



ELECTRONIC TUBE REFERENCE

16BGP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Sixteen-inch P4 direct-view picture tube using low-voltage electrostatic focusing and magnetic deflection. RCA data show approximately 16 kV anode operation and a large projected screen area for television-picture presentation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
NOMINAL HEATER	6.3 V / 20 A	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM SCREEN VOLTAGE	550 V
CRT-specific ratings, operating conditions, capacitances, focus/deflection, cutoff, optical, and screen data are retained in section parameters.	

16BGP4 — Rectangular Picture Tube with Integral Implosion Protection

Overview

The **16BGP4** is a rectangular glass-envelope picture tube designed for television display applications. It features PAN-O-PLY integral implosion protection, which utilizes a formed rim and welded tension bands around the periphery of the tube panel. This design eliminates the need for a separate safety glass or an integral protective window in the receiver cabinet.

The tube incorporates an aluminized screen with a P4-sulfide phosphor, low-voltage electrostatic focusing, and a 114-degree magnetic deflection system. Its electron gun is designed to operate without the need for an external ion-trap magnet.

Mechanical and Optical Characteristics

The 16BGP4 is built with a rectangular glass bulb and a filterglass faceplate. The faceplate provides an approximate light transmission of 54% at its center, enhancing picture contrast under ambient light conditions.

Physical Dimensions and Weight

- **Overall Length:** 10.569" $\pm$ 0.242"
- **Neck Length:** 4.375" $\pm$ 0.125"
- **Projected Screen Area:** 125 sq. in.
- **Weight:** Approximately 9.5 lbs (including the integral implosion protection hardware)

External Coatings and Connections

The tube features a regular band type external conductive coating. The contact area for grounding this coating is located near the reference line. High-voltage connection to the anode is made via a recessed small cavity cap (JEDEC No. J1-21). The base is a Small-Button Neoeightar 7-pin configuration (Arrangement 1, JEDEC No. B7-208).

Basing and Electrical Connections

The 16BGP4 utilizes the **8HR** bottom-view basing arrangement. The pin and cap connections are defined as follows:

Pin / Cap	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 3	Grid No. 2
Pin 4	Grid No. 4
Pin 6	Grid No. 1
Pin 7	Cathode
Pin 8	Heater
Cap	Anode (Grid No. 3, Grid No. 5, Screen, Collector)
C	External Conductive Coating

Grid No. 1 is internally connected to both Pin 2 and Pin 6. The anode cap provides connection to Grid No. 3, Grid No. 5, the screen, and the collector. The external conductive coating (C) forms a capacitance with the internal anode coating.

Heater and Interelectrode Capacitances

The 16BGP4 is equipped with an indirectly heated cathode. The heater is designed for a nominal 6.3 V supply.

- **Heater Current:** 450 ± 20 mA (at 6.3 V)
- **Average Heater Warm-Up Time:** 11 seconds

Direct Interelectrode Capacitances

- **Grid No. 1 to all other electrodes:** 6 pF
- **Cathode to all other electrodes:** 5 pF
- **External conductive coating to anode:** 1300 pF maximum, 800 pF minimum (including implosion protection hardware)

Design-Maximum Ratings

The ratings below are established under the Design-Maximum system. Unless otherwise specified, all voltage values are positive with respect to the cathode.

Electrode Voltages

- **Anode Voltage:** 20,000 V maximum, 12,000 V minimum
- **Grid-No. 4 Voltage (Focusing Electrode):**
 - Positive value: 1100 V maximum
 - Negative value: 550 V maximum
- **Grid-No. 2 Voltage:** 550 V maximum, 200 V minimum
- **Grid-No. 1 Voltage:**
 - Negative peak value: 220 V maximum
 - Negative bias value: 155 V maximum
 - Positive bias value: 0 V maximum
 - Positive peak value: 2 V maximum
- **Heater Voltage:** 6.9 V maximum, 5.7 V minimum

Peak Heater-Cathode Voltage

- **Heater negative with respect to cathode:**
 - During equipment warm-up period (not exceeding 15 seconds): 450 V maximum
 - After equipment warm-up period: 300 V maximum
- **Heater positive with respect to cathode:**

- Peak value: 200 V maximum
- DC component: 100 V maximum

Maximum Circuit Values

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

Typical Operating Conditions (Cathode-Drive Service)

In typical cathode-drive service, the electrode voltages are specified with respect to Grid No. 1:

- **Anode Voltage:** 16,000 V
- **Grid-No. 4 Voltage:** 100 V
- **Grid-No. 2 Voltage:** 300 V
- **Cathode Voltage for visual extinction of focused raster:** 28 to 60 V
- **Field Strength of required adjustable centering magnet:** 0 to 8 gauss

Focus Voltage Variation

While the typical Grid-No. 4 focus voltage is listed as 100 V, the actual voltage required for optimum focus on any individual tube may vary between -100 V and +300 V. This range is applicable when the combined cathode voltage and video-signal voltage are adjusted to produce an anode current of 100 microamperes on a 9-inch by 12-inch pattern (using an RCA-2F21 monoscope or equivalent).

Technical Summary

The **16BGP4** is a **114-degree magnetic deflection, low-voltage electrostatic focus picture tube** featuring **PAN-O-PLY integral implosion protection**. It operates with a **6.3 V, 450 mA heater** and utilizes a **Small-Button Neoeightar 7-pin base** with an **8HR basing designation**. The tube provides a **125 sq. in. projected screen area** on an aluminized P4-sulfide phosphor screen. Designed for cathode-drive service, it operates typically at an anode voltage of **16,000 V** and a Grid-No. 2 voltage of **300 V**, with a focus voltage range of **-100 to +300 V** for optimum raster sharpness.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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

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Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
LOW-VOLTAGE ELECTROSTATIC FOCUS – published value 1	1 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
LOW-VOLTAGE ELECTROSTATIC FOCUS – published value 2	14 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid No.1 to all other electrodes	6 pF	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Current at 6.3 volts – published value 1	6.3 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Current at 6.3 volts – published value 2	450 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Current at 6.3 volts – published value 3	20 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Warm-Up Time (Average)	11	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Light transmission at center (Approx)	54	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Projected Area of Screen	125	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Anode Voltage	16000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.2 Voltage	300 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
of focused raster – published value 1	28 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
of focused raster – published value 2	60 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
External conductive coating to anode°	1300 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.2 Voltage	550 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.1-Circuit Resistance	1.5 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

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