

ELECTRONIC TUBE REFERENCE

19AXP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch direct-view monochrome television picture tube with electrostatic focusing, magnetic deflection, and an aluminized P4 screen. Manufacturer documentation places it in the high-voltage picture-tube family used for bright, high-contrast receiver display.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8HR	BASE PINS	–
NOMINAL HEATER	6.3 V / 450 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	23000 V
Cathode-ray picture-tube section; anode rating and published direct capacitances captured from supplied family sheet.	

19AXP4 — Rectangular Glass Television Picture Tube

The **19AXP4** is a 19-inch, direct-view, rectangular glass television picture tube designed for use in television receivers. It features a spherical gray filter glass faceplate, electrostatic focusing, and magnetic deflection. The tube incorporates an aluminized P4 phosphor screen and does not require an ion trap.

Design and Mechanical Construction

The 19AXP4 is built using a J149A glass bulb and a B7-208 base, utilizing the 8HR basing configuration. It has a nominal weight of approximately 13 1/2 pounds. The physical structure is characterized by a short

neck and a wide deflection angle, which minimizes the overall depth of the tube.

Physical Dimensions

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

Optical and Screen Characteristics

- **Faceplate:** Spherical, gray filter glass with approximately 78% light transmittance.
- **Screen Phosphor:** Aluminized P4 phosphor, which exhibits white fluorescence and short-to-medium persistence.
- **Deflection Angle:** 114° diagonal deflection (101° horizontal deflection, 86° vertical deflection).
- **Deflection Method:** Magnetic.
- **Focusing Method:** Electrostatic.
- **Anode Connection:** Recessed small cavity cap (J1-21).
- **External Coating:** External conductive coating, which must be grounded.

Electrical Characteristics and Ratings

The 19AXP4 is designed with an indirectly heated cathode. The heater is rated for series or parallel operation with a controlled warm-up time.

Heater Ratings

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.60 Ampere ± 5%
- **Heater Warm-up Time:** 11 Seconds

Direct Interelectrode Capacitances

- **Cathode to All Other Electrodes:** 5 µpf (approx.)
- **Grid No. 1 to All Other Electrodes:** 6 µpf (approx.)
- **External Conductive Coating to Anode:** 1000 µpf minimum, 1500 µpf maximum

Pinout and Basing (8HR)

The 8HR base connections are as follows:

- **Pin 1:** Grid No. 1
- **Pin 2:** Cathode
- **Pin 3:** Grid No. 2
- **Pin 4:** Grid No. 4 (Focusing Electrode) — this electrode aligns with the horizontal centerline within 30° on the same side as the anode contact.
- **Pin 6:** Grid No. 1
- **Pin 7:** Heater
- **Pin 8:** Heater
- **Cap:** Anode (J1-21)

Operating Modes and Technical Specifications

The 19AXP4 can be operated under either Grid Drive Service or Cathode Drive Service. The maximum ratings and typical operating conditions for each mode are detailed below.

Grid Drive Service

In Grid Drive Service, electrode voltages are referenced to the cathode.

Design Maximum Ratings

- **Anode Voltage:** 10,000 to 20,000 Volts dc
- **Grid No. 4 Voltage (Focusing Electrode):** -550 to +1100 Volts dc
- **Grid No. 2 Voltage:** 200 to 550 Volts dc
- **Grid No. 1 Voltage:**
 - Negative Bias Value: 154 Volts dc
 - Negative Peak Value: 220 Volts
 - Positive Bias Value: 0 Volts dc
 - Positive Peak Value: 2 Volts

Typical Operating Conditions

- **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:** -46 to -94 Volts dc (for visual extinction of a focused raster; this value increases by approximately 5 Volts for an undeflected focused spot).

Cathode Drive Service

In Cathode Drive Service, electrode voltages are referenced to Grid No. 1.

Design Maximum Ratings

- **Anode Voltage:** 10,000 to 20,000 Volts dc

- **Grid No. 4 Voltage (Focusing Electrode):** -400 to +1250 Volts dc
- **Grid No. 2 Voltage:** 350 to 700 Volts dc
- **Cathode Voltage:**
 - Positive Bias Value: 154 Volts dc
 - Positive Peak Value: 220 Volts
 - Negative Bias Value: 0 Volts dc
 - Negative Peak Value: 2 Volts

Typical Operating Conditions

- **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:** 42 to 78 Volts dc (for visual extinction of a focused raster; this value increases by approximately 5 Volts for an undeflected focused spot).

Common Circuit and Insulation Limits

Regardless of the drive service, the following limits must be maintained:

- **Peak Heater-Cathode Voltage:**
 - Heater Negative with Respect to Cathode (during warm-up ≤ 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
- **Grid No. 1 Circuit Resistance:** 1.5 Megohms maximum

Technical Summary

The **19AXP4** is a high-performance, 19-inch rectangular television picture tube utilizing a 114° magnetic deflection angle and electrostatic focusing. It features a spherical gray filter glass faceplate with 78% light transmittance and an aluminized P4 phosphor screen. The tube is highly versatile, supporting both Grid Drive and Cathode Drive configurations with distinct voltage ratings and cutoff characteristics. Its heater operates at 6.3 V and 0.60 A with an 11-second warm-up time, and its external conductive coating provides up to 1500 μpf of capacitance to assist in high-voltage filtering when grounded.



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	450 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

CHARACTERISTICS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	Electrostatic	—
Deflection method	Magnetic	—
Horizontal deflection angle	102 deg	—
Diagonal deflection angle	114 deg	—
Vertical deflection angle	86 deg	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Fluorescence	White	—
Persistence	Short to medium	—
Heater voltage	6.3 V	—
Heater current	600 mA	—

CONSTRUCTION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	Aluminized P4	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum anode voltage	20000 V	—
Typical anode voltage	16000 V	—
Typical focus-electrode voltage maximum	400 V	—
Typical grid2 voltage	500 V	—
Cutoff voltage range	-43 to -78 V	—
Grid1 circuit resistance maximum	1.5 Mohm	—
Anode voltage minimum	10000 V	—
Focus-electrode voltage range	-400 to +1250 V	—
Grid2 voltage minimum	350 V	—
Grid2 voltage maximum	700 V	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid1-to-all capacitance	6 pF	—
External conductive coating to anode capacitance maximum	1500 pF	—

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Monochrome television picture display	—