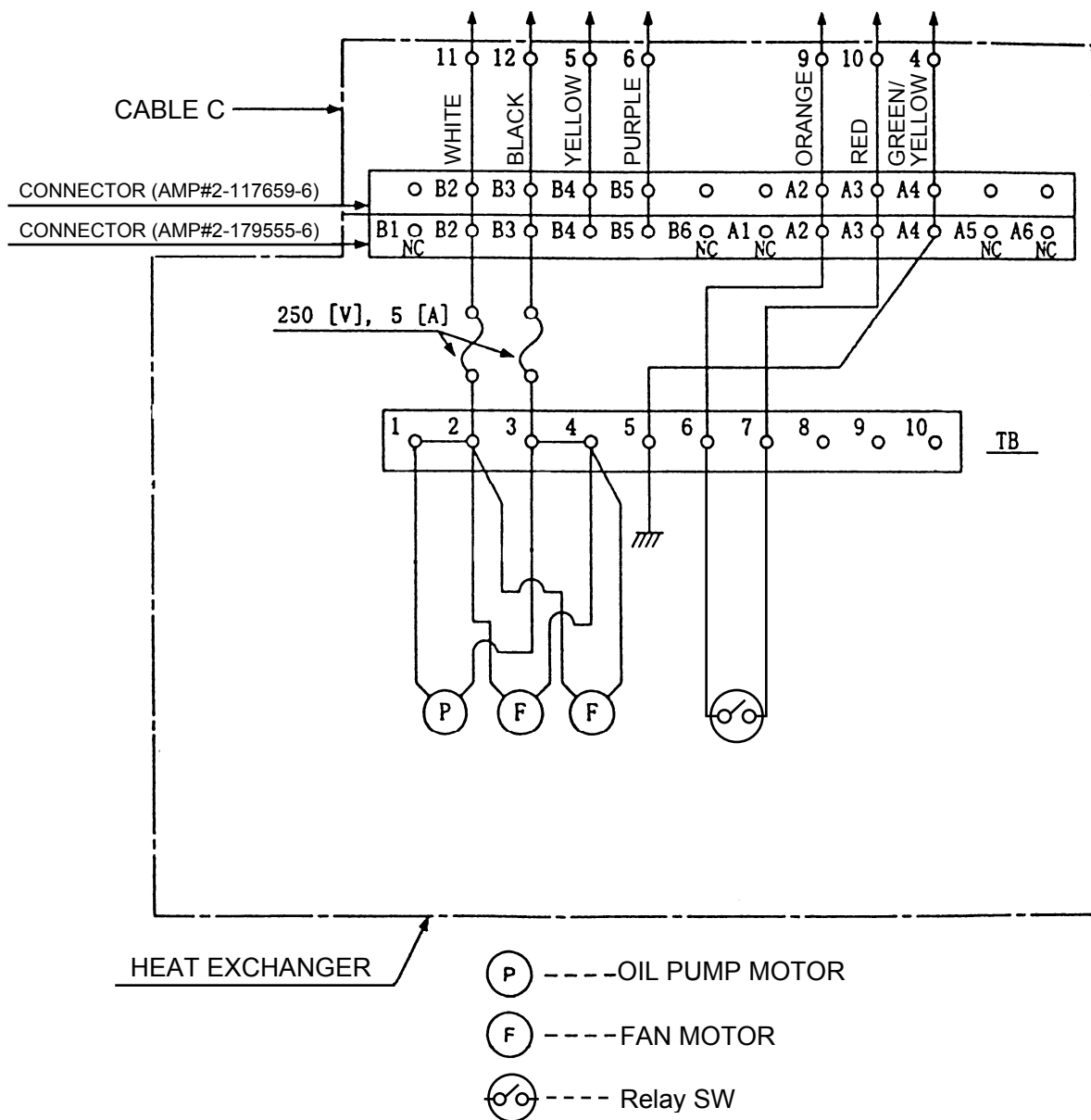
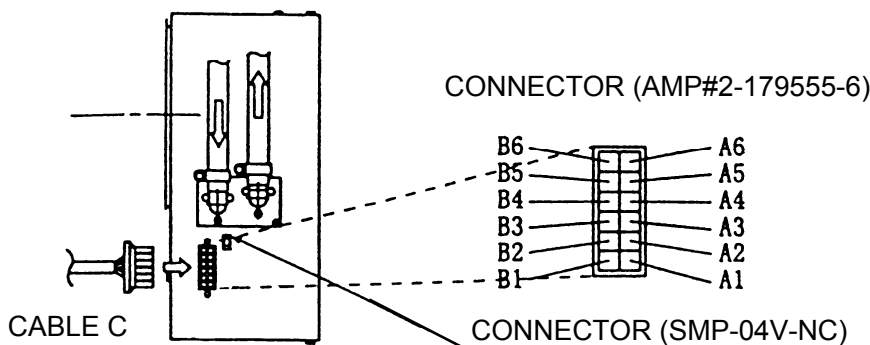
Dimensional Outline of Heat Exchanger

Unit: mm



PAINT COLOR : WHITE (Munsell N9.5)

Terminal Connections of Heat Exchanger





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·Canon Electron Tubes & Devices Co., Ltd. has been certified to meet all the requirements of Quality Management Systems ISO9001 and ISO13485.
Product scope is referred to the following URL. <https://etd.canon/company/quality.htm>.