Eimac®

EIMAC

A Division of Varian Associates

SAN CARLOS, CALIFORNIA

3CX2500H3

MEDIUM-MU AIR-COOLED POWER TRIODE

The Eimac 3CX2500H3 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 2.5 kilowatts of plate dissipation with low air flow and pressure drop.

Input of 12.5 kilowatts is permissable up to 75 megacycles. Plentiful reserve emission is available from its 390 watt filament. The grid structure is rated at 150 watts making this tube an excellent choice for severe applications.

GENERAL CHARACTERISTICS

ELECTRICAL

	Min.	Nom.	Max.	
Filament: Thoriated-Tungsten				
Voltage		7.5		Volts
Current	48		53	Amps
Amplification Factor		20		
Interelectrode Capacitances, Grounded Cathode:				
Grid-Filament	29.2		40.2	μμf
Plate-Filament	0.6		1.2	μμf
Grid-Plate	16.8		23.2	μμf
Frequency for Maximum Ratings			75	Mc

MECHANICAL

Base	See Outline
Operating Position	Vertical, base up or down
Cooling	Forced Air
Maximum Operating Temperature	250°C
Maximum Dimensions:	
Height	See Outline
Diameter	See Outline
Net Weight	6.5 Pounds

RF INDUSTRIAL OSCILLATOR

Class-C (Filtered DC Power Supply)

MAXIMUM RATINGS:

DC PLATE VOLTAGE	6000 VOLTS
DC PLATE CURRENT	2.5 AMPS
DC GRID VOLTAGE	—1000 VOLTS
DC GRID CURRENT	0.4 AMP
PLATE INPUT POWER	12.5 KW
PLATE DISSIPATION (Nominal)	2.5 KW

*Loaded Conditions

TYPICAL OPERATION*

DC Plate Voltage	4000	6000 Volts
DC Plate Current	2.5	2.08 Amps
DC Grid Voltage	—300	—500 Volts
DC Grid Current	.245	.180 Amps
Peak Positive Grid Voltage	280	265 Volts
Driving Power	142	136 Watts
Plate Input Power	10,000	12,500 kW
Plate Dissipation	2,500	2,500 kW
Plate Output Power	7,500	10,000 kW
Approximate Load Impedance	910	1,625 Ohms

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 3CX2500H3 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 0.4 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 0.275 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 — Maximum plate voltage rating of 6000 volts and maximum plate current of 2.5 amperes dc should not be applied simultaneously as rated plate dissipation may be exceeded. The 12.5 kilowatts input rating applies for Class C amplifier or oscillator service with no modulation.

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 voltages from flashing across the tube envelope during any fault conditions.

High Frequency Operation — The 3CX2500H3 is usable to 110 Mc. At this frequency, plate voltage must be reduced to 4000 volts in Class C service.

MECHANICAL

Mounting — The 3CX2500H3 must be mounted vertically either base up or down. A mounting flange is provided on the grid terminal to allow bolting the tube to a grid deck or a strap. Filament voltage is applied through two heavy flexible leads.

Cooling — Forced-air cooling must be provided to hold the ceramic-to-metal seals and anode core temperature below the maximum rating of 250°C. At ambient temperatures above 50°C, at higher altitudes and at operating temperatures above 30 mc, additional air flow must be provided. Sea level and 5000 foot altitude air-flow requirements to maintain seal temperatures below 200°C in 50°C ambient air are tabulated below (for operation below 30 mc).

Anode-to-Base Air Flow				
	Sea Level		5000 Feet	
Anode Dissipation Watts	Air Flow CFM	Pressure Drop Inches Water	Air Flow CFM	Pressure Drop Inches Water
1500	33	0.6	40	0.74
2500	66	1.25	79	1.49

Base-to-Anode Air Flow				
	Sea Level		5000 Feet	
Anode Dissipation Watts	Air Flow CFM	Pressure Drop Inches Water	Air Flow CFM	Pressure Drop Inches Water
1500	32	0.6	39	0.74
2500	57	1.0	68	1.23

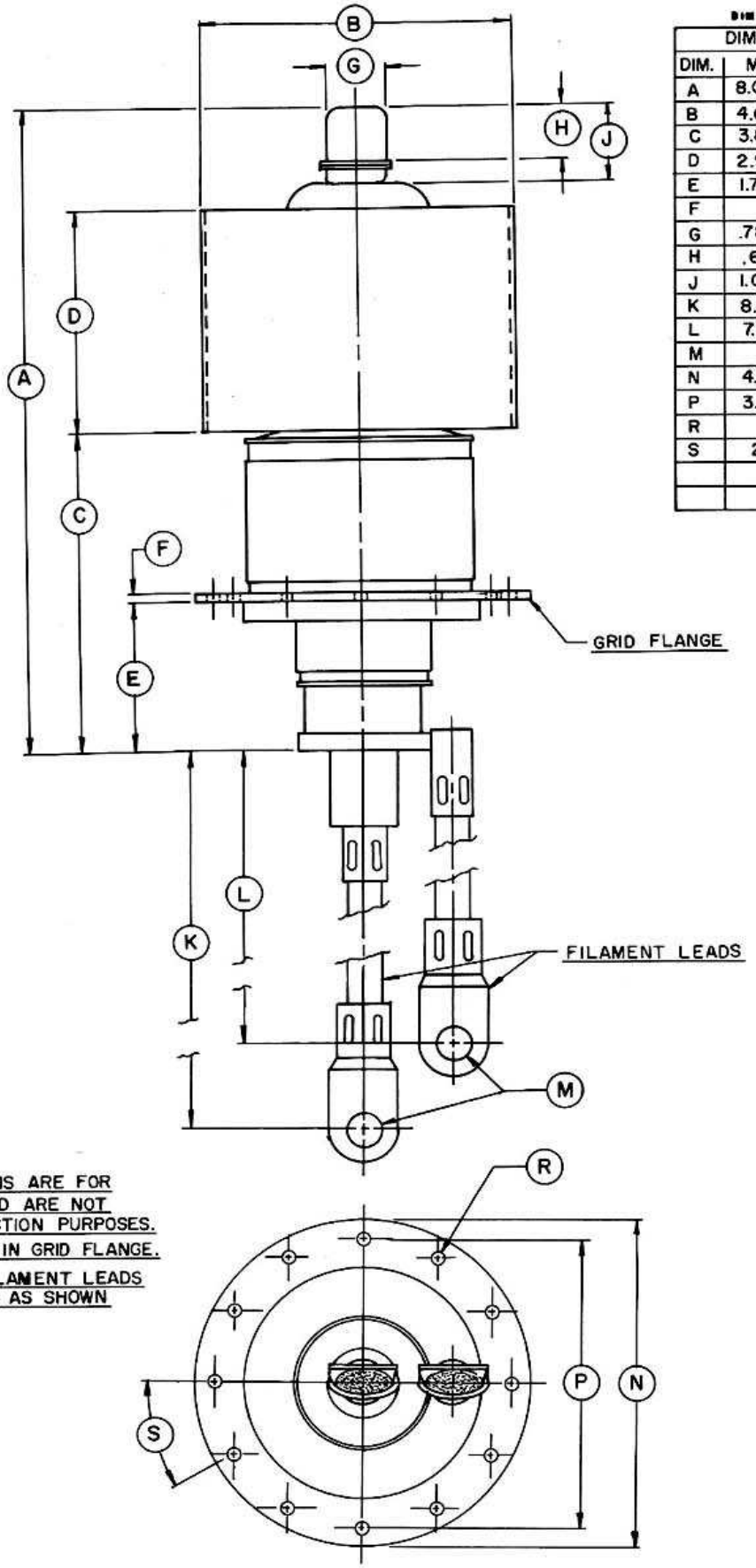
*Since the power dissipated by the filament represents about 400 watts and since grid dissipation can, under some conditions represent another 150 watts, allowance has been made in preparing this tabulation for an additional 500 watts.

Additional stem cooling air must be provided. 14 CFM of air directed against the center rod 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.

Special Application — If it is desired to operate this tube under conditions widely different from those given here, write to Power Grid Division, Eimac, 301 Industrial Way, San Carlos, Calif. for information and recommendations.

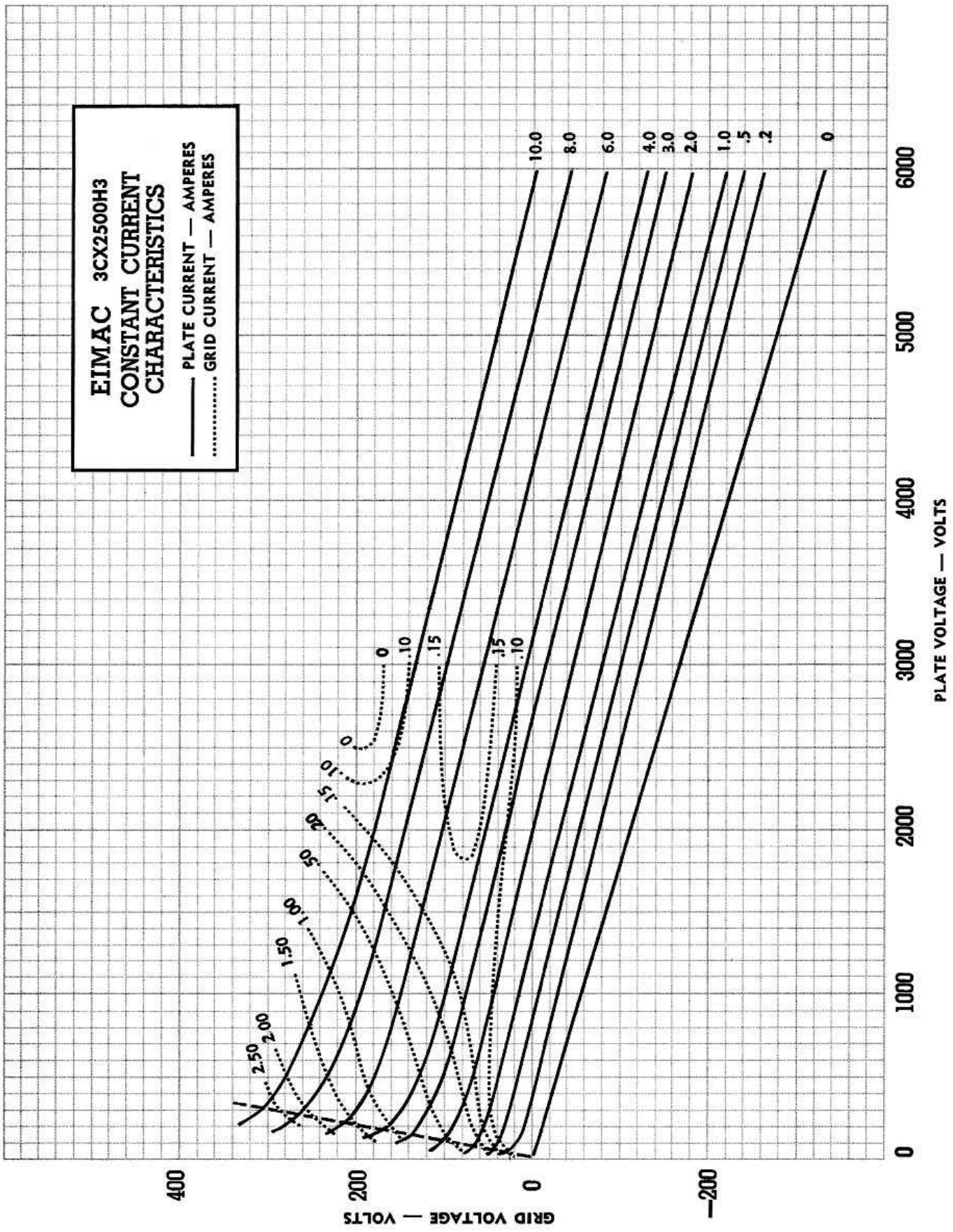
DIMENSIONS IN INCHES

DIMENSIONAL DATA			
DIM.	MIN.	MAX.	REF.
A	8.000	9.000	
B	4.093	4.156	
C	3.875	4.250	
D	2.937	3.062	
E	1.703	1.953	
F			.125
G	.781	.843	
H	.687	.812	
J	1.000	1.125	
K	8.937	9.437	
L	7.937	8.437	
M			.390
N	4.230	4.250	
P	3.855	3.885	
R			.250
S	29°	31°	



NOTES:

1. REFERENCE DIMENSIONS ARE FOR INFORMATION ONLY AND ARE NOT REQUIRED FOR INSPECTION PURPOSES.
2. THERE ARE 12 HOLES IN GRID FLANGE.
3. GRID FLANGE AND FILAMENT LEADS ARE TO BE ORIENTED AS SHOWN


EIMAC 3CX2500H3
CONSTANT CURRENT
CHARACTERISTICS
PLATE CURRENT — AMPERES
GRID CURRENT — AMPERES
10.0
8.0
6.0
4.0
3.0
2.0
1.0
.5
.2
0
2.50
2.00
1.50
1.00
.50
.20
.15
.10
0
.15
.10
0
400
200
0
—200
GRID VOLTAGE — VOLTS
0
1000
2000
3000
4000
5000
6000
PLATE VOLTAGE — VOLTS