



**EITEL-McCULLOUGH, INC.**  
SAN CARLOS · CALIFORNIA

**7580**

**RADIAL-BEAM  
POWER TETRODE**

The 7580 is a compact, high-perveance, radial-beam tetrode designed specially for maximum power output as a class-AB<sub>1</sub> linear amplifier. It is capable of 470 watts peak envelope power output under two-tone conditions. A pair of 7580 tubes will provide audio or ultrasonic power of 595 watts operating in amplifier or modulator service, class-AB<sub>1</sub>, with a transformer efficiency of 95%.

The upper frequency for use of the 7580 at maximum ratings is 500 megacycles.

**GENERAL CHARACTERISTICS**

**ELECTRICAL**

	Min.	Nom.	Max.	
Cathode: Oxide-Coated, Unipotential				
Heating Time	30	60		seconds
Cathode-to-Heater Potential	—		±150	volts
Heater: Voltage		6.0		volts
Current	2.3		2.9	amperes
Direct Interelectrode Capacitances, Grounded Cathode:				
Input	16.0		18.5	uuf
Output	4.0		5.0	uuf
Grid-to-Plate			0.06	uuf



**MECHANICAL**

Base	Special 9-pin
Maximum Operating Temperatures:	
Ceramic-to-Metal Seals	250°C
Anode Core	250°C
Recommended Socket	Eimac SK-600 Series
Operating Position	Any
Maximum Dimensions:	
Height	2.464 inches
Seated Height	1.910 inches
Diameter	1.640 inches
Cooling	Forced Air
Net Weight	4 ounces
Shipping Weight (Approximate)	1.6 pounds

**RADIO-FREQUENCY LINEAR AMPLIFIER**

Class-AB<sub>1</sub> - Single Sideband

**MAXIMUM RATINGS**

D-C PLATE VOLTAGE	2000 MAX. VOLTS
D-C SCREEN VOLTAGE	500 MAX. VOLTS
D-C GRID VOLTAGE	—250 MAX. VOLTS
D-C PLATE CURRENT	.250 MAX. AMP
PLATE DISSIPATION	250 MAX. WATTS
SCREEN DISSIPATION	12 MAX. WATTS

**TYPICAL OPERATION**

Two-Tone where peak envelope power is at least twice the average power output—Actual measurements—Tank circuit efficiency estimated at 95%.

D-C Plate Voltage	1500	2000	volts
Zero-Signal D-C Plate Current	.133	.070	amp
Two-Tone D-C Plate Current	.250	.245	amp
D-C Screen Voltage	350	400	volts
Two-Tone D-C Screen Current	—10	+1	ma
D-C Grid-Bias Voltage	—62	—80	volts
Peak Signal Voltage	56	80	volts
3rd Order Intermodulation products referred to signal level	—30	—23	db
5th Order Intermodulation products referred to signal level	—35	—27	db
Worst 3rd Order Intermodulation as drive signal is reduced	—29	—21	db
Load Resistance	2160	2840	ohms
Peak Envelope Power	262	470	watts

**RADIO-FREQUENCY LINEAR AMPLIFIER**Class-AB<sub>1</sub> (Carrier with Double Sidebands)**MAXIMUM RATINGS**

D-C PLATE VOLTAGE	-	-	-	2000	MAX. VOLTS
D-C SCREEN VOLTAGE	-	-	-	500	MAX. VOLTS
D-C GRID VOLTAGE	-	-	-	-250	MAX. VOLTS
D-C PLATE CURRENT	-	-	-	.250	MAX. AMP
PLATE DISSIPATION	-	-	-	250	MAX. WATTS
SCREEN DISSIPATION	-	-	-	12	MAX. WATTS

**TYPICAL OPERATION—Single Tube**

(Quantities shown for carrier conditions, no modulation)

D-C Plate Voltage	-	-	-	-	1500	2000	volts
D-C Plate Current	-	-	-	-	.172	.172	amp
D-C Screen Voltage	-	-	-	-	350	400	volts
D-C Screen Current (Approx)	-	-	-	-	-3	-5	ma
D-C Grid-Bias Voltage	-	-	-	-	-58	-76	volts
Peak Grid-Signal Voltage	-	-	-	-	30	39	volts
Plate-Load Resistance	-	-	-	-	2320	3150	ohms
Power Output for Tank Circuit							
Efficiency of 95%	-	-	-	-	55	100	watts

**AUDIO-FREQUENCY LINEAR AMPLIFIER**Class-AB<sub>1</sub>**MAXIMUM RATINGS (Per Tube)**

D-C PLATE VOLTAGE	-	-	-	2000	MAX. VOLTS
D-C SCREEN VOLTAGE	-	-	-	500	MAX. VOLTS
D-C GRID VOLTAGE	-	-	-	-250	MAX. VOLTS
D-C PLATE CURRENT	-	-	-	.250	MAX. AMP
PLATE DISSIPATION	-	-	-	250	MAX. WATTS
SCREEN DISSIPATION	-	-	-	12	MAX. WATTS

**TYPICAL OPERATION (Two Tubes Push-Pull)**

D-C Plate Voltage	-	-	-	-	1500	2000	volts
D-C Plate Current No Signal	-	-	-	-	.200	.140	amp
D-C Plate Current at Full Signal	-	-	-	-	.490	.500	amp
D-C Screen Voltage	-	-	-	-	300	350	volts
D-C Screen Current No Signal	-	-	-	-	-2	-4	ma
D-C Screen Current at Full Signal	-	-	-	-	0	+4	ma
D-C Grid-Bias Voltage (Approx)	-	-	-	-	-48	-66	volts
Plate-to-Plate Load Resistance	-	-	-	-	5920	8016	ohms
Power Output for Transformer							
Efficiency of 95%	-	-	-	-	390	595	watts

**MAXIMUM RATINGS FOR OTHER TYPES OF OPERATION**

Class-C Telegraphy or FM

D-C PLATE VOLTAGE	-	-	-	2000	MAX. VOLTS
D-C SCREEN VOLTAGE	-	-	-	300	MAX. VOLTS
D-C GRID VOLTAGE	-	-	-	-250	MAX. VOLTS
D-C PLATE CURRENT	-	-	-	.250	MAX. AMP
PLATE DISSIPATION	-	-	-	250	MAX. WATTS
SCREEN DISSIPATION	-	-	-	12	MAX. WATTS
GRID DISSIPATION	-	-	-	2	MAX. WATTS

Class-C Plate Modulated

D-C PLATE VOLTAGE	-	-	-	1500	MAX. VOLTS
D-C SCREEN VOLTAGE	-	-	-	300	MAX. VOLTS
D-C GRID VOLTAGE	-	-	-	-250	MAX. VOLTS
D-C PLATE CURRENT	-	-	-	.200	MAX. AMP
PLATE DISSIPATION	-	-	-	165	MAX. WATTS
SCREEN DISSIPATION	-	-	-	12	MAX. WATTS
GRID DISSIPATION	-	-	-	2	MAX. WATTS

# APPLICATION

**MECHANICAL**

**Mounting**—The 7580 may be mounted in any position. An Eimac Air-System Socket of the SK-600 series or equivalent is recommended. These sockets may be obtained with or without the r-f screen by-pass capacitor, and with or without the four cathode terminals grounded to the socket shell. A simple Lock-in socket restricts the flow of cooling air and is not recommended.

**Cooling**—The 7580 has an efficient louvered anode cooler. The maximum allowable temperature for any external surface is 250°C.

For long service life at sea level, at an ambient temperature of 25°C and maximum rated anode dissipation of 250 watts, a *minimum* of 4.6 cfm air should flow from tube base through the anode cooler. The corresponding pressure drop with the recommended socket and chimney will be approximately .32 inch water column. See table for other dissipation levels and conditions.

4.6 cfm of air at 25°C is the same as a mass air flow of 18 pounds per hour. Higher ambient temperature requires greater air mass and volume. Higher

altitude requires equivalent mass air flow for a given ambient temperature and therefore requires greater volume at increased back pressure.

The use of temperature-sensitive laquer is recommended to determine the effectiveness of a cooling system under operating conditions.

Plate Dissipation (Watts)	55°C AMBIENT			
	SEA LEVEL		10,000 FEET ALTITUDE	
	Air Flow (CFM)	Pressure Drop (Inches of Water)	Air Flow (CFM)	Pressure Drop (Inches of Water)
75	1.15	.025	1.8	.036
125	2.3	.09	3.35	.13
250	6.4	.59	9.3	.86

**Vibration and Shock**—The 7580 is designed to withstand low-frequency vibration of 25 cps, 0.80 inch total excursion as outlined in MIL-E-1D, no voltage. It will withstand a bump test as described in MIL-E-1D for a hammer angle of 20°.

## ELECTRICAL

**Heater**—For maximum life and uniform performance, the heater voltage should be maintained within plus or minus 5% of the rated 6.0 volts at operating frequencies up to 300 Mc. For CW use between 300 and 400 Mc, 5.75 volts is recommended. For CW use, 400 to 500 Mc, 5.5 volts is recommended.

**Cathode**—The cathode is connected to the four even-numbered base pins to provide a low-inductance path, or permit separation of input and output circuits if required.

Rated heater voltage should be applied for 30 seconds before other operating voltages are applied.

Heater-to-cathode maximum voltage is  $\pm 150$  volts.

**Control Grid**—Maximum rated d-c bias voltage is -250 volts. D-C resistance, grid to cathode, should be no more than 100,000 ohms.

**Screen Grid**—Screen dissipation maximum is 12 watts, normally computed by multiplying d-c screen voltage by the average screen current. This computation is essentially correct except in the case of heavy plate loading when secondary-emission current may mask the normal screen current.

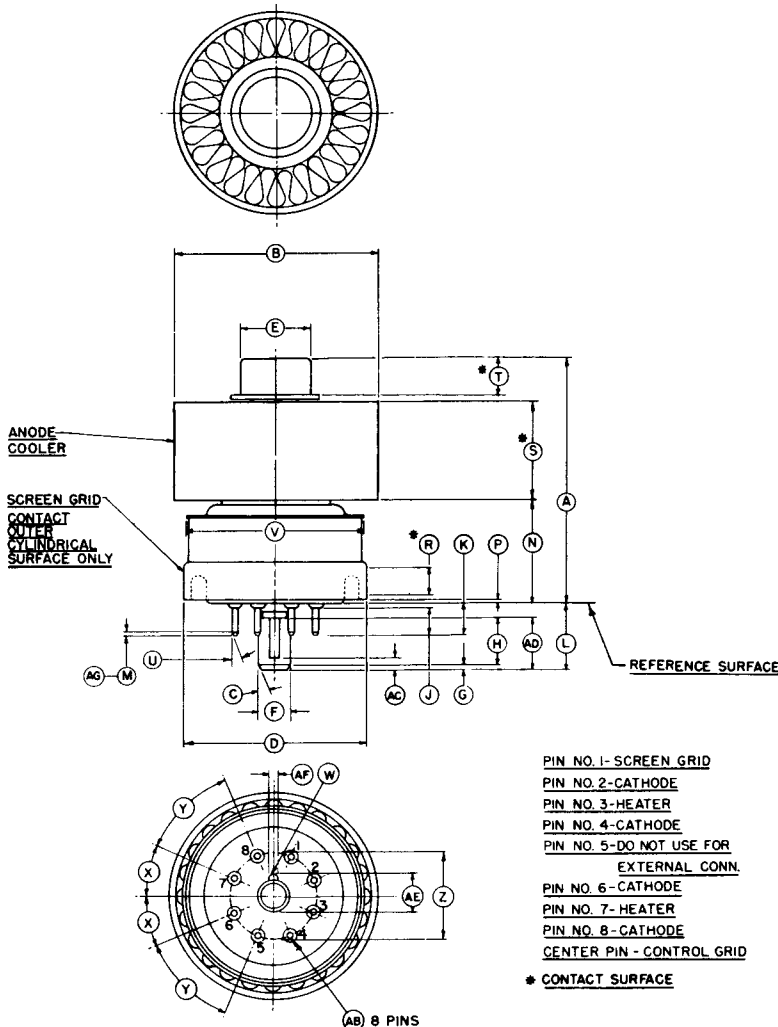
All tetrodes, under some conditions of loading and drive, will have secondary emission from the screen

which changes the net current to the screen and may even cause the screen meter to reverse. Normally, secondary emission is harmless provided the screen voltage is stable. To insure stable screen voltage, it is recommended that a bleeder resistor to pass 15 ma from screen to ground be used.

**Plate Dissipation**—The maximum plate dissipation is 250 watts. The usual single-sideband voice signal is complex and full peak envelope power shown in Typical Operating Conditions, may be developed without exceeding this plate dissipation. Single-tone testing for short periods with greater than 250 watts plate dissipation is permissible.

**Multiple Operation** — To obtain maximum power with minimum distortion from tubes operated in multiple it is desirable to adjust individual screen or grid-bias voltages so the peak plate current for each tube is equal at the crest of the exciting voltage. Under these conditions, individual d-c plate currents will be approximately equal for full input signal for class-AB<sub>1</sub> operation.

**Special Application**—If it is desired to use the 7580 under conditions widely different from those given here, consult the Power Grid Tube Marketing Department, Eitel-McCullough, Inc., San Carlos, California, or any of our regional offices or representatives.



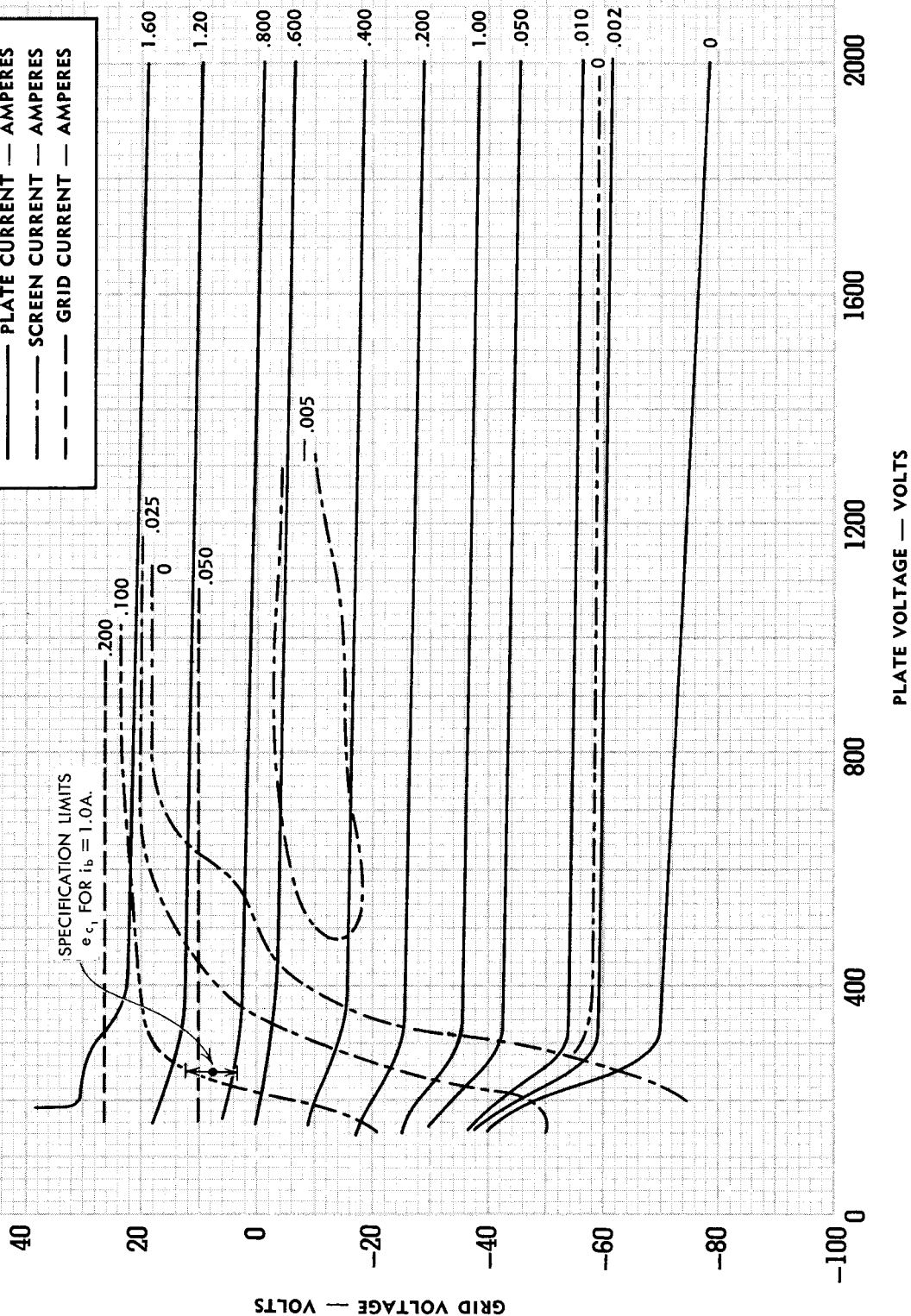
DIMENSIONS IN INCHES		
REF.	MIN.	MAX.
A	1.810	1.910
B	1.610 DIA.	1.640 DIA.
C	30°	
D	1.417 DIA.	1.433 DIA.
E	.559 DIA.	.573 DIA.
F	.255 DIA.	.265 DIA.
G	.031	
H	.360	
J	.187	
K	.250	
L	.514	.554
M	.035	
N	.750	.810
P	.020	
R	.187	
S	.710	.790
T	.240	.280
U	22 1/2°	
V	1.406 DIA.	
W	.043 R.	
X	22 1/2°	
Y	45°	
Z	.680 DIA. P.C.	.694 DIA. P.C.
AB	.045 DIA.	.053 DIA.
AC	.068	.108
AD	.456	
AE	.298	.308
AF	.078	.086
AG	.005 R. MIN. (ALTERNATE TO MBU)	

# EIMAC 7580

## TYPICAL CONSTANT CURRENT CHARACTERISTICS

SCREEN VOLTAGE — 250 VOLTS

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

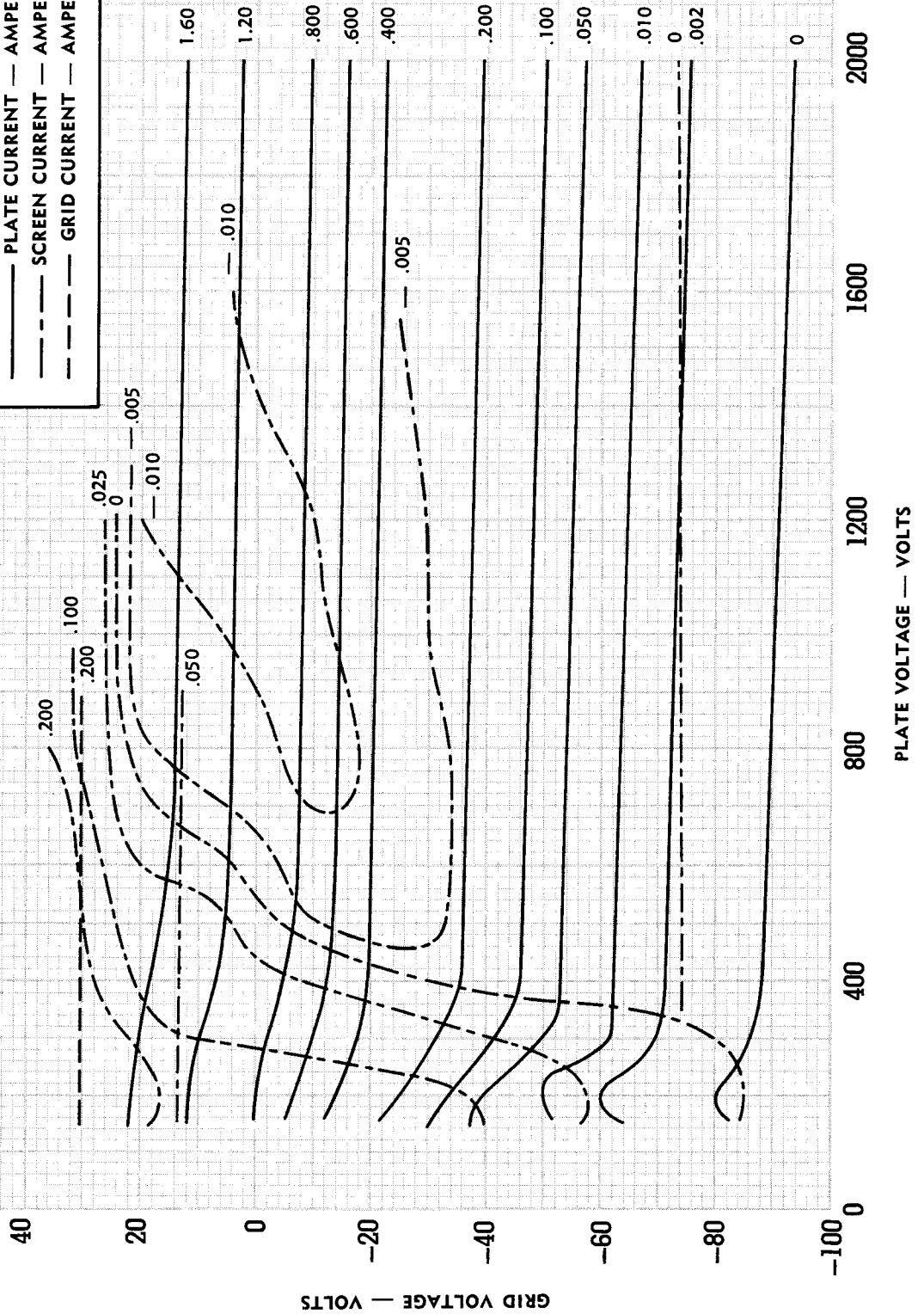


# EIMAC 7580

## TYPICAL CONSTANT-CURRENT CHARACTERISTICS

SCREEN VOLTAGE — 300 VOLTS

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





**EIMAC 7580**  
**TYPICAL CONSTANT CURRENT**  
**CHARACTERISTICS**  
SCREEN VOLTAGE — 400 VOLTS  
— PLATE CURRENT — AMPERES  
— SCREEN CURRENT — AMPERES  
— GRID CURRENT — AMPERES

