



E I M A C
 Division of Varian
 S A N C A R L O S
 C A L I F O R N I A

8158
3CX10,000A1

LOW-MU
POWER TRIODE

The Eimac 8158/3CX10,000A1 is a ceramic and metal power triode intended primarily for use as an audio amplifier or modulator. This tube is also recommended for voltage-regulator applications where high current capability and low tube drop are important. Up to 12 kilowatts of plate power can be dissipated on its air-cooled anode. A water-cooled version, the 3CW20,000A1, is available with a 20 kw dissipation rating.



CHARACTERISTICS

ELECTRICAL

| | | | |
|---|--------|------|--------|
| Filament: Thoriated-Tungsten | Min. | Nom. | Max. |
| Voltage | | 7.5 | V |
| Current | 94 | | 104 A |
| Amplification Factor | 5.5 | | 7.0 |
| Interelectrode Capacitances: | | | |
| Grid-Filament | 45 | | 57 pF |
| Output | 3.4 | | 4.2 pF |
| Grid-Plate | 25 | | 32 |
| Transconductance (Ib = 2.0 amps, Eb = 3000 volts) | 20,000 | | umhos |

MECHANICAL

| | |
|----------------------------------|---------------------------|
| Base | Coaxial |
| Recommended Socket | Eimac SK-1300 |
| Recommended Chimney | Eimac SK-1306 |
| Operating Position | Vertical, base up or down |
| Cooling | Forced air |
| Maximum Operating Temperatures: | |
| Anode Core | 250 °C |
| Ceramic-to-Metal Seals | 250 °C |
| Maximum Dimensions: | |
| Height | 8.75 in |
| Diameter | 7.0 in |
| Net Weight | 12 lbs |

**AUDIO-FREQUENCY
 AMPLIFIER OR MODULATOR
 CLASS-AB₁**

**TYPICAL OPERATION, Two Tubes,
 Sinusoidal Wave**

MAXIMUM RATINGS (Per Tube)

| | | |
|-----------------------------|------|-------|
| DC Plate Voltage | 7000 | volts |
| DC Plate Current | 5.0 | amps |
| Plate Dissipation | 12 | kW |
| Grid Dissipation | 100 | watts |

| | | | |
|--|--------|--------|---------|
| DC Plate Voltage | 7000 | 7000 | volts |
| DC Grid Voltage* | -1300 | -1300 | volts |
| Zero-Sig DC Plate Current | 1.5 | 1.5 | amps |
| Max-Sig DC Plate Current | 5.8 | 7.0 | amps |
| Load Resistance, | | | |
| Plate-to-Plate | 2460 | 1720 | ohms |
| Peak AF Grid Driving Voltage (Per Tube) | 1300 | 1300 | volts |
| Max-Sig Driving Power | 0 | 0 | watts |
| Max-Sig Plate Output Power | 24,400 | 29,100 | watts |
| Total Harmonic Distortion** | 2.9 | 3.6 | percent |

*Adjust for zero-signal plate current
 **At max-signal without negative feedback

Effective grid circuit resistance must not exceed
 200,000 ohms



AUDIO-FREQUENCY AMPLIFIER OR MODULATOR Class-A

TYPICAL OPERATION

MAXIMUM RATINGS

| | |
|-----------------------------|--------------------------------------|
| DC Plate Voltage | 7000 volts |
| DC Plate Current | See Class-A derating table on Page 3 |
| Plate Dissipation | 12,000 watts |

| | |
|--|------------|
| DC Plate Voltage | 2500 volts |
| DC Grid Voltage* | -290 volts |
| DC Plate Current | 4.0 amps |
| Peak AF Grid Driving Voltage | 290 volts |
| Load Resistance | 2120 ohms |
| Plate Output Power | 1800 watts |

*Adjust to give listed zero-signal DC plate current

VOLTAGE REGULATOR SERVICE Class-A

TYPICAL OPERATION

MAXIMUM RATINGS

| | |
|-----------------------------|--------------------------------------|
| DC Plate Voltage | 10,000 volts |
| DC Plate Current | See Class-A derating table on Page 3 |
| Plate Dissipation | 12,000 watts |
| Grid Dissipation | 100 watts |

| | |
|--|--------------|
| DC Plate Voltage (tube drop) | 0-5000 volts |
| DC Plate Current | 0-5 amps |

(These values are chosen according to Class-A derating table on Page 3)

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

APPLICATION

Cooling — The maximum temperature rating for the external surfaces of the 3CX10, 000A1 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. The use of these air-flow rates through the recommended socket/chimney and tube combination in the base-to-anode direction provides effective cooling of the tube.

| Plate** Dissipation (Watts) | SEA LEVEL | | 10,000 FEET | |
|-----------------------------------|-------------------|------------------------------------|-------------------|------------------------------------|
| | Air Flow (CFM) | Pressure Drop (Inches of Water) | Air Flow (CFM) | Pressure Drop (Inches of Water) |
| 4000 | 85 | 0.18 | 125 | 0.25 |
| 6000 | 145 | 0.38 | 210 | 0.55 |
| 8000 | 215 | 0.68 | 315 | 0.99 |
| 10,000 | 295 | 1.08 | 430 | 1.60 |
| 12,000 | 390 | 1.62 | 565 | 2.35 |

**Since the power dissipated by the filament is about 750 watts and since grid dissipation can, under some circumstances, represent another 100 watts, allowance has been made in preparing this tabulation for an additional 850 watts dissipation.



APPLICATION

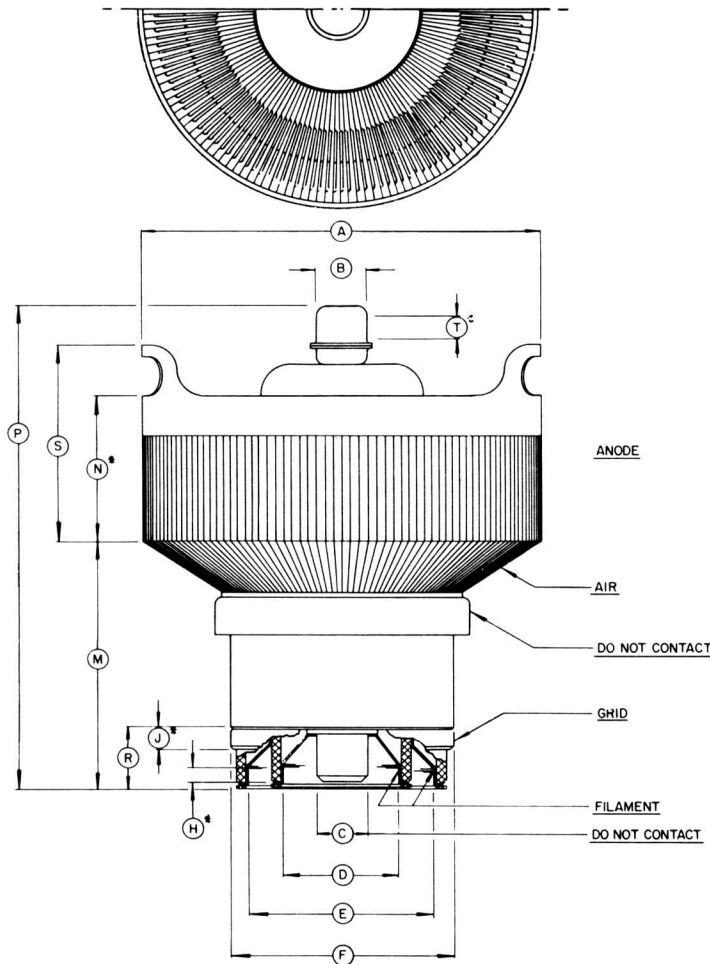
Voltage-Regulator Service — Maximum DC plate current and voltage are restricted according to the following table.

| CLASS-A DERATING TABLE | |
|--------------------------|----------------------------|
| DC Plate Voltage (Volts) | Max. DC Plate Current (mA) |
| 0 - 2400 | 5000 |
| 3000 | 4000 |
| 4000 | 3000 |
| 5000 | 2000 |
| 6000 | 1500 |
| 7000 | 1000 |
| 8000 | 700 |
| 9000 | 500 |
| 10,000 | 350 |

Filament Operation—The rated filament voltage for the 3CX10,000A1 is 7.5 volts. Filament voltage, as measured at the socket, should not be allowed to deviate from the rated value by more than plus or minus five percent.

Cooling—The maximum temperature rating for the external surfaces of the 3CX10,000A1 is 250°C. Sufficient forced-air cooling must be provided to maintain the temperature of the ceramic-metal seals and anode core 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. The use of these air-flow rates provides effective cooling of the tube. When air-flow is in the anode-to-base direction, special care must be taken to insure adequate cooling of the filament stem structure. A separate supply of air may have to be directed into the area between the filament contact areas to maintain safe seal temperatures.

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



| DIMENSION DATA | | | |
|----------------|------|-------|-------|
| REF. | NOM. | MIN. | MAX. |
| A | | 6.928 | 7.050 |
| B | | .855 | .895 |
| C | | .720 | .760 |
| D | | 1.896 | 1.936 |
| E | | 3.133 | 3.173 |
| F | | 3.792 | 3.832 |
| H | | .188 | |
| J | | .188 | |
| M | | 3.950 | 4.300 |
| N | | 2.412 | 2.788 |
| P | | 8.250 | 8.750 |
| R | | .986 | 1.050 |
| S | | 3.412 | 3.788 |
| T | | .375 | |

* CONTACT SURFACE
ALL DIMENSIONS IN INCHES



3CX10,000A1

