EG-60

Industrial X-Ray Tube

Product Description

The EG-60 series of beryllium window X-Ray tubes are designed for use as radiation sources in energy-dispersive fluorescence analysis systems.

These various versions of tubes differ in beryllium window thickness - as indicated by the presence of a suffix (see SPECIFICATION - Inherent Filtration).

A variety of target materials are available (see SPECIFICATION). These tubes can operate at voltages as low as 5 kVcp.

The X-Ray beam is perpendicular to the target, providing a very uniform cone of radiation over a wide angle. This feature allows short focal spot-to-sample distances.

Maximum X-Ray intensity is achieved by use of a thin beryllium window which is the only element of inherent filtration.

Product Description

The cathode is designed for operation at ground potential:

- eliminating the need for a highly insulated filament transformer; and
- eliminating electron bombardment of the beryllium window and the resultant heating.

The X-ray window is located at the end of the tube, and the X-ray beam is projected along the longitudinal axis of the tube.

Most tube enclosures require some type of forced cooling (usually oil-water or forced oil) to maintain oil temperature below 150°F (65°C) at maximum ratings. The highest oil temperature occurs next to the anode, particularly in the glass re-entrant cavity surrounding the anode. Forced oil circulation in this area is required.

SPECIFICATIONS

Maximum Voltage: 60 kV

Target Angle: 90° from central ray

Anode Dissipation:
400 watts (maximum) continuous operation @ 11.5 liters/min. oil flow
300 watts intermittent operation @ 11.5 liters/min. oil flow

Focal Spot: Round focal spot approximately 8mm in diameter

Filament Characteristics:
3.3 volts, maximum
8.8 amperes, maximum
(except as limited by maximum power capability) SEE EMISSION CHART

Note (1) The high-voltage circuit should contain at least 1 ohm of added resistance for each volt of maximum operating voltage.
Note (2) All tubes incorporate a ceramic cathode insulator which make them compatible for use in helium spectrometers.

Maximum Bulk Oil Temperature: 150°F (65°C)

Weight: Approximately 1 lb. (.5 kg)

Envelope:
Concentric metal cathode ring surrounding a beryllium X-ray window, and a glass section to support and insulate the anode.

SPECIFICATIONS

Anode: Vacuum cast copper with target as specified below. External metal surfaces dull nickel plated.

Standard Target Materials:
Molybdenum (Mo), Tungsten (W), Rhodium (Rh), Platinum (Pt), Titanium (Ti), Palladium (Pd)

Cathode:
Circular tungsten filament concentric with axis of anode and X-ray window.

Cooling Method:
Forced convection in surrounding insulating oil. Oil must be forced across the anode shaft at 11.5 liters per minute.

Insulating Medium:
Oil with minimum dielectric strength of 30 kV rms per 0.1 inch, as measured by ASTM Standard Test No. D-877

ORDERING NOTES
When ordering specify:
- beryllium window thickness (by using appropriate suffix - see SPECIFICATION - Inherent Filtration)
- target material (see SPECIFICATIONS - Standard Target Materials)

Radiation Characteristics		
Tube Type	Inherent Filtration Beryllium Window Thickness	Radiation Cone (Unshadowed)
EG-60E	.030 [.76] mm	46°
EG-60J	.003 [.076] mm	23° or 46°

⚠ Warning

Beryllium windows permit a very high level of long wavelength X-radiation to pass through, which can cause injury to humans.

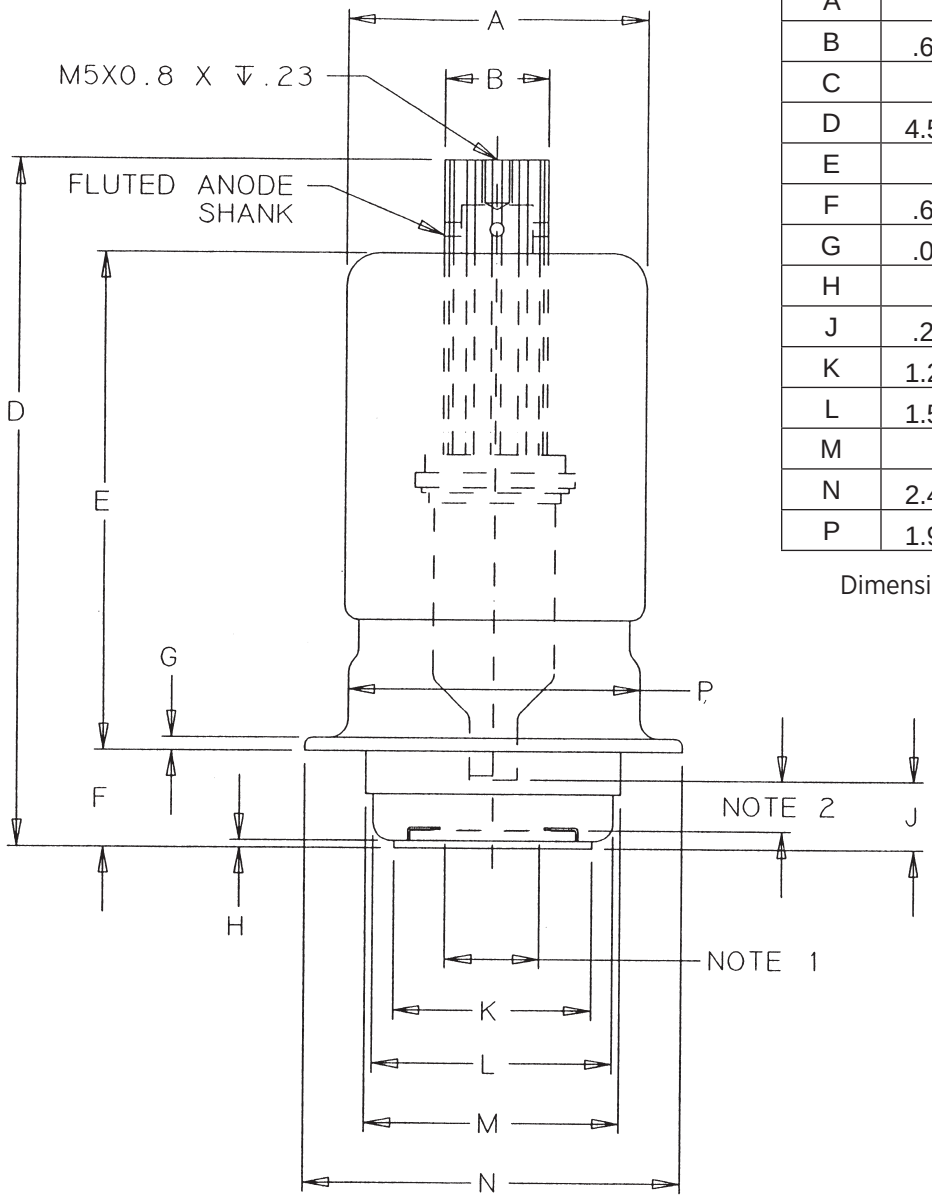
Injury may occur from even very short exposures to the primary X-ray beam.

Note: The radiation dosage rate cannot be accurately measured with conventional radiation measurement instruments. Radiation intensity in each installation will vary, and calibration must include the effects of long wavelength X-radiation.

Tube Outline Drawing

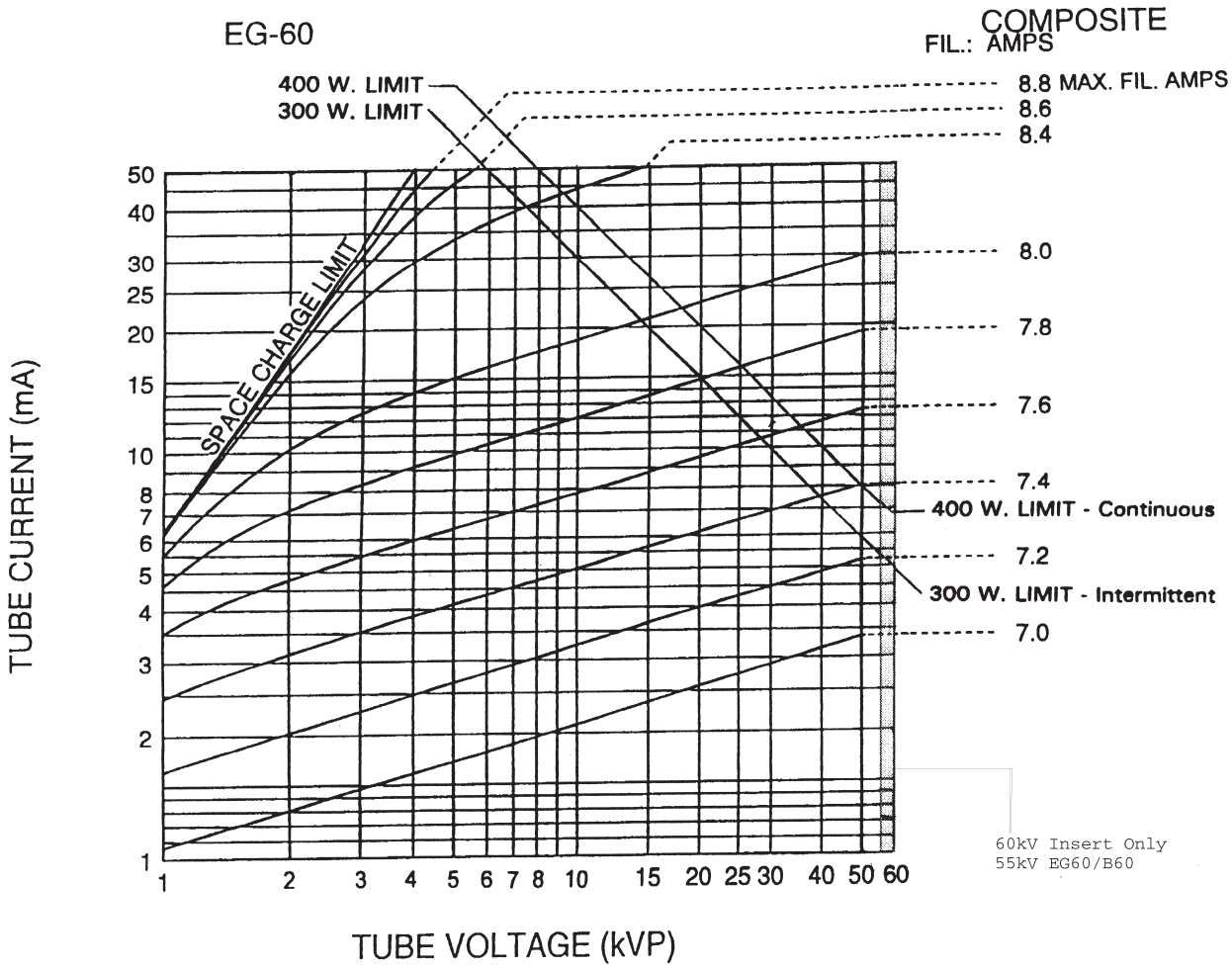
DIM	MIN	MAX	REF
A		2.00	
B	.68	.72	
C			
D	4.57	4.65	
E		3.33	
F	.64	.69	
G	.08	.10	
H		.06	
J	.29	.38	
K	1.29	1.33	
L	1.58	1.60	
M			1.69
N	2.48	2.52	
P	1.93	1.95	

Dimensions are in inches



NOTES:

1. Be WINDOW MIN. CLEAR WINDOW .625" OR .48"
2. ANODE TO BACK OF Be WINDOW .20"



Salt Lake City, UT 1-801-972-5000
Charleston, SC 1-843-767-3005
www.varexim aging.com

Manufactured by Varex Imaging Corporation

Specifications subject to change without notice.