

TECHNICAL DATA

3CX15,000H3

INDUSTRIAL
MEDIUM-MU

AIR-COOLED
POWER TRIODE

The EIMAC 3CX15,000H3 is an air-cooled, ceramic-metal power triode designed primarily for use in industrial radio-frequency heating services. Its air-cooled anode is rated at 15 kilowatts of plate dissipation.

Full ratings apply up to 90 megacycles. Plentiful reserve emission is available from its one kilowatt filament. The grid structure is rated at 500 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 - - - - -		6.3		Volts
Current - - - - -	152		172	amps
Amplification Factor - - - - -		20		
Interelectrode Capacitances, Grounded Cathode Connection:				
Grid-Filament - - - - -	50		60	$\mu\mu\text{f}$
Plate-Filament - - - - -	1.3		1.6	$\mu\mu\text{f}$
Grid-Plate - - - - -	30		38	$\mu\mu\text{f}$
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 - - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	13 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.

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RF INDUSTRIAL OSCILLATOR

Class-C (Filtered DC Power Supply)

MAXIMUM RATINGS:

DC PLATE VOLTAGE	-	-	-	-	12,000 Volts
DC PLATE CURRENT	-	-	-	-	6.0 Amps
DC GRID VOLTAGE	-	-	-	-	—1000 Volts
DC GRID CURRENT	-	-	-	-	1.0 Amps
PLATE INPUT POWER	-	-	-	-	60 kW
PLATE DISSIPATION	-	-	-	-	15 kW

TYPICAL OPERATION*

DC Plate Voltage	-	-	-	-	7000	10,000 Volts
DC Plate Current	-	-	-	-	6.0	5.0 Amps
DC Grid Voltage	-	-	-	-	—600	—800 Volts
DC Grid Current	-	-	-	-	660	542 mA
Peak Positive Grid Voltage	-	-	-	-	440	400 Volts
Driving Power	-	-	-	-	660	650 Watts
Plate Input Power	-	-	-	-	42	50 kW
Plate Dissipation	-	-	-	-	12	8.8 kW
Plate Output Power	-	-	-	-	30	41.2 kW
Approximate Load Impedance	-	-	-	-	600	1025 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**

For the 3CX15,000H3 the rated filament voltage is 6.3 volts. Filament voltage, as measured at the socket, should be maintained at 6.3 volts plus or minus five percent for long tube life and consistent performance. Maximum life will be obtained by operation at minus 5 percent.

Control Grid Operation

The grid current rating is one 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 0.4 to 0.6 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 500 watts.

Plate Operation

Maximum plate voltage rating of 12,000 volts and maximum plate current of 6.0 amps should not be applied simultaneously as rated plate dissipation may be exceeded.

Plate over-current protection should be provided to remove plate voltage quickly in the event of an over-load 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 3CX15,000H3 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 3CX15,000H3 is 250°C. Sufficient forced-air circulation must be provided to keep the temperature of the anode at the base of the cooling fins and the temperature of the ceramic-metal seals below 250°C. Air-flow requirements to maintain seal temperature at 225°C in 50°C ambient air are tabulated below (for operation below 30 megacycles.)

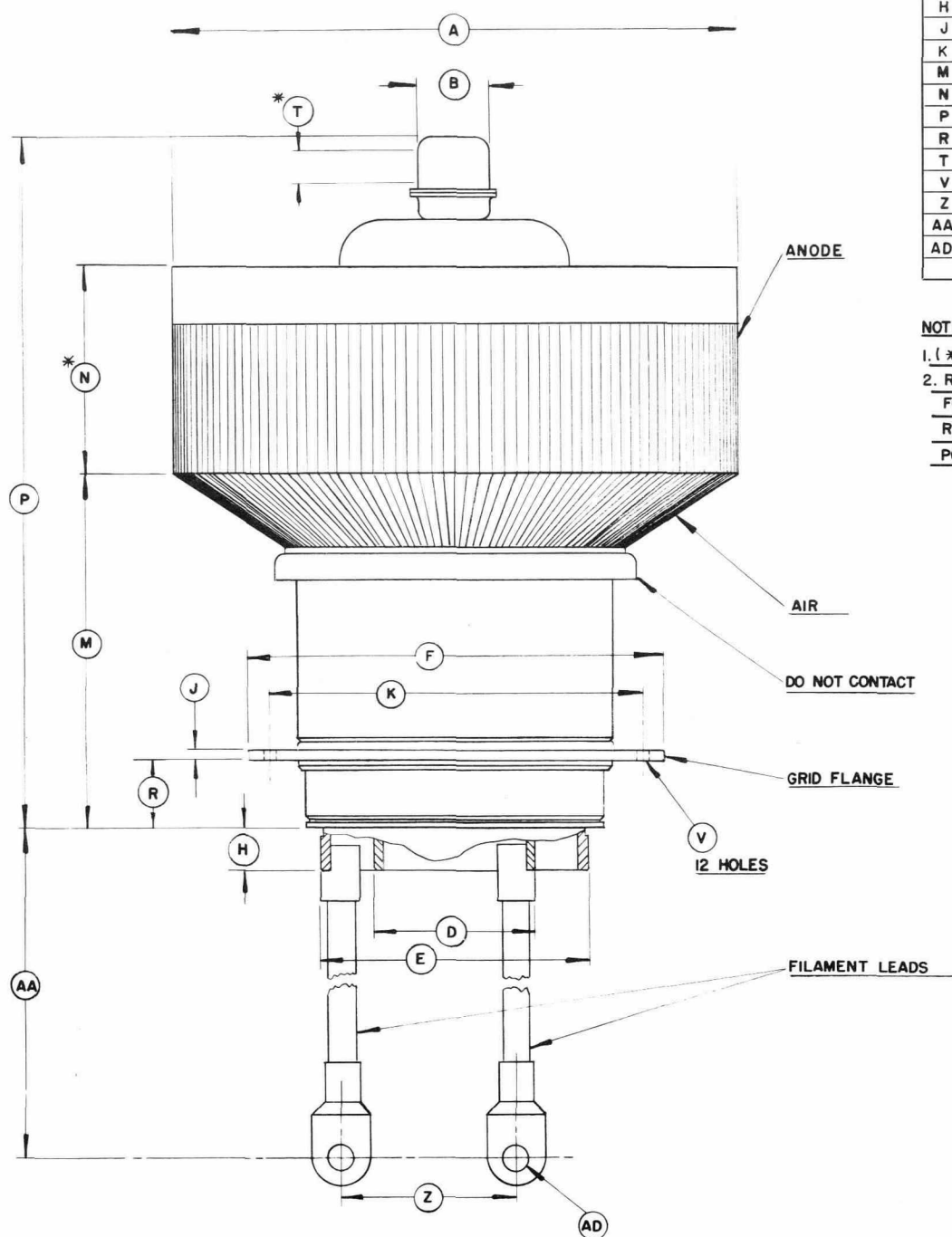
MINIMUM AIR FLOW REQUIREMENTS (Anode-to-Base Air Flow)				
Plate* Dissipation watts	Sea Level		5000 Feet	
	Air Flow CFM	Pressure Drop inches water	Air Flow CFM	Pressure Drop inches water
7500	361	1.63	433	1.96
10,000	606	3.26	728	3.92
15,000	1260	10.00	1510	12.00

*Since the power dissipated by the filament represents about 1100 watts and since grid dissipation can, under some conditions represent another 500 watts, allowance has been made in preparing this tabulation for an additional 1600 watts.

Additional stem cooling air must be provided. 16 CFM of air directed against the center filament contact ring ½" below the outer filament contact ring by a 1½" I.D. air duct arranged at a 45° angle with the center line of the tube will provide adequate cooling for maximum frequency of 30 MHz, 50°C ambient, and 5000 ft. altitude.

Special Application

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



DIMENSIONS IN INCHES			
DIMENSIONAL DATA			
DIM.	MIN.	MAX.	REF.
A	6.928	7.050	
B	.855	.895	
D			1.875
E	3.230	3.270	3.250
F	5.030	5.090	
H	.530	.700	
J			.125
K	4.425	4.445	
M	3.950	4.300	
N	2.412	2.788	
P	8.250	8.750	
R	.700	.860	
T	.375		
V			.250
Z			2.000
AA	8.500	9.000	
AD			.390

NOTES:

1. (*) CONTACT SURFACE
2. REFERENCE DIMENSIONS ARE FOR INFO. ONLY & ARE NOT REQ'D FOR INSPECTION PURPOSES.

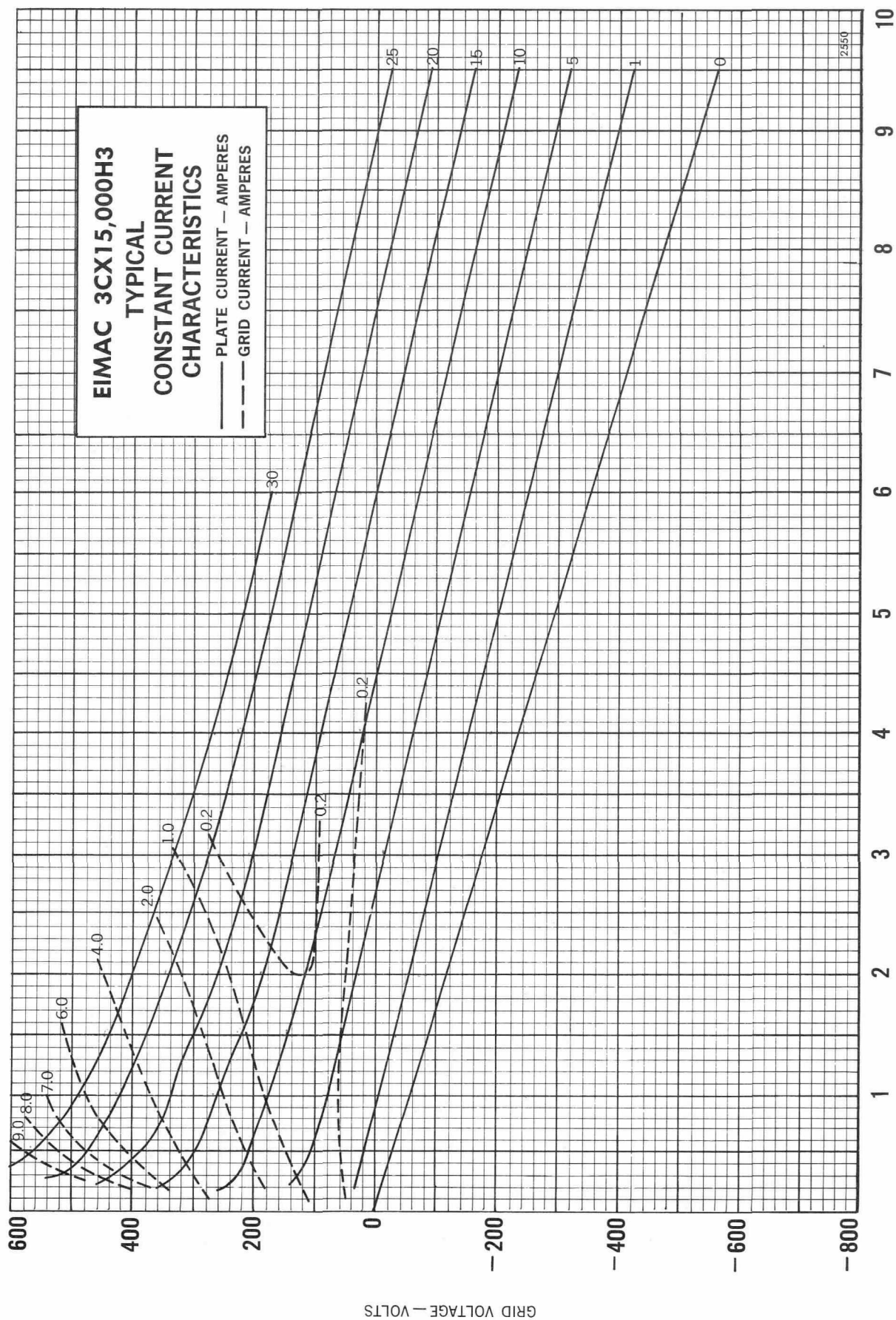


PLATE VOLTAGE — KILOVOLTS