



ELECTRONIC TUBE REFERENCE

16AZP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Sixteen-inch P4 cathode-ray picture tube documented by General Electric. Available source information supports a conventional direct-view television display role, while sparse detail warrants avoiding unsupported specialized tags.

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

SECTION 1 Cathode Ray*No fixed ratings recorded.*

16AZP4 — Electrostatic-Focus Magnetic-Deflection Cathode Ray Tube

The **16AZP4** is a 16-inch rectangular glass picture tube designed for television receiver applications. It features a spherical gray faceplate, an integral plastic implosion barrier, and an aluminized fluorescent screen utilizing P4 phosphor. The tube is characterized by its lightweight construction, short overall length, small neck diameter, and a non-ion trap gun designed specifically for operation at an intermediate Grid No. 2 voltage in cathode-drive circuits. Additionally, it incorporates an external conductive coating that, when grounded, serves as a high-voltage filter capacitor.

Mechanical Design and Physical Dimensions

The 16AZP4 is built with a J125A1 glass bulb and has a nominal diagonal screen size of 16 inches. Its physical dimensions are optimized for compact television cabinet designs:

- **Overall Length:** $10\text{-}3/8 \pm 1/4$ inches
- **Neck Length:** $4\text{-}1/4 \pm 1/8$ inches
- **Greatest Dimensions:**
 - Diagonal: $15\text{-}11/16 + 5/32 / -1/8$ inches
 - Width: $13\text{-}3/4 \pm 1/8$ inches
 - Height: $11\text{-}5/32 \pm 1/8$ inches
- **Minimum Useful Screen Dimensions (Projected):**
 - Diagonal: $14\text{-}7/8$ inches
 - Horizontal Axis: $12\text{-}15/16$ inches
 - Vertical Axis: $10\text{-}1/4$ inches
 - Total Area: 125 square inches

The faceplate is a spherical gray glass designed to improve contrast. The screen is aluminized to maximize light output and prevent undesirable screen charging. An integral plastic implosion barrier is bonded directly to the tube to enhance safety.

The tube uses a JEDEC No. J1-21 anode bulb contact. The base is a JEDEC No. B7-237 or B7-208, which corresponds to the **8HR** basing configuration. The anode contact is aligned with base pin number 4 within a tolerance of ± 30 degrees. To prevent mechanical stress on the tube neck, a non-rigidly mounted socket with flexible leads must be used, ensuring that the bottom circumference of the base wafer falls within a $1\text{-}3/4$ inch diameter circle concentric with the bulb axis.

Electrical and Interelectrode Characteristics

The 16AZP4 is designed with a 6.3 V heater that has a controlled warm-up time, making it suitable for series or parallel heater strings.

Parameter	Value
Nominal Heater Voltage	6.3 V
Heater Current	450 ± 23 mA
Heater Warm-up Time	11 seconds
Focusing Method	Electrostatic
Deflection Method	Magnetic
Horizontal Deflection Angle	102 degrees
Vertical Deflection Angle	84 degrees

Parameter	Value
Diagonal Deflection Angle	114 degrees

Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** approximately 5 pF ($\mu\mu\text{F}$)
- **Grid No. 1 to all other electrodes:** approximately 6 pF ($\mu\mu\text{F}$)
- **External conductive coating to Anode:** 1000 pF minimum to 1500 pF maximum (acting as a filter capacitor when the coating is grounded)

Basing and Terminal Connections

The **8HR** basing diagram provides the following pin connections (viewed from the bottom of the base):

- **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 (Recessed Cavity):** Anode (Grid No. 3, Grid No. 5, Screen)

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

Absolute Maximum Ratings (Design Maximum System)

All voltage values are positive and measured with respect to Grid No. 1, unless otherwise specified.

- **Anode Voltage:**
 - Maximum: 18,000 V
 - Minimum: 11,000 V
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 to +1000 V
- **Grid No. 2 Voltage:**
 - Minimum: 100 V
 - Maximum: 250 V
- **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:**

- Maximum: 6.9 V
- Minimum: 5.7 V
- **Maximum Heater-Cathode Voltage:**
 - Heater negative with respect to cathode during warm-up (not to exceed 15 seconds): 410 V
 - Heater negative with respect to cathode after warm-up: 180 V
 - Heater positive with respect to cathode: 180 V

Typical Operating Conditions (Cathode-Drive Service)

In typical cathode-drive service, the input signal is applied to the cathode, and Grid No. 1 is typically held at a fixed reference potential (often ground). Under these conditions, the typical operating parameters are:

- **Anode Voltage:** 15,000 V DC
- **Grid No. 4 (Focusing Electrode) Voltage:** 250 V DC
- **Grid No. 2 Voltage:** 150 V DC
- **Cathode-to-Grid No. 1 Voltage for Cut-off:** 31 to 49 V (defined as visual extinction of the focused raster)

The typical focus voltage of 250 V is specified with the combined Grid No. 1 bias voltage and video-signal voltage adjusted to produce an anode current of 150 μ A on a 12-15/16" x 10-1/4" pattern (such as that generated by an RCA [2F21](#) monoscope or equivalent). Individual tubes will achieve satisfactory focus at some value between 0 and 400 V under these conditions.

Circuit Design and Protective Requirements

To ensure reliable operation and prevent damage to the tube's electrodes from internal arcing or transient overvoltages, specific circuit resistance limits and protective measures must be observed:

- **Maximum Grid No. 1 Circuit Resistance:** 1.5 megohms
- **Minimum Grid No. 2 Circuit Resistance:** 0.1 megohm
- **Minimum Focusing Electrode (Grid No. 4) Circuit Resistance:** 0.1 megohm

It is highly advisable to include protective series resistance in both the Grid No. 2 and the focusing electrode electrical circuits. If applicable, a single common resistor may be used to protect both of these circuits simultaneously.

The reference line of the tube's funnel is determined by the intersection of the plane C-C of an EIA No. 126 gage with the glass funnel.

Technical Summary

The **16AZP4** is a specialized 16-inch rectangular glass cathode ray tube featuring a 114-degree diagonal deflection angle, electrostatic focusing, and magnetic deflection. Designed for cathode-drive television receiver circuits, it operates at moderate anode voltages (11,000 to 18,000 V) and utilizes an intermediate Grid No. 2 voltage. Its design incorporates an aluminized P4 phosphor screen, a spherical gray faceplate,

and an integral plastic implosion barrier for safety. With its compact 10-3/8 inch overall length and lightweight construction, the 16AZP4 represents a highly integrated display solution for its era, combining built-in implosion protection and high-voltage filtering via its external conductive coating.



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	450 mA	—

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