



ELECTRONIC TUBE REFERENCE

16BRP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Sixteen-inch P4 high-voltage direct-view picture tube documented by National Video. Typical anode operation is approximately 15 kV with an 18 kV maximum rating, supporting conventional monochrome television display service.

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	18000 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>	

16BRP4

The **16BRP4** is a 16-inch, 114-degree banded cathode ray tube designed for television display applications. It features electrostatic focusing, magnetic deflection, and a straight electron gun design that does not require an external ion trap. The tube is equipped with a 6.3-volt, 600-milliampere filament.

Electrical and Optical Characteristics

The electrical and optical parameters of the 16BRP4 establish its operating baseline for television receiver designs:

- **Heater Ratings:** The tube operates with a nominal heater voltage of 6.3 V and a heater current of 600 ± 30 mA. The heater warm-up time is 11 seconds.
- **Deflection Angles:** The approximate deflection angles are 103 degrees horizontally, 87 degrees vertically, and 114 degrees diagonally.
- **Direct Interelectrode Capacitances:**
 - Cathode to all other electrodes: 5 μ F (approximate)
 - Grid No. 1 to all other electrodes: 6 μ F (approximate)
 - External conductive coating to anode: 1500 μ F maximum, 1000 μ F minimum
- **Optical Details:** The tube utilizes a JEDEC-designated P4 Aluminized phosphor screen with a light transmittance of 53 percent.

Mechanical Design, Basing, and Installation

The physical structure of the 16BRP4 requires specific mounting and alignment considerations to ensure reliable operation:

- **Physical Dimensions:** The overall length of the tube is $10 \frac{9}{32} \pm \frac{5}{16}$ inches, with a neck length of $4 \frac{1}{8} \pm \frac{1}{8}$ inches. The greatest width is $13 \frac{15}{16}$ inches maximum, and the greatest height is $11 \frac{11}{32}$ inches maximum.
- **Screen Dimensions:** The minimum useful projected screen dimensions are $14 \frac{7}{8}$ inches diagonally, $12 \frac{15}{16}$ inches along the horizontal axis, and $10 \frac{1}{4}$ inches along the vertical axis, providing a minimum useful screen area of 125 square inches.
- **Bulb and Base Designations:** The bulb has an EIA designation of J125-B1 (or equivalent, including shield designation). The bulb contact is a JEDEC J1-21 recessed small cavity cap. The base is a JEDEC 8HR base, utilizing a B7-208 Small Button Neoeightar 7-pin basing arrangement.
- **Pin Connections:**
 - 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
 - Cap: Ultor (Grid No. 3, Grid No. 5, Collector)
 - External Coating: External conductive coating (C)
- **Installation and Alignment:** The J1-21 bulb contact aligns with pin position No. 2 within an angular tolerance of ± 30 degrees, and the ultor terminal is located on the same side of the tube as Pin No. 2. The socket for this base must not be rigidly mounted; it should have flexible leads and be allowed to move freely to prevent lateral strains on the base pins. The bottom circumference of the base wafer

fits within a 1 3/4-inch diameter circle concentric with the bulb axis. The external conductive coating must be grounded, and its surface should only be cleaned by wiping with a soft, dry, lint-free cloth. The tension band clip may extend an additional 0.075 inches beyond the specified dimensions.

Operating Conditions and Maximum Ratings

The operating limits and typical parameters of the 16BRP4 are defined under the Design Maximum System:

Design Maximum Ratings

- **Anode Voltage:** 18,000 Volts maximum, 10,000 Volts minimum
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 Volts to +1100 Volts
- **Grid No. 2 Voltage:** 550 Volts maximum, 200 Volts minimum
- **Grid No. 1 Voltage:**
 - Maximum negative DC value: 155 Volts
 - Maximum negative peak value: 220 Volts
 - Maximum positive DC value: 0 Volts
 - Maximum positive peak value: 2 Volts
- **Heater Voltage:** 6.9 Volts maximum, 5.8 Volts minimum
- **Maximum Heater-Cathode Voltage:**
 - *Heater negative with respect to cathode:* 450 Volts during a warm-up period not exceeding 15 seconds; 200 Volts after the equipment warm-up period.
 - *Heater positive with respect to cathode:* 200 Volts.

Typical Operating Conditions (Cathode Drive Service)

- **Anode Voltage:** 15,000 Volts DC
- **Grid No. 4 Voltage (Focusing Electrode):** 250 Volts DC (Individual tubes will achieve satisfactory focus at some value between 0 and 400 Volts, evaluated with the combined Grid No. 1 bias and video-signal voltage adjusted to give an anode current of 100 microamperes on a 12 15/16" x 10 1/4" pattern).
- **Grid No. 2 Voltage:** 400 Volts DC
- **Grid No. 1 Voltage:** -46 to -94 Volts DC (for visual extinction of the focused raster)
- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms

Technical Summary

The **16BRP4** is a 16-inch, 114-degree cathode ray tube featuring electrostatic focus, magnetic deflection, and a straight electron gun requiring no ion trap. It utilizes a JEDEC B7-208 Small Button Neoeightar 7-pin base and a J1-21 recessed small cavity cap for the ultor connection. With a nominal 6.3 V, 600 mA heater, a P4 aluminized screen, and typical anode operation at 15,000 V, it provides a reliable display solution when operated within its design maximum ratings and installed with a non-rigid, flexible socket.



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	15000 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

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