CEG-16

IRRADIATION X-RAY TUBE SPECIFICATION

VAREX IMAGING P/N 158002

I

REVISION	VAREX IMAGING APPROVAL	DATE
A	EC-0009642	April 2025
B	EC-0011813	November 2025

II

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1.0 APPLICATION

1.1 The specification applies to the X-ray Tube Model CEG-16.

2.0 MODEL NUMBER

2.1	Customer	CEG-16
2.2	Varex Imaging	CEG-16

2.3 CEG-16 Assembly

2.3.1 Tube Unit 158002

3.0 INSERT

3.1 Physical

3.1.1 Cathode grounded, end window, Syltherm HF cooled irradiation X-ray tube.

3.2 Anode

3.2.1 The anode is Copper with the target material attached. The anode is cooled with Syltherm HF.

3.2.2	Target Material	Tungsten

3.2.3 Target surface is parallel to the Beryllium window

3.3 Electrical

3.3.1	kVP Maximum	Anode-to-ground 180 kVP

3.4 Filament (Cathode)

3.4.1 The filament is Tungsten and the leads are insulated from the grounded support and focusing structure, but must be maintained at ground potential.

3.4.2	Typical Operating Voltage Range	20-35 Volts DC
3.4.3	Typical Operating Current Range	7-10 Amperes
3.4.4	Maximum Filament Current	11.5 Amperes

(in-rush current limit required)

3.4.5 Insulation Resistance at 500 VDC

Filament to ground > 500 MΩ
Target to ground > 500 MΩ
Filament to target > 500 MΩ

3.4.6 Filament Characteristics — Refer to Figure 1

3.5 Input Rates

3.5.1 Maximum Load — 16,000 Watts

3.5.2 Operating kV Range (at 16kW max) — 120 – 180 kV

3.5.3 Rating Charts — Refer to Figure 2

3.6 Vacuum Quality

3.6.1 Maximum Pressure — 1.0 x 10-4 Torr

3.6.2 Degradation Limit

3.6.2.1 No more than one logarithmic scale in Torr

4.0 HOUSING ASSEMBLY

4.1 Physical

4.1.1 Weight — 122 lbs. (55 kg)

4.2 Outline Drawing — Refer to Figure 3

4.3 X-ray Beam

4.3.1 Target to Window Distance — 36 mm

4.3.2 Be Window Opening — 146 mm

4.4 Inherent Filtration — 4.32 mm Beryllium

4.5 Electrical

4.5.1 Cable Receptacles

4.5.1.1 Anode — R28

		4.5.1.2 Filament	62" No. 14 AWG

4.6 Cooling

	4.6.1	Anode and Cathode Cooling Flow Minimum	19 L/min
		4.6.1.1 Fittings: PARKER Nipple - FF-502-10FO PARKER COUPLER - FF-501-10FO	
	4.6.2	Cooling Medium	Syltherm HF
	4.6.3	Cooling Temperature at Inlet (Max)	35°C
	4.6.4	Pressure at Inlet (Max)	6 Bar

5.0 TESTING

5.1 Final Acceptance Test

	5.1.1	Stability	
		5.1.1.1 180kV, 89mA for 1 hour	0 Arcs Max

5.2 Customer Acceptance Test

	5.2.1	Stability 180kV, 89mA for 1 hour	0 Arcs Max
	5.2.2	Radiation Leakage Test	
		5.2.2.1 Customer is responsible for compliance with domestic and/or international cabinet X-ray regulations (responsibility of the customer) and shall be achieved at the system level.	

6.0 SEASONING & DAILY WARM-UP

6.1 Seasoning Procedure — Refer to Figure 4

7.0 SYSTEM DATA

7.1 Thermal

	7.1.1	Maximum System Heat Generated	16,000 Watts

7.2 Environmental Limits

7.2.1 Operating Limits (must be non-condensing environment)

7.2.1.1	Temperature	5°C to 40°C
7.2.1.2	Humidity	30% to 90%

7.2.2 Shipping & Storage Limits (Be window Vacuum Cap is required)

7.2.2.1	Temperature	-10°C to +70°C
7.2.2.2	Humidity	10% to 95%

7.3 Modifications

7.3.1 It is necessary to consult with Varex Imaging for any technical modifications to the tube.

7.4 Regulatory

7.4.1 RoHS and REACH

7.5 Label - Each unit will be labeled with the following:

7.5.1	Serial/Model Number	Refer to Figure 5
7.5.2	Be Label	Refer to Figure 5

7.6 Documents - Each unit will be shipped with the following documents:

7.6.1	Tube Service Report	133232
7.6.2	Customer Data Sheet	Refer to Figure 6

8.0 RETURN PROCEDURE

8.1 Defective Units

8.1.1 If the unit fails to meet the requirements specified in Section 2.0 through 7.0. The unit will be returned to Varex Imaging with a completed X-ray Test Checklist.

8.1.2 Returned units shall be packed in original shipping cartons.

9.0 REVISION

A

1. Establish.

B

1. Update Be thickness.

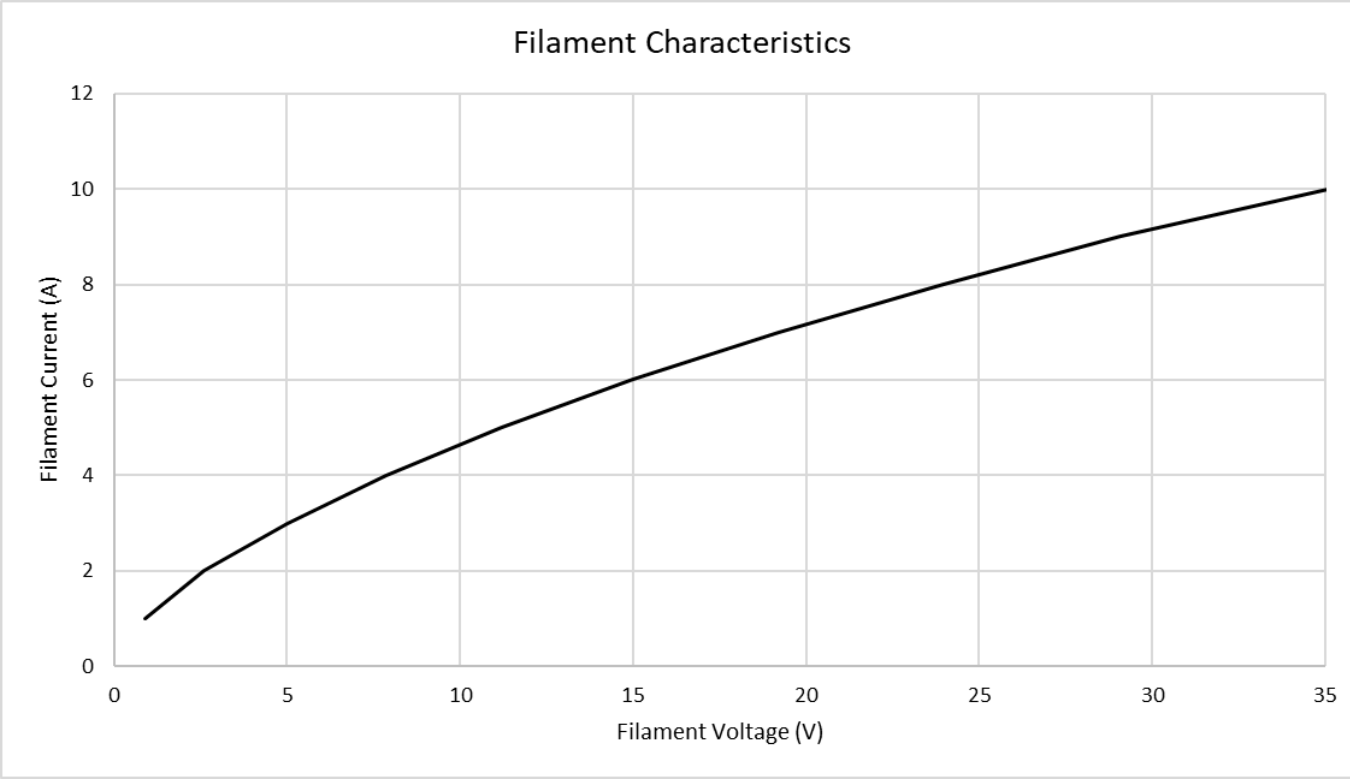

Figure 1 Filament Characteristics

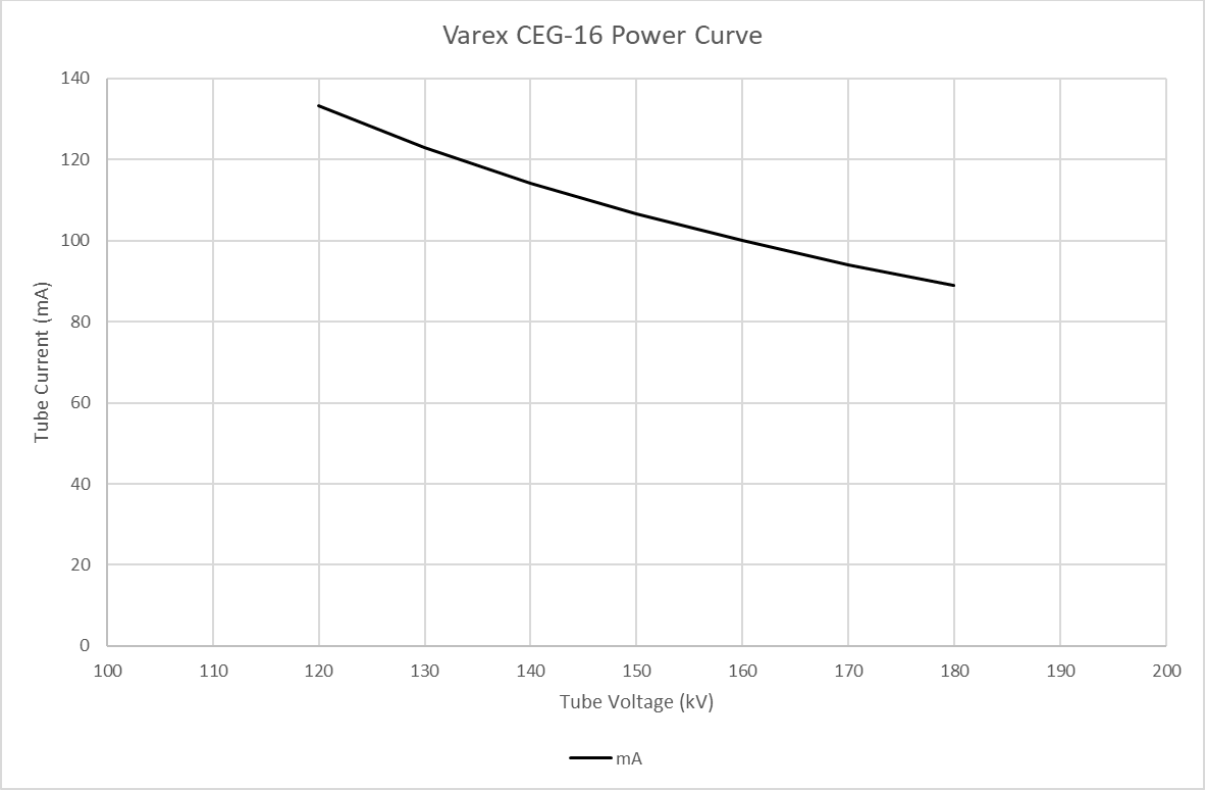

Figure 2 Rating Chart

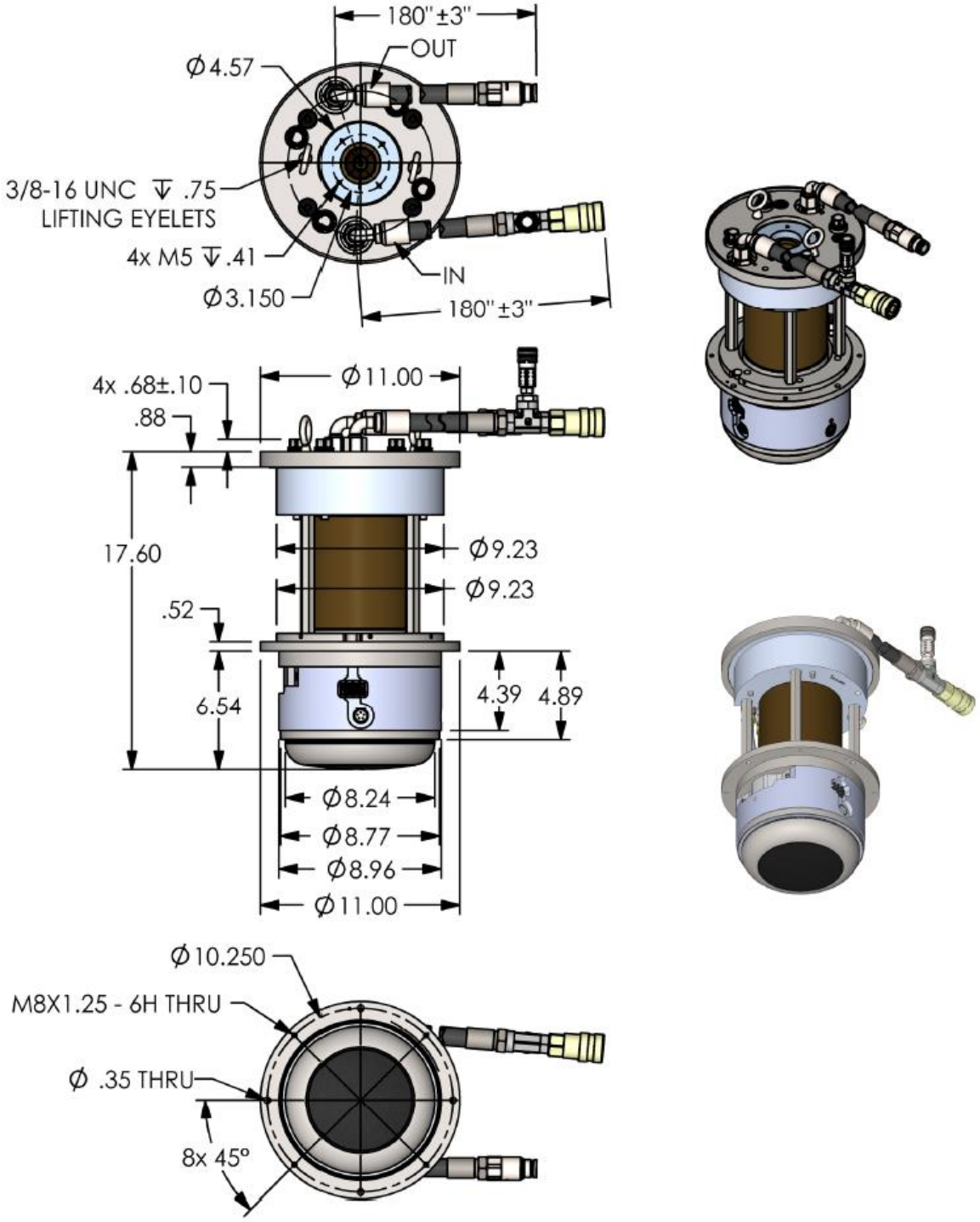

Figure 3 Outline Drawing (10013029)

Schedule for Warm-up

Warm-up should be run after 24 hours of idle time.

kV	mA	Ramp (min)	Hold (min)
75	10	0.5	2
125	40	0.5	2
170	40	0.5	2
180	40	0.5	2

Figure 4 Schedule for Warm-Up

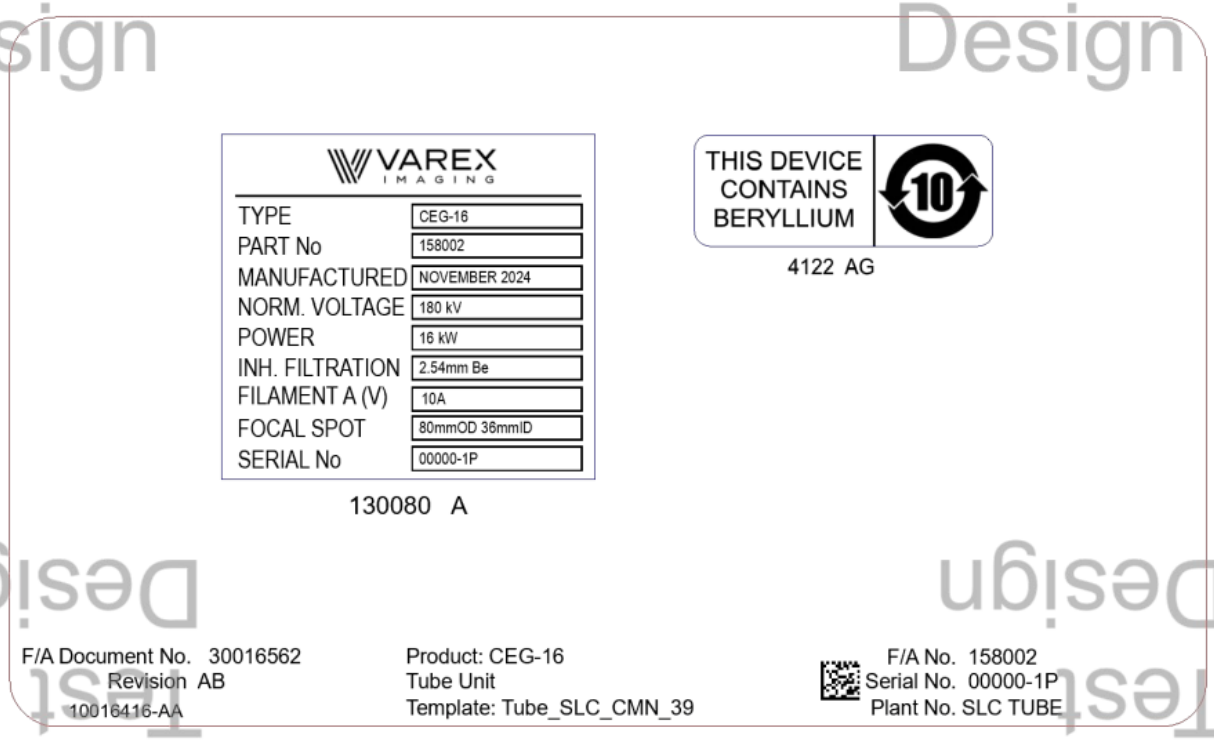

Figure 5 Labels

CEG-16
CUSTOMER SPECIFICATION

51915-987-AA
P/N 158002

Tube Certification
Report CEG-16

Tube Type : CEG-16
Serial Number _____

Item	Standard	Results
Full Power Test	180 kV, 89 mA 60 min, 0 kicks	_____

Do Not Print - Not Compliant

Sign: _____

Date _____

Verify

Figure 6 Customer Data Sheet