



ELECTRONIC TUBE REFERENCE

19CYP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch electrostatically focused, magnetically deflected direct-view CRT with an aluminized P4 screen. Designed for high-voltage monochrome picture service, its manufacturer documentation includes an X-ray radiation warning.

GENERAL CHARACTERISTICS

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

SECTION RATINGS

SECTION 1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	23000 V
MAXIMUM SCREEN VOLTAGE	550 V
MAXIMUM HEATER-CATHODE VOLTAGE	180 V
<i>CRT anode and grid-2 maximum ratings are promoted from the printed ratings block; other CRT-specific focus/drive/deflection values are preserved in parameters.</i>	

19CYP4

The **19CYP4** is a 19-inch cathode ray tube designed with a 114-degree diagonal deflection angle. It features electrostatic focusing and magnetic deflection, utilizing a straight electron gun that does not require an ion trap. The tube is equipped with a metal-backed, aluminized screen containing P4 phosphor to provide a bright, high-contrast display.

Physical and Mechanical Characteristics

The 19CYP4 is constructed with a glass bulb designated as EIA J-149-A1. It features a JEDEC J1-21 Ultor recessed small cavity cap for high-voltage connection, which is aligned with pin position 4 within a tolerance of ± 30 degrees. The tube utilizes a JEDEC B7-208 Small Button Neoeightar 7-pin base with an 8HR basing configuration.

Dimensions and Screen Area

The physical dimensions of the tube are highly compact relative to its screen size:

- **Overall Length:** 10 7/8 $\pm$ 1/4 inches
- **Neck Length:** 3 5/8 $\pm$ 1/8 inches
- **Greatest Diagonal:** 18 5/8 $\pm$ 1/8 inches
- **Greatest Width:** 16 13/32 $\pm$ 1/8 inches
- **Greatest Height:** 13 11/32 $\pm$ 1/8 inches

The projected minimum useful screen dimensions are:

- **Diagonal:** 17 9/16 inches
- **Horizontal Axis:** 15 1/8 inches
- **Vertical Axis:** 12 inches
- **Total Useful Area:** 172 square inches

Optical Properties

The screen uses a P4-Aluminized phosphor. The light transmittance at the center of the faceplate is approximately 78%.

Electrical Connections and Pinout

The 19CYP4 uses the JEDEC 8HR basing arrangement. The pin assignments, viewed from the bottom of the base, are as follows:

Pin Number	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 3	Grid No. 2
Pin 4	Grid No. 4 (Focusing Electrode)
Pin 6	Grid No. 1
Pin 7	Cathode
Pin 8	Heater

Pin Number	Connection
Cap	Ultor (Grid No. 3, Grid No. 5, Collector)

Note that Grid No. 1 is connected to both Pin 2 and Pin 6.

Heater and Capacitance Ratings

The heater is designed for a nominal voltage of 6.3 V, with a Design-Maximum range of 5.7 V to 6.9 V. Under nominal operation, the heater draws a current of 600 ± 30 mA. The heater has a controlled warm-up time of 11 seconds.

Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** Approximately 5 μF
- **Grid No. 1 to all other electrodes:** Approximately 6 μF
- **External conductive coating to Anode:** 1,000 μF minimum to 1,500 μF maximum

Operating Ratings and Typical Conditions

The 19CYP4 operates under the Design-Maximum System. The operating limits and typical grid-drive service conditions are detailed below.

Design-Maximum Ratings

- **Anode Voltage:** 15,000 V minimum to 23,000 V maximum
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1000 V
- **Grid No. 2 Voltage:** 200 V minimum to 550 V maximum
- **Grid No. 1 Voltage:**
 - Maximum Negative DC Value: 154 V
 - Maximum Negative Peak Value: 220 V
 - Maximum Positive DC Value: 0 V
 - Maximum Positive Peak Value: 2 V
- **Heater-Cathode Voltage:**
 - Heater negative with respect to cathode (during warm-up, ≤ 15 seconds): 450 V maximum
 - Heater negative with respect to cathode (after warm-up): 200 V maximum
 - Heater positive with respect to cathode: 200 V maximum

Typical Operating Conditions (Grid Drive Service)

All operating voltages are specified as positive with respect to the cathode:

- **Anode Voltage:** 20,000 V DC
- **Grid No. 4 Voltage:** 0 to +400 V DC (satisfactory focus is achieved at some value within this range)

- **Grid No. 2 Voltage:** 400 V DC
- **Grid No. 1 Voltage:** -36 to -94 V DC (required range for visual extinction of the focused raster)

Maximum Circuit Values

The maximum resistance in the Grid No. 1 circuit must not exceed 1.5 Megohms.

Deflection and Safety Considerations

Deflection Angles

The tube is designed for wide-angle magnetic deflection, with approximate deflection angles as follows:

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

Safety Recommendations

Because of the high voltages and physical size of the tube, it is recommended to install a shatter-proof glass cover over the tube face. This cover serves a dual purpose, providing protection against potential implosions and offering shielding against x-ray radiation.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1956 National Video

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

1956 NATIONAL VIDEO

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical Anode Voltage	18000 V	—
Phosphor	P4	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage Nominal	6.3 V	—
Heater Current Nominal	600 mA	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to All Other Electrodes Capacitance	5 pF	Approximate
Grid 1 to All Other Electrodes Capacitance	6 pF	Approximate

TUBE TINKER

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