

ELECTRONIC TUBE REFERENCE

19EHP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Wide-angle aluminized P4 monochrome television picture tube using electrostatic focusing and magnetic deflection, designed for high-voltage direct-view service with a large approximately 19-inch screen.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8HR	BASE PINS	—
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	18000 V
Cathode-ray picture-tube section; anode rating and published direct capacitances captured from supplied family sheet.	

19EHP4

The **19EHP4** is a 19-inch direct-viewed, rectangular glass television picture tube. It features electrostatic focusing and magnetic deflection, utilizing a low anode voltage design. The tube incorporates an aluminized P4 phosphor screen, a gray filter glass faceplate, and integral implosion protection via a banded rimband system. It does not require an ion trap.

Mechanical Design and Physical Dimensions

The 19EHP4 is constructed using a J149F glass bulb with a neck diameter of 1 1/8 inches. It features a recessed small cavity cap (J1-21) for the high-voltage anode contact and a B7-208 base. The physical dimensions and mechanical limits of the tube are as follows:

- **Overall Length:** 11 5/8 ± 1/4 inches
- **Neck Length:** 4 3/8 ± 1/8 inches
- **Minimum Useful Screen Dimensions:**
 - Height: 12 inches
 - Width: 15 3/16 inches
 - Diagonal: 17 9/16 inches
- **Minimum Useful Screen Area:** 172 square inches
- **Weight:** Approximately 15 pounds

The faceplate is made of gray filter glass with approximately 49% light transmittance to improve contrast. The screen uses an aluminized P4 phosphor, which exhibits white fluorescence and medium-short persistence.

Deflection and Alignment

The tube utilizes magnetic deflection with the following approximate deflection angles:

- **Horizontal:** 101°
- **Diagonal:** 114°
- **Vertical:** 86°

The 8HR basing arrangement requires specific physical alignment. Base pin number 4 (the focusing electrode) aligns with the horizontal centerline (A-A') within a tolerance of 30° and is positioned on the same side of the neck as the recessed anode contact.

Electrical Connections and Basing

The 19EHP4 uses an 8-pin base designated as **Basing 8HR**. The pin connections, viewed from the bottom of the base, are assigned as follows:

Pin Number	Connection
Pin 1	Heater (H)
Pin 2	Grid No. 1 (G1)
Pin 3	Grid No. 2 (G2)
Pin 4	Grid No. 4 (G4 / Focusing Electrode)
Pin 6	Grid No. 1 (G1)
Pin 7	Cathode (K)
Pin 8	Heater (H)
Recessed Cap	Anode (A)

Note that Pin 5 is omitted from the active connections in this basing configuration.

Heater Ratings and Capacitances

The heater is designed for a nominal voltage of 6.3 Volts and a current of 0.60 Ampere (with a tolerance of $\pm 5\%$). The heater warm-up time is rated at 11 seconds. This warm-up period is defined as the time required for the heater to reach 80% of its rated voltage when operated in series with a resistance equal to three times the rated heater resistance at four times the rated voltage.

Interelectrode Capacitances

The approximate capacitances between the internal elements and external structures are:

- **Cathode to all other electrodes:** 5 pF
- **Grid No. 1 to all other electrodes:** 6 pF
- **External conductive coating and rimband to anode:** 1000 pF (minimum) to 1500 pF (maximum)

The electrical resistance between the external conductive coating and the rimband must be a minimum of 50 Megohms.

Operating Modes and Design-Maximum Ratings

The 19EHP4 can be operated in either Grid Drive or Cathode Drive configurations. The design-maximum ratings and typical operating conditions differ depending on the chosen drive service.

Grid Drive Service

In Grid Drive configuration, control signals are applied to Grid No. 1.

- **Anode Voltage:** 10,000 Volts DC (minimum) to 18,000 Volts DC (maximum)
- **Grid No. 4 (Focusing Electrode) Voltage:** -550 to ± 1100 Volts DC
- **Grid No. 2 Voltage:** 200 Volts DC (minimum) to 550 Volts DC (maximum)
- **Grid No. 1 Voltage:**
 - Negative bias value: 155 Volts DC (maximum)
 - Negative peak value: 220 Volts (maximum)
 - Positive bias value: 0 Volts DC (maximum)
 - Positive peak value: 2 Volts (maximum)
- **Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode (during warm-up period ≤ 15 seconds): 450 Volts (maximum)
 - Heater negative with respect to cathode (after warm-up): 200 Volts (maximum)
 - Heater positive with respect to cathode: 200 Volts (maximum)

Cathode Drive Service

In Cathode Drive configuration, control signals are applied to the cathode.

- **Anode Voltage:** 10,000 Volts DC (minimum) to 18,000 Volts DC (maximum)

- **Grid No. 4 (Focusing Electrode) Voltage:** -400 to +1250 Volts DC
- **Grid No. 2 Voltage:** 350 Volts DC (minimum) to 700 Volts DC (maximum)
- **Cathode Voltage:**
 - Positive bias value: 155 Volts DC (maximum)
 - Positive peak value: 220 Volts (maximum)
 - Negative bias value: 0 Volts DC (maximum)
 - Negative peak value: 2 Volts (maximum)
- **Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode (during warm-up period ≤ 15 seconds): 450 Volts (maximum)
 - Heater negative with respect to cathode (after warm-up): 300 Volts (maximum)
 - Heater negative with respect to cathode (DC component): 200 Volts DC (maximum)
 - Heater positive with respect to cathode: 200 Volts (maximum)
 - Heater positive with respect to cathode (DC component): 100 Volts DC (maximum)

Typical Operating Conditions

The typical operating parameters for both drive configurations are established at an anode voltage of 16,000 Volts DC:

Parameter	Grid Drive Service	Cathode Drive Service
Anode Voltage	16,000 V DC	16,000 V DC
Grid No. 4 Voltage for Focus	0 to 400 V DC	0 to 400 V DC
Grid No. 2 Voltage	300 V DC	400 V DC
Cutoff Voltage	-35 to -72 V DC (Grid No. 1)	40 to 76 V DC (Cathode)

Circuit and Safety Requirements

To ensure stable and safe operation, the following circuit values and safety precautions must be observed:

- **Grid No. 1 Circuit Resistance:** The maximum allowable resistance in the Grid No. 1 circuit is 1.5 Megohms.
- **Grounding:** The external conductive coating and the rimbands must be securely connected to the chassis ground. This grounding is necessary to utilize the capacitance between the coating and the anode as a filter capacitor.
- **X-ray Radiation Warning:** The 19EHP4 may produce X-rays when operated. Adequate shielding must be provided if the tube is operated at voltages higher than 16,000 Volts, or higher than the maximum rated anode voltage of 18,000 Volts, whichever of these two values is less.



SOURCE OPERATING CONDITIONS

1950 Sylvania

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1950 SYLVANIA

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	P4	—
Focusing method	Electrostatic	—
Deflection method	Magnetic	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1965 Sylvania Electronic Tubes Vol3

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Cathode Ray

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	600 mA	—
FocusingMethod	Electrostatic	—
DeflectionMethod	Magnetic	—
Phosphor	Aluminized P4 white	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DeflectionAngles	110-class magnetic	—
Cathode To All Capacitance	5 pF	—
Grid1 To All Capacitance	6 pF	—
ExternalConductiveCoatingToAnodeCapacitanceMaximum	1500 pF	—
ExternalConductiveCoatingToAnodeCapacitanceMinimum	1000 pF	—
RimbandToExternalCoatingResistanceMinimum	50 Mohm	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
AnodeVoltageMaximum	18000 V	—
AnodeVoltageMinimum	10000 V	—
FocusingElectrodeVoltageRangeMaximum	-400 to +1250 V	—
Grid2VoltageMaximum	700 V	—
Grid2VoltageMinimum	350 V	—
Grid1NegativeBiasMagnitudeMaximum	140 V	—
Grid1PositivePeakVoltageMaximum	2 V	—
HeaterCathodeVoltageMaximum	450 V	Warmup<=15s;HeaterNegative
HeaterCathodeVoltageMaximum	200 V	AfterWarmup
HeaterCathodeVoltageMaximum	200 V	HeaterPositive
Anode Voltage	16000 V	—
FocusingElectrodeVoltage	0 to +400 V	—
Grid1VoltageForCutoff	-35 to -72 V	—
Grid1CircuitResistanceMaximum	1.5 Mohm	—

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and their source documents.

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