**CHARACTERISTICS**

**GENERAL DATA**
- Focusing Method: Electrostatic
- Deflection Method: Magnetic
- Deflection Angles (Approx.)
  - Horizontal: 102 Degrees
  - Diagonal: 114 Degrees
  - Vertical: 86 Degrees
- Phosphor: Aluminized P4
- Fluorescence: White
- Persistence: Short to Medium
- Faceplate: Bonded Shield
  (Gray Filter Glass Safety Plate Laminated Directly to Face of Tube)
- Light Transmittance of Faceplate Assembly (Approx.): 44 Percent
  Types 19AUP4 and 19BCP4 have external surface of safety plate treated to reduce specular reflection.

**ELECTRICAL DATA**

<table>
<thead>
<tr>
<th>19BAP4</th>
<th>19AFP4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Voltage</td>
<td>6.5</td>
</tr>
<tr>
<td>Heater Current ± 5%</td>
<td>0.30</td>
</tr>
<tr>
<td>Heater Warm-up Time</td>
<td>11 Seconds</td>
</tr>
</tbody>
</table>
| Direct Inter-electrode Capacitances (Approx.)
  - Cathode to All Other Electrodes: 5 μf |
  - Grid No.1 to All Other Electrodes: 6 μf |
  - External Conductive Coating to Anode: 1500 μf Max, 1000 μf Min.

**MECHANICAL DATA**
- Minimum Useful Screen Dimensions (Maximum Assured)
  - Height: 12\(\frac{1}{2}\) Inches
  - Width: 15\(\frac{1}{4}\) Inches
  - Diagonal: 17\(\frac{3}{4}\) Inches
  - Area: 174 Sq. Inches
- Neck Length: 4\(\frac{1}{2}\) ± 3\(\frac{1}{2}\) Inches
- Overall Length: 11\(\frac{1}{2}\) ± 5\(\frac{1}{2}\) Inches
- Bulb: J149C
- Safety Plate (19AFP4, 19BAP4): FP159A
- Safety Plate (19AUP4, 19BCP4): FP159B
- Bulb Contact (Recessed Small Cavity Cap): J1-21
- Base: B7-208
- Basing: 8HR
- Weight (Approx.): 18\(\frac{1}{2}\) Pounds

**RATINGS**

**MAXIMUM RATINGS (Design Maximum Values)**
- Grid Drive Service
  - Anode Voltage: 20,000 Volts dc
  - Grid No. 4 Voltage (Focusing Electrode): -550 to +1100 Volts dc
  - Grid No. 2 Voltage: 550 Volts dc
  - Grid No. 1 Voltage
    - Negative Bias Voltage: 155 Volts dc
    - Negative Peak Value: 220 Volts
    - Positive Bias Value: 0 Volts dc
    - Positive Peak Value: 2 Volts
- Peak Heater-Cathode Voltage
  - Heater Negative with Respect to Cathode During Warm-up Period not to Exceed 15 Seconds: 450 Volts
  - After Equipment Warm-up Period: 200 Volts
  - Heater Positive with Respect to Cathode: 200 Volts
MAXIMUM RATINGS (Design Maximum Values) Con’t.

Cathode Drive Service\(^4\)
- Anode Voltage .................................................. 20,000 Volts dc
- Grid No. 4 Voltage (Focusing Electrode) .................. -400 to +1250 Volts dc
- Grid No. 2 Voltage ............................................. 700 Volts dc

Cathode Voltage
- Positive Bias Value ........................................... 155 Volts dc
- Positive Peak Value ........................................... 220 Volts dc
- Negative Bias Value ........................................... 0 Volts dc
- Negative Peak Value ......................................... 2 Volts

Peak Heater-Cathode Voltage
- Heater Negative with Respect to Cathode
  During Warm-up Period not to Exceed 15 Seconds ....... 450 Volts
  After Equipment Warm-up Period ......................... 200 Volts
- Heater Positive with Respect to Cathode ............... 200 Volts

TYPICAL OPERATING CONDITIONS

Grid Drive Service\(^3\)
- Anode Voltage .................................................. 16,000 Volts dc
- Grid No. 4 Voltage for Focus ............................... 0 to 400 Volts dc
- Grid No. 2 Voltage ............................................. 400 Volts dc
- Grid No. 1 Voltage Required for Cutoff\(^5\) ............. -46 to -94 Volts dc

Cathode Drive Service\(^4\)
- Anode Voltage .................................................. 16,000 Volts dc
- Grid No. 4 Voltage for Focus ............................... 0 to 400 Volts dc
- Grid No. 2 Voltage ............................................. 400 Volts dc
- Cathode Voltage Required for Cutoff\(^5\) .................. 42 to 78 Volts dc

CIRCUIT VALUES
- Grid No. 1 Circuit Resistance .............................. 1.5 Megohms Max.

NOTES:
1. Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of the rated heater voltage after applying four (4) times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three (3) times the rated heater voltage divided by the rated heater current.
2. External conductive coating must be grounded.
3. Voltages are positive with respect to cathode unless indicated otherwise.
4. Voltages are positive with respect to Grid No. 1 unless indicated otherwise.
5. Visual extinction of focused raster. For cutoff of the undeflected focused spot, the absolute value of the bias between cathode and grid will increase by about 5 volts.

WARNING:
X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at higher than the manufacturer’s Maximum Rated Anode Voltage or 16,000 volts, whichever is less.
OUTLINE

DIAGRAM NOTES:

1. Reference line is determined by plane C-C' of JEDEC No. 126 Reference Line Gauge, when the gauge is seated against the bulb.

2. Base Pin No. 4 aligns with horizontal centerline (A-A') within 30° and is on same side as anode contact, J1-21.

3. Planes perpendicular to tube axis and passing through points X, Y and Z are located as follows:
   Plane tangent to crown of face to plane of X: 0.500" Nominal
   Plane of X to plane of Y = .421" ± .025"
   Plane of X to plane of Z = .738" ± .045"

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