

ELECTRONIC TUBE REFERENCE

19ANP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Wide-angle P4 monochrome television picture tube designed for high-voltage direct-view service, with magnetic deflection and manufacturer warnings concerning X-ray shielding at elevated anode voltages.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	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	20000 V
Published ratings and characteristics promoted semantically from the approved source.	

19ANP4 — Tri-Potential Electrostatic Focus Television Picture Tube

A 19-inch direct-view rectangular glass television picture tube featuring tri-potential electrostatic focusing, 114-degree magnetic deflection, and an aluminized P4 phosphor screen.

Overview

The **19ANP4** is a rectangular glass television picture tube designed for direct-view applications. It features a spherical faceplate, a short neck, and a high-angle magnetic deflection system. The tube utilizes tri-potential electrostatic focusing and does not require an ion trap. Its screen is finished with an aluminized P4 phosphor that produces white fluorescence with short to medium persistence. To prevent

electrostatic charge buildup, the tube is equipped with an external conductive coating that must be grounded during operation.

Mechanical and Physical Specifications

The 19ANP4 is constructed using a J149A1 glass bulb and a B7-208 base. The physical dimensions and mechanical limits of the tube include:

- **Overall Length:** 10-13/16 ± 1/4 inches
- **Neck Length:** 3-3/16 to 3-9/16 inches ± 1/8 inch
- **Neck Diameter:** 1-1/8 inches
- **Weight:** Approximately 14 lbs
- **Bulb Contact:** Recessed Small Cavity Cap (J1-21)
- **Basing Arrangement:** 8JR
- **Faceplate:** Gray filter glass with approximately 78% light transmittance
- **Minimum Useful Screen Dimensions:** 15-1/8 x 12 inches
- **Minimum Useful Screen Area:** 172 square inches

Deflection Angles

The magnetic deflection system of the 19ANP4 is designed for wide-angle scanning to minimize the overall depth of the television cabinet:

- **Diagonal Deflection:** 114°
- **Horizontal Deflection:** 102°
- **Vertical Deflection:** 85°

Heater and Electrical Connections

The 19ANP4 is equipped with an indirectly heated cathode. The heater is designed for efficient operation with a rapid warm-up characteristic.

Parameter	Value
Heater Voltage	6.3 V
Heater Current	0.450 A ± 5%
Heater Warm-up Time	11 seconds

Note: The heater current of the 19ANP4 is 0.450 A, which distinguishes it from the related [19YP4](#), which requires 0.600 A.

Pinout and Basing (8JR)

The 8JR basing configuration provides the following electrode connections, viewed from the bottom of the tube base:

- **Pin 1:** Heater (H)
- **Pin 2:** Grid No. 1 (G1)
- **Pin 3:** Grid No. 2 (G2)
- **Pin 4:** Grid No. 3 (G3) (Focusing Electrode)
- **Pin 6:** Internal Connection (IC) — *Do not use*
- **Pin 7:** Cathode (K)
- **Pin 8:** Heater (H)
- **Recessed Cap:** Anode (A, Grid No. 4 / Screen)

Pin 4 is positioned such that it aligns with the horizontal centerline within 30° on the same side as the anode contact cap.

Interelectrode Capacitances

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

Operating Services and Design-Maximum Ratings

The 19ANP4 can be operated in either Grid Drive Service or Cathode Drive Service. The design-maximum ratings represent the absolute limits within which the tube must be operated to ensure reliability and performance.

Grid Drive Service Ratings

- **Anode Voltage:** 20,000 V dc maximum, 11,000 V dc minimum
- **Grid No. 3 Voltage (Focusing Electrode):** -350 to +700 V dc
- **Grid No. 2 Voltage:** 600 V dc maximum, 300 V dc minimum
- **Grid No. 1 Voltage:**
 - Negative Bias Value: 155 V dc maximum
 - Negative Peak Value: 220 V maximum
 - Positive Bias Value: 0 V dc maximum
 - Positive Peak Value: 2 V maximum

Cathode Drive Service Ratings

- **Anode Voltage:** 20,000 V dc maximum, 11,000 V dc minimum
- **Grid No. 3 Voltage (Focusing Electrode):** -200 to +850 V dc
- **Grid No. 2 Voltage:** 750 V dc maximum, 450 V dc minimum

- **Cathode Voltage:**
 - Positive Bias Value: 155 V dc maximum
 - Positive Peak Value: 220 V maximum
 - Negative Bias Value: 0 V dc maximum
 - Negative Peak Value: 2 V maximum

Peak Heater-Cathode Voltage (Both Services)

- **Heater Negative with Respect to Cathode:**
 - During warm-up period (not to exceed 15 seconds): 450 V maximum
 - After equipment warm-up: 200 V maximum
- **Heater Positive with Respect to Cathode:** 200 V maximum

Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 Megohms maximum

Typical Operating Conditions

Under typical operating conditions, the focusing and cutoff characteristics vary depending on whether grid drive or cathode drive is selected.

Grid Drive Service

- **Anode Voltage:** 16,000 V dc
- **Grid No. 3 Voltage for Focus:** 0 to 400 V dc
- **Grid No. 2 Voltage:** 500 V dc
- **Grid No. 1 Voltage for Cutoff:** -43 to -78 V dc (for visual extinction of a focused raster; visual extinction of a stationary focused spot requires approximately 5 V more negative bias)

Cathode Drive Service

- **Anode Voltage:** 16,000 V dc
- **Grid No. 3 Voltage for Focus:** 0 to 400 V dc
- **Grid No. 2 Voltage:** 500 V dc
- **Grid No. 1 Voltage:** 0 V dc
- **Cathode Voltage for Cutoff:** 41 to 69 V dc

Technical Summary

The **19ANP4** is a highly specialized 19-inch television picture tube utilizing a space-saving short-neck design and 114-degree magnetic deflection. Its tri-potential electrostatic focusing system allows for precise beam control under both Grid Drive and Cathode Drive configurations. With a standard 6.3 V, 0.450 A heater, an aluminized P4 screen, and robust design-maximum ratings up to 20,000 V on the

anode, the 19ANP4 provides a reliable, high-brightness display solution for direct-view television receivers.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	20000 V	—
Anode Voltage	16000 V	—

CHARACTERISTIC

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	P4	Aluminized



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	Tri-potential electrostatic	—
Deflection method	Magnetic	—
Horizontal deflection angle	102 deg	—
Diagonal deflection angle	114 deg	—
Vertical deflection angle	85 deg	—
Fluorescence	White	—
Persistence	Short to medium	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
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 grid2 voltage	500 V	—
Cutoff voltage range	-43 to -78 V	—
Grid1 circuit resistance maximum	1.5 Mohm	—
Anode voltage minimum	11000 V	—
Grid2 voltage minimum	300 V	—
Grid2 voltage maximum	600 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	—

TUBE TINKER

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