

## 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

|                                                             | 19BAP4<br>19BCP4 | 19AFP4<br>19AUP4                                         |
|-------------------------------------------------------------|------------------|----------------------------------------------------------|
| Heater Voltage . . . . .                                    | 6.3              | 6.3 Volts                                                |
| Heater Current $\pm 5\%$ . . . . .                          | 0.30             | 0.60 Ampere                                              |
| Heater Warm-up Time <sup>1</sup> . . . . .                  | 11               | 11 Seconds                                               |
| Direct Interelectrode Capacitances (Approx.)                |                  |                                                          |
| Cathode to All Other Electrodes . . . . .                   |                  | 5 $\mu\mu\text{f}$                                       |
| Grid No 1 to All Other Electrodes . . . . .                 |                  | 6 $\mu\mu\text{f}$                                       |
| External Conductive Coating to Anode <sup>2</sup> . . . . . |                  | 1500 $\mu\mu\text{f}$ Max.<br>1000 $\mu\mu\text{f}$ Min. |

### MECHANICAL DATA

|                                                    |                                          |
|----------------------------------------------------|------------------------------------------|
| Minimum Useful Screen Dimensions (Maximum Assured) |                                          |
| Height . . . . .                                   | 12 $\frac{1}{16}$ Inches                 |
| Width . . . . .                                    | 15 $\frac{1}{4}$ Inches                  |
| Diagonal . . . . .                                 | 17 $\frac{3}{4}$ Inches                  |
| Area . . . . .                                     | 174 Sq. Inches                           |
| Neck Length . . . . .                              | 4 $\frac{1}{8} \pm \frac{1}{8}$ Inches   |
| Overall Length . . . . .                           | 11 $\frac{5}{8} \pm \frac{5}{16}$ 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                  |

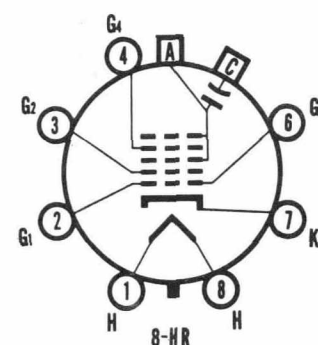
## RATINGS

### MAXIMUM RATINGS (Design Maximum Values)

|                                                          |                     |    |
|----------------------------------------------------------|---------------------|----|
| Grid Drive Service <sup>3</sup>                          |                     |    |
| 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           |    |

## QUICK REFERENCE DATA

Television Picture Tube  
19" Direct Viewed  
Rectangular Glass Type  
Spherical Faceplate  
Bonded Shield  
Gray Filter Glass  
Aluminized Screen  
Electrostatic Focus  
114° Magnetic Deflection  
No Ion Trap  
External Conductive Coating



## SYLVANIA ELECTRONIC TUBES

A Division of  
Sylvania Electric Products Inc.

### PICTURE TUBE OPERATIONS SENECA FALLS, NEW YORK

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File Under  
TELEVISION PICTURE TUBES

## MAXIMUM RATINGS (Design Maximum Values) Con't.

|                                                          |                     |    |
|----------------------------------------------------------|---------------------|----|
| <b>Cathode Drive Service<sup>4</sup></b>                 |                     |    |
| Anode Voltage . . . . .                                  | 20,000 Volts        | dc |
| Grid No. 4 Voltage (Focusing Electrode) . . . . .        | -400 to +1250 Volts | dc |
| Grid No. 2 Voltage . . . . .                             | 700 Volts           | dc |
| <b>Cathode Voltage</b>                                   |                     |    |
| Positive Bias Value . . . . .                            | 155 Volts           | dc |
| Positive Peak Value . . . . .                            | 220 Volts           |    |
| Negative Bias Value . . . . .                            | 0 Volts             | dc |
| Negative Peak Value . . . . .                            | 2 Volts             |    |
| <b>Peak Heater-Cathode Voltage</b>                       |                     |    |
| 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

|                                                               |                  |    |
|---------------------------------------------------------------|------------------|----|
| <b>Grid Drive Service<sup>3</sup></b>                         |                  |    |
| 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 <sup>5</sup> . . . . . | -46 to -94 Volts | dc |
| <b>Cathode Drive Service<sup>4</sup></b>                      |                  |    |
| 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 <sup>5</sup> . . . . .    | 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.

Technical drawing of a shield assembly, showing front, side, and bottom views with dimensions and labels.

**Front View (Top Left):**

- Overall width:  $19 \frac{55}{64} \pm \frac{3}{32}$
- Overall height:  $14 \frac{3}{32} \pm \frac{3}{32}$
- Useful screen area width:  $15 \frac{5}{16}$  MIN.
- Mounting tabs:  $1 \frac{1}{4}$ ,  $1 \frac{1}{2}$
- Internal dimensions:  $7 \frac{1}{8} R$ ,  $30 \frac{1}{16} R$ ,  $15 \frac{3}{8} R$ ,  $2 \frac{9}{16}$ ,  $48 \frac{3}{8} R$ ,  $8 \frac{1}{8}$ ,  $17 \frac{3}{4}$  MIN.,  $9 \frac{1}{8}$ ,  $6 \frac{3}{8}$ ,  $35^\circ 21'$
- Labels: MOUNTING TABS, X (NOTE-3), Z, Y, A, A'

**Side View (Top Right):**

- Overall height:  $5 \frac{1}{2} \pm \frac{1}{4}$
- Internal dimensions:  $9 \frac{1}{16} R$ ,  $53 \frac{1}{4} R$ ,  $86^\circ$ ,  $2 \frac{7}{16}$ ,  $20 \frac{1}{4} R$
- Labels: EXTERNAL CONDUCTIVE COATING, REF. LINE

**Bottom View (Bottom Left):**

- Overall width:  $17 \frac{17}{64} \pm \frac{3}{32}$
- Internal dimensions:  $9 \frac{1}{16} R$ ,  $53 \frac{1}{4} R$ ,  $20 \frac{1}{4} R$ ,  $2 \frac{1}{16}$ ,  $2 \pm \frac{1}{8}$ ,  $2 \frac{27}{32}$
- Labels: EDGE OF SHIELD, SEAL LINE, CENTERLINE A-A', J1-21, REFERENCE LINE (NOTE-1),  $Y = .575X^2 + .576$ ,  $1.125 \text{ O.D. } +.043 \text{ } -.025$

**Bottom View of Base (Bottom Right):**

- Label: BOTTOM VIEW OF BASE (NOTE-2)
- Dimensions: 2, 3, 4, 5, 6, 7, 8, 30, 30

**Other Labels:**

- USEFUL SCREEN AREA
- 12  $\frac{1}{16}$  MIN.
- 102°
- B7-208

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"  $\pm$ .025"Plane of X to plane of Z =  $.738'' \pm .045''$