TECHNICAL DATA

2CX10,000F
HIGH-VACUUM
DIODE

The EIMAC 2CX10,000F is a ceramic/metal forced-air cooled high-vacuum diode designed for clipper or charging service. It employes a thoriated-tungsten filament to allow fast warmup. Flexible filament leads are used to simplify connection to the source of filament power so that no socket is required.

The tube is normally mounted by clamping around the periphery of the anode cooler.

Up to 12 kilowatts may be safely dissipated by the anode with the recommended forced-air cooling.

GENERAL CHARACTERISTICS[1]

ELECTRICAL

Filament: Thoriated-tungsten filament	
Voltage	7.0 V
Current at 7.0 Volts	110 A
Peak Inverse Plate Voltage	35 kv
Maximum Plate Dissipation	12 kW
DC Plate current (see note 2)	8.0 A
Peak Plate Current	25 a

1. Characteristics and operating values are based on performance tests. These figures may change without notice as the result of additional data or product refinement. Varian EIMAC should be consulted before using this information for final equipment design.
2. The average plate current rating is based on use of a choke input filter with the current waveform essentially rectangular.

MECHANICAL

Maximum Overall Dimensions	
Length (including flexible filament leads)	17.75 in; 45.1 cm
Diameter (anode cooler)	7.05 in; 17.9 cm
Net Weight	11 lbs; 5 kg
Operating Position	Vertical, Base Down or Up
Maximum Operating Temperature	
Ceramic/Metal Seals	250°C
Anode Core	250°C
Base	Special, with Flexible Filament Leads
Cooling	Forced Air
Recommended Socket	None Required
Available Air System Chimney (use is dependent on tube mounting)	EIMAC SK-1306

251430 (Effective May 1984)
VA4692

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APPLICATION

MECHANICAL

MOUNTING - The tube must be mounted vertically, base up or down, and should be protected from vibration and shock. The tube is normally mounted by a clamping arrangement around the periphery of the anode cooler.

COOLING - The maximum temperature rating for the external surfaces of the tube is 250 °C, and sufficient forced-air cooling must be used in all applications to keep the temperature of the anode (at the base of the cooling fins) and the temperature of the ceramic/metal seals comfortably below this rated maximum.

It is considered good engineering practice to design for a maximum anode core temperature of 225°C and temperature-sensitive paints are available for checking base and seal temperatures before any design is finalized. EIMAC Application Bulletin #20 titled "TEMPERATURE MEASUREMENTS WITH EIMAC TUBES" is available on request.

It is also good practice to allow for variables such as dirty air filters and the fact that the anode cooling fins may not be clean if the tube has been in service for some length of time. Special attention is required in cooling the center of the stem (base), by means of special directors or other provision. An air interlock system should be incorporated in the design to automatically remove all voltages from the tube in case of even partial failure of the tube cooling air.

The cooling data shown is for the anode cooler only, with incoming air at 50°C maximum and a maximum tube temperature of 225°C, with air flowing in a base-to-anode direction. The pressure drop values shown are approximate.

Altitude	Plate Diss. (kW)	Flow Rate (cfm)	Press. Drop In.Water
Sea Level	8.0	226	1.0
	10.0	280	1.2
	12.0	360	1.6
5000 feet	8.0	273	1.1
	10.0	337	1.4
	12.0	470	2.0

Air flow must be applied before or simultaneously with the application of power, including the tube filament, and should normally be maintained for a short period of time after all power is removed to allow for tube cooldown.

ELECTRICAL

FILAMENT OPERATION - The rated nominal filament voltage for the tube is 7.0 volts as measured at the flexible lead terminals with a known-accurate rms-responding meter. For good life and consistent performance the voltage should be maintained within plus or minus five percent.

ABSOLUTE MAXIMUM RATINGS - The values shown for each type of service are based on the "absolute system" and are not to be exceeded under any service conditions. These ratings are limiting values outside which the serviceability of the tube may be impaired. In order not to exceed absolute ratings the equipment designer determine an average design value for each rating below the absolute value of that rating by a safety factor so that the absolute values will never be exceeded under any usual conditions of supply voltage variation in the equipment itself. It does not necessarily follow that combinations of absolute maximum ratings can be attained simultaneously.

HIGH VOLTAGE - Normal operating voltages used with this tube are deadly, and the equipment must be designed properly and operating precautions must be followed. Design all equipment so that no one can come in contact with high voltages. All equipment must include safety enclosures for high-voltage circuits and terminals, with interlock switches to open primary circuits of the power supply and to discharge high-voltage capacitors whenever access doors are opened. Interlock switches must not be bypassed or "cheated" to allow operation with access doors open. Always remember that HIGH VOLTAGE CAN KILL.

X-RADIATION HAZARD - High-vacuum tubes operating at voltages higher than 15 kilovolts produce progressively more dangerous X-ray radiation as the voltage is increased. This tube, operating at its rated voltages and currents, is a potential X-ray source. Only limited shielding is afforded by the tube envelope. Moreover, the X-radiation level may increase significantly with tube aging and gradual deterioration, due to leakage paths or

emission characteristics as they are effected by the high voltage. X-ray shielding may be required on all sides of tubes operating at these voltages to provide adequate protection throughout the life of the tube. Periodic checks on the X-ray level should be made, and the tube should never be operated without required shielding in place. If there is any question as to the need for or the adequacy of shielding, an expert in this field should be contacted to perform an equipment X-ray survey. In cases where shielding has been found to be required operation of high voltage equipment with interlock switches "cheated" and cabinet doors open in order to be better able to locate an equipment malfunction can result in serious X-ray exposure.

SPECIAL APPLICATIONS - When it is desired to operate this tube under conditions widely different from those listed here, write to Varian EIMAC; attn: Applications Engineering; 301 Industrial Way; San Carlos, CA 94070 U.S.A.

OPERATING HAZARDS

PROPER USE AND SAFE OPERATING PRACTICES WITH RESPECT TO POWER TUBES ARE THE RESPONSIBILITY OF EQUIPMENT MANUFACTURERS AND USERS OF SUCH TUBES. ALL PERSONS WHO WORK WITH OR ARE EXPOSED TO POWER TUBES OR EQUIPMENT WHICH UTILIZES SUCH TUBES MUST TAKE PRECAUTIONS TO PROTECT THEMSELVES AGAINST POSSIBLE SERIOUS BODILY INJURY. DO NOT BE CARELESS AROUND SUCH PRODUCTS.

The operation of this tube may involve the following hazards, any one of which, in the absence of safe operating practices and precautions, could result in serious harm to personnel:

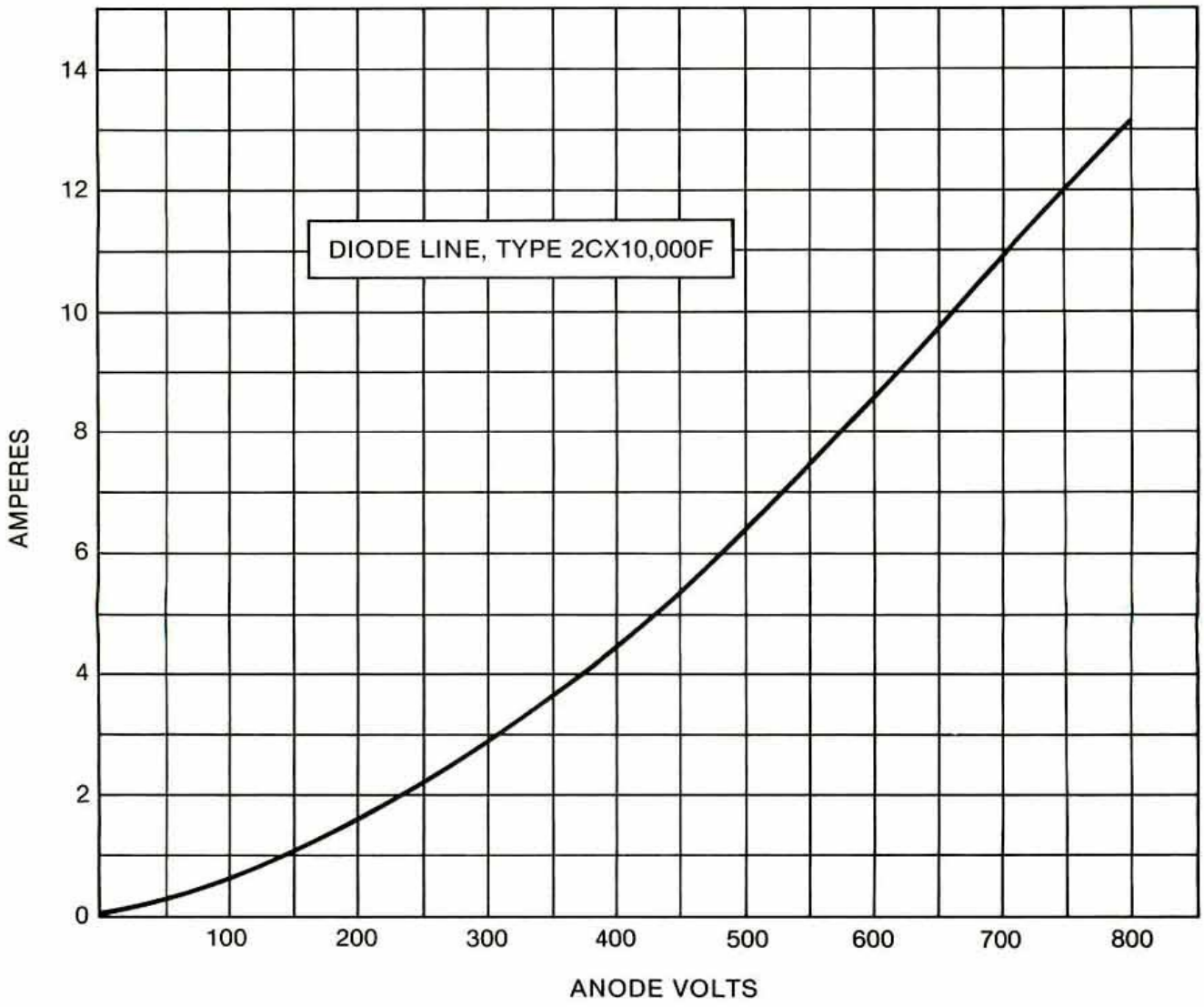
a. HIGH VOLTAGE - Normal operating voltages can be deadly. Remember that HIGH VOLTAGE CAN KILL.

b. LOW-VOLTAGE HIGH-CURRENT CIRCUITS - personal jewelry, such as rings, should not be worn when working with filament contacts or connectors as a short circuit can produce very high current and melting, resulting in severe burns.

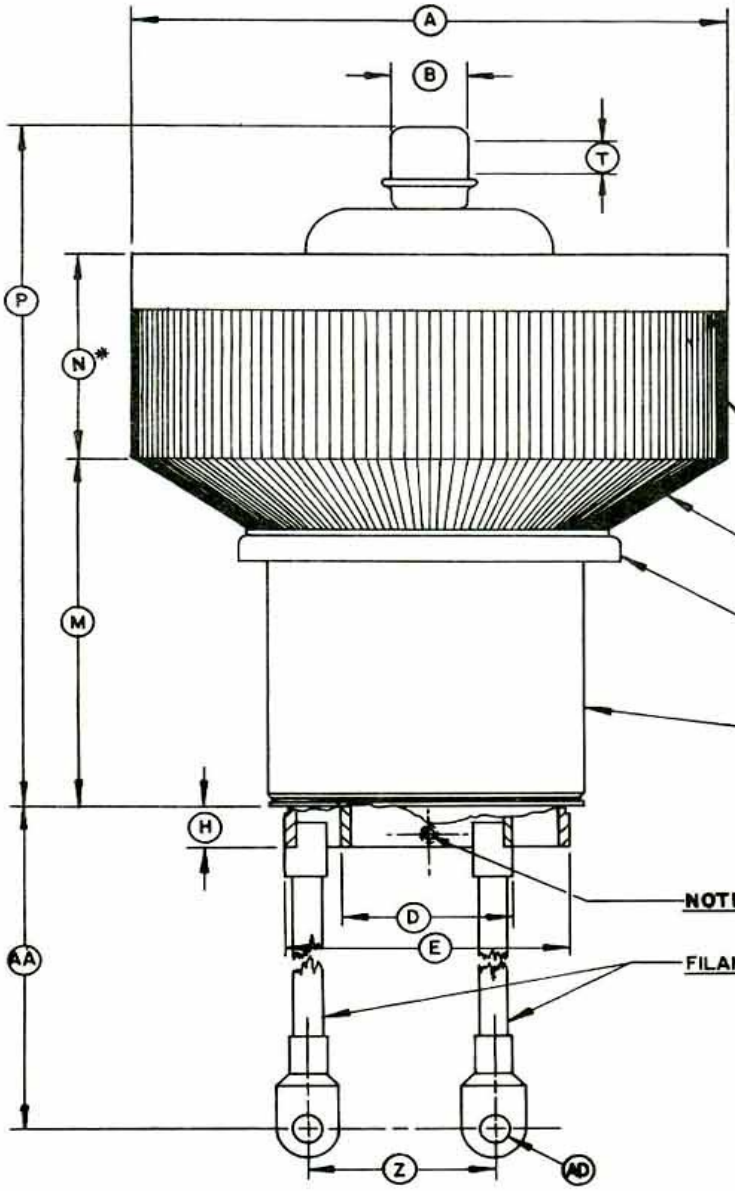
c. X-RAY RADIATION - High-voltage diode rectifiers can produce dangerous X-Radiation, which may increase with age and gradual tube deterioration due to leakage paths or tube emission characteristics as they are affected by high voltage. Shielding may be required.

d. HOT SURFACES - Surfaces of air-cooled tubes can reach temperatures of several hundred °C and cause serious burns if touched for several minutes after all power is removed.

Please review the detailed operating hazards sheet enclosed with each tube, or request a copy from: Varian EIMAC, Power Grid Application Engineering, 301 Industrial Way, San Carlos CA 94070.


DIODE LINE, TYPE 2CX10,000F
AMPERES
0
2
4
6
8
10
12
14
100
200
300
400
500
600
700
800
ANODE VOLTS

DIMENSIONAL DATA						
	INCHES			MILLIMETERS		
DIM.	MIN	MAX	REF.	MIN.	MAX.	REF.
A	6.928	7.050		175.97	179.07	
B	.855	.895		21.72	22.73	
D			1.875			47.63
E			3.250			82.55
H	.530	.700		13.46	17.78	
M	3.950	4.300		100.33	109.22	
N	2.412	2.788		61.26	70.82	
P	8.250	8.750		209.55	222.25	
T	.375			9.53		
Z			2.000			50.80
AA	8.500	9.000		215.90	228.60	
AD			.390			9.91



NOTES:

1. REF DIMENSIONS ARE FOR INFO ONLY & ARE NOT REQUIRED FOR INSPECTION PURPOSES.
2. (*) CONTACT SURFACE.
3. 10-32 TAPPED HOLES IN CONTACT RINGS. (ONE HOLE EA. RING, IN LINE.)