

ELECTRONIC TUBE REFERENCE

16AWP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Sixteen-inch P4 cathode-ray picture tube documented by General Electric for direct-view display service. Source detail is limited, so the classification remains conservatively television-oriented without assigning unsupported specialized construction properties.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	6.3 V / 300 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray
No fixed ratings recorded.

16AWP4 Cathode Ray Tube

The **16AWP4** is a 16-inch rectangular glass picture tube designed for use in television receivers. It features electrostatic focusing and magnetic deflection with a nominal 114-degree diagonal deflection angle. The tube is constructed with an integral plastic implosion barrier, a short overall length, a small neck diameter, and a non-ion trap gun. It is specifically designed for operation at a medium Grid No. 2 voltage in cathode-drive circuits.

Mechanical Design and Optical Characteristics

The 16AWP4 is built with a lightweight glass envelope and incorporates a spherical gray faceplate. The fluorescent screen is aluminized to maximize light output and minimize screen charging.

Physical Dimensions

- **Overall Length:** 10 1/8 ± 1/4 inches
- **Greatest Diagonal Dimension:** 15 11/16 ± 5/32 inches
- **Greatest Width:** 13 3/4 ± 1/8 inches
- **Greatest Height:** 11 5/32 ± 1/8 inches
- **Neck Length:** 4 ± 1/8 inches

Screen and Optical Specifications

- **Minimum Useful Screen Dimensions (Projected):**
 - **Diagonal:** 14 7/8 inches
 - **Horizontal Axis:** 12 15/16 inches
 - **Vertical Axis:** 10 1/4 inches
 - **Area:** 125 square inches
- **Phosphor Type:** P4 (Aluminized)
- **Light Transmittance at Center:** Approximately 48 percent

Bulb and Base Connections

The tube utilizes a J125A1 bulb with a JEDEC No. J1-21 bulb contact for the high-voltage anode connection. The base is a JEDEC No. B7-237 or B7-208, which corresponds to an 8HR basing configuration. The anode contact is aligned with base pin No. 4 within a tolerance of ± 30 degrees. The reference line of the tube is determined by the intersection of the plane C-C of an EIA No. 126 gage with the glass funnel.

Electrical Specifications and Basing

The 16AWP4 operates with an indirectly heated cathode and requires a standard heater supply.

Heater Characteristics

- **Heater Voltage:** 6.3 V (nominal)
- **Heater Current:** 300 ± 15 mA
- **Heater Warm-Up Time:** 18 seconds

Direct Interelectrode Capacitances

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

The external conductive coating serves as a filter capacitor for the high-voltage supply when it is properly grounded.

Pinout Configuration (8HR Basing)

The electrical connections on the base, viewed from the bottom, are assigned as follows:

- **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
- **Bulb Contact:** Anode

For proper installation, a non-rigidly mounted socket with flexible leads must be used. The bottom circumference of the base wafer is designed to fall within a 1-3/4 inch diameter circle concentric with the bulb axis.

Operating Ratings and Typical Conditions

The ratings for the 16AWP4 are established under the Design Maximum System. Unless otherwise specified, all voltage values are positive and measured with respect to Grid No. 1.

Design Maximum Ratings

- **Anode Voltage:** 11,000 V (minimum) to 18,000 V (maximum)
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1000 V
- **Grid No. 2 Voltage:** 100 V (minimum) to 300 V (maximum)
- **Cathode Voltage:**
 - **Maximum Positive DC Value:** 140 V
 - **Maximum Positive Peak Value:** 200 V
 - **Maximum Negative DC Value:** 0 V
 - **Maximum Negative Peak Value:** 2 V
- **Heater Voltage Limits:** 5.7 V (minimum) to 6.9 V (maximum)
- **Maximum Heater-Cathode Voltage:**
 - **Heater Negative with respect to Cathode:**
 - *During warm-up period (not to exceed 45 seconds):* 410 V
 - *After equipment warm-up period:* 180 V
 - **Heater Positive with respect to Cathode:** 180 V

Typical Operating Conditions (Cathode-Drive Service)

Under typical cathode-drive operating conditions, the tube is configured with the following parameters:

- **Anode Voltage:** 15,000 V DC

- **Grid No. 4 (Focusing Electrode) Voltage:** 250 V DC (Individual tubes will achieve satisfactory focus at some value between 0 V and 500 V DC)
- **Grid No. 2 Voltage:** 150 V DC
- **Cathode to Grid No. 1 Voltage for Cut-off:** 31 V to 49 V DC (defined by the visual extinction of a focused raster)

These typical focus and cut-off values are specified with the combined Grid No. 1 bias voltage and video-signal voltage adjusted to produce an anode current of 150 uA on a 12-15/16 inch by 10-1/4 inch pattern (using an RCA [2F21](#) monoscope or equivalent).

Circuit Integration and Protection

To ensure reliable operation and prevent damage to the tube's internal structures, specific circuit resistance limits must be observed.

Maximum Circuit Resistance Values

- **Grid No. 1 Circuit Resistance:** 1.5 megohms (maximum)
- **Grid No. 2 Circuit Resistance:** 0.1 megohms (minimum)
- **Focusing Electrode Circuit Resistance:** 0.1 megohms (minimum)

Protective Recommendations

It is highly advisable to include protective resistance in both the Grid No. 2 and the focusing electrical circuits to prevent damage to the tube from transient arcs or overloads. If applicable, a single common resistor may be shared between both of these circuits.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1968 General Electric Co

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

1968 GENERAL ELECTRIC CO

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltageNominal	6.3 V	—
HeaterOrFilamentCurrentNominal	300 mA	—