

EIMAC

A Division of Varian Associates
SAN CARLOS, CALIFORNIA

3CX5000H3

INDUSTRIAL
MEDIUM-MU

AIR-COOLED
POWER TRIODE

The EIMAC 3CX5000H3 is an air-cooled ceramic-metal power triode designed primarily for use in industrial radio-frequency heating services. Its air-cooled anode is conservatively rated at 5 kilowatts maximum plate dissipation with low pressure drop.

Input of 25 kilowatts is permissible up to 90 megahertz. Plentiful reserve emission is available from its 560 watt filament. The grid structure is rated at 150 watts making this tube an excellent choice for severe application.

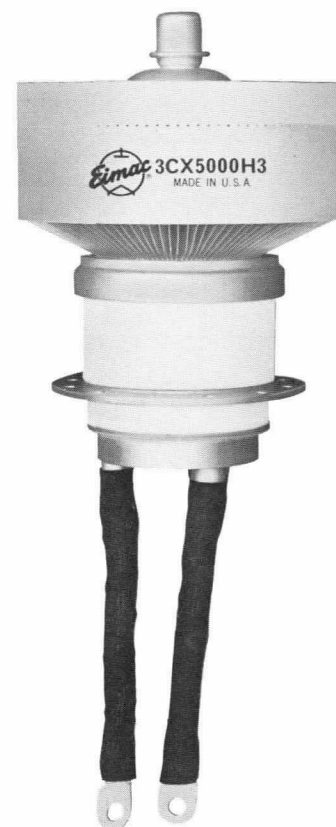
GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated-Tungsten	<u>Min.</u>	<u>Nom.</u>	<u>Max.</u>	
Voltage - - - - -		7.5		Volts
Current - - - - -	73		78	amps
Amplification Factor - - - - -		20		
Interelectrode Capacitances, Grounded Cathode Connection:				
Input - - - - -			53	$\mu\mu\text{f}$
Output - - - - -			1.5	$\mu\mu\text{f}$
Grid-Plate - - - - -			25	$\mu\mu\text{f}$
Frequency for Maximum Ratings -			90	MHz

MECHANICAL

Base - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	See Outline
Operating Position - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Vertical, base up or down
Cooling - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Forced Air
Maximum Operating Temperatures -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250°C
Maximum Dimensions:																		
Height - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	See Outline
Diameter - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	See Outline
Net Weight - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10 Pounds



THESE SPECIFICATIONS ARE BASED ON DATA APPLICABLE AT PRINTING DATE. SINCE EIMAC HAS A POLICY OF CONTINUING PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

**RF INDUSTRIAL OSCILLATOR**

Class-C (Filtered DC Power Supply)

MAXIMUM RATINGS:

DC PLATE VOLTAGE	-	-	-	-	10,000 Volts
DC PLATE CURRENT	-	-	-	-	3.0 Amps
DC GRID VOLTAGE	-	-	-	-	—1000 Volts
DC GRID CURRENT	-	-	-	-	0.5 Amp
PLATE INPUT POWER	-	-	-	-	25 kW
PLATE DISSIPATION	-	-	-	-	5 kW

TYPICAL OPERATION*

DC Plate Voltage	-	-	-	-	7000	9000 Volts
DC Plate Current	-	-	-	-	2.65	2.52 Amps
DC Grid Voltage	-	-	-	-	—700	—900 Volts
DC Grid Current	-	-	-	-	0.192	0.184 Amps
Peak Positive Grid Voltage	-	-	-	-	230	230 Volts
Driving Power	-	-	-	-	179	208 Watts
Plate Input Power	-	-	-	-	18.55	22.7 kW
Plate Dissipation	-	-	-	-	4.1	4.1 kW
Plate Output Power	-	-	-	-	14.45	18.6 kW
Approximate Load Impedance	-	-	-	-	1245	1725 Ohms

*Loaded Conditions

Note: "TYPICAL OPERATION" data are obtained by calculation from published characteristic curves. No allowance for circuit losses has been made.

APPLICATION**ELECTRICAL****Filament**

The rated filament voltage for the 3CX5000H3 is 7.5 volts. Filament voltage, as measured at the tube, must be maintained at 7.5 volts plus or minus five percent for maximum tube life and consistent performance.

Control Grid Operation

The grid current rating is 0.5 ampere dc. This value should not be exceeded for more than very short periods such as during tuning. Over-current protection in the grid circuit should be provided. Ordinarily it will not be necessary to operate with more than 0.25 amperes grid current to obtain reasonable efficiency. In industrial heating service with varying loads, grid current should be monitored continuously with a dc current meter. The maximum grid dissipation rating is 150 watts.

Plate Operation

Plate over-current protection should be provided to remove plate voltage quickly in the event of an overload or an arc-over at the load. In addition current limiting power supply resistors should be used. These precautions are especially important in industrial service with its wide variations in loading.

Spark gaps from plate to ground should be used to prevent transient voltages from flashing across the tube envelope during any fault conditions.

MECHANICAL**Mounting**

The 3CX5000H3 must be mounted vertically, either base up or down. A grid contact flange is provided for bolting to a strap or a grid deck. Heavy flexible leads are provided for applying the filament voltage.

Cooling

The maximum temperature rating for the external surfaces of the 3CX5000H3 is 250°C. Sufficient forced-air cooling must be provided to keep the temperature of the anode core and the temperature of the ceramic-metal seals below 250°C. Tube life is usually prolonged if these areas are maintained at temperatures below this maximum rating. Minimum air-flow requirements to maintain anode-core and seal temperatures below 225°C with an inlet-air temperature of 50°C are tabulated for frequencies below 30 MHz.

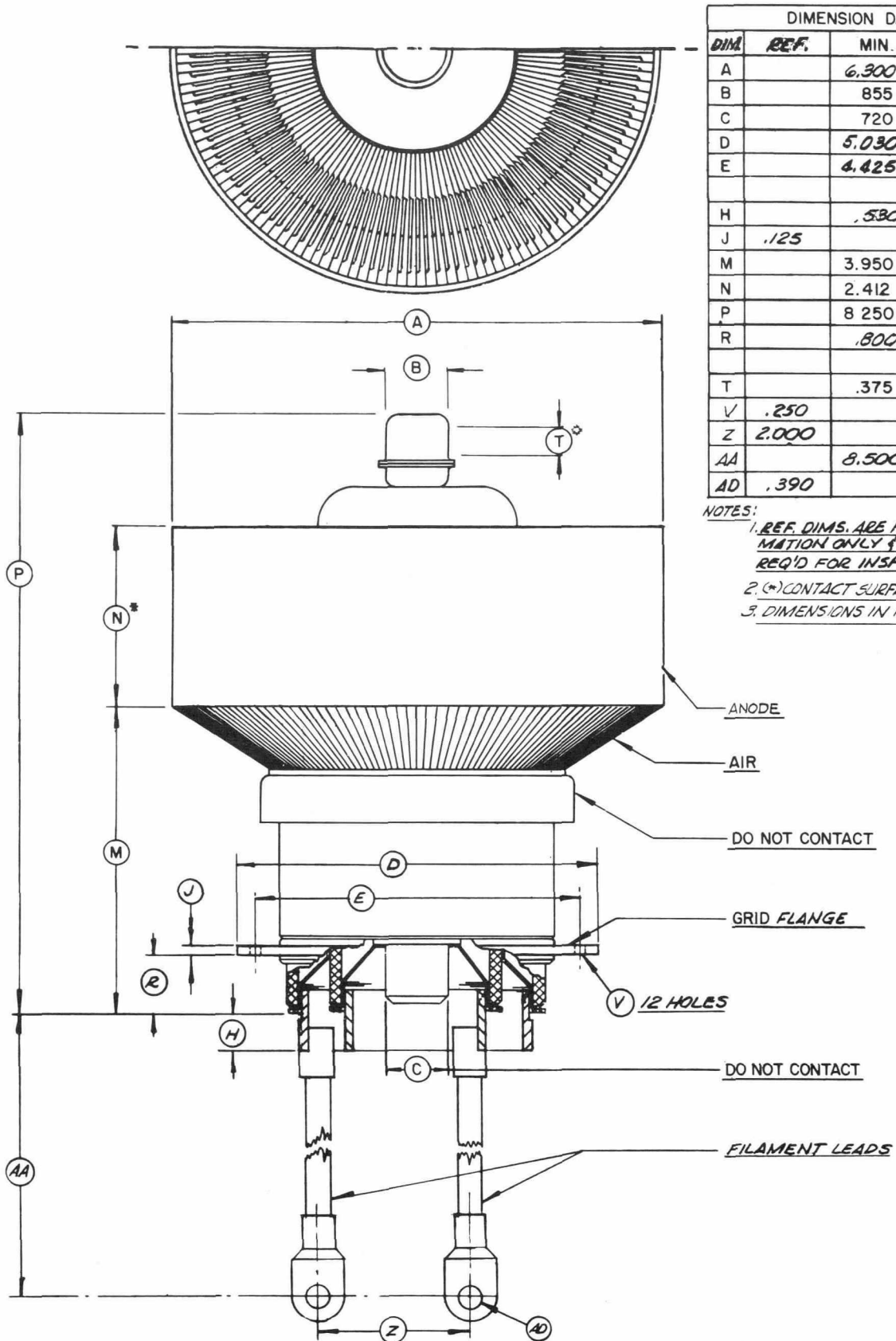
MINIMUM AIR FLOW REQUIREMENTS (Anode-to-Base Air Flow)				
	Sea Level		5000 Feet	
Plate** Dissipation watts	Air Flow CFM	Pressure Drop inches water	Air Flow CFM	Pressure Drop inches water
4000	98	0.24	118	0.29
5000	152	0.49	182	0.59
6000	236	1.00	283	1.2

**Since the power dissipated by the filament is about 560 watts and since grid dissipation can, under some circumstances, represent another 150 watts, allowance has been made in preparing this tabulation for an additional 710 watts dissipation.

Additional stem cooling air must be provided. 8 CFM of air directed against the center filament contact ring 1/2" below the outer filament contact ring by an 1 1/2" I.D. air duct arranged at a 45° angle with the center line of the tube will provide adequate cooling for 50°C ambient, 5000 ft. altitude, and 30 MHz or less.

Special Applications

If it is desired to operate this tube under conditions widely different from those given here, write to Power Grid Tube Division, EIMAC, Division of Varian, 301 Industrial Way, San Carlos, California 94070 for information and recommendations.



DIMENSION DATA

DIM.	REF.	MIN.	MAX.
A		6.300	6.400
B		855	895
C		720	760
D		5.030	5.090
E		4.425	4.445
H		.530	.700
J	.125		
M		3.950	4.300
N		2.412	2.788
P		8.250	8.750
R		.800	.860
T		.375	
V	.250		
Z	2.000		
AA		8.500	9.000
AD	.390		

NOTES:

1. REF. DIMS. ARE FOR INFORMATION ONLY & ARE NOT REQ'D FOR INSP. PURPOSES.

2. (*) CONTACT SURFACE

3. DIMENSIONS IN INCHES



3CX5000H3

EIMAC 3CX5000H3 CONSTANT CURRENT CHARACTERISTICS

— PLATE CURRENT—AMPERES
- - - GRID CURRENT—AMPERES

