

Sixteen-inch aluminized P4 picture tube with electrostatic focusing and magnetic deflection. Its white medium-short-persistence screen uses wide-angle deflection and typically operates around 14 kV for bright direct-view television presentation.

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	
MAXIMUM PLATE VOLTAGE	18000 V
Published maximum ratings and characteristics promoted semantically from the approved source.	

16BEP4 — Television Picture Tube

The **16BEP4** is a 16-inch, direct-viewed, rectangular glass television picture tube designed for use in television receivers. It features a space-saving design with a short neck, a wide deflection angle, and an integrated protective faceplate. Key design features include electrostatic focusing, low Grid No. 2 operating voltage, magnetic deflection, an aluminized screen, and an external conductive bulb coating. The tube does not require an ion trap magnet.

Mechanical Construction and Optical Features

The 16BEP4 is constructed using a rectangular glass bulb (designated J125A) and incorporates a bonded shield design. This safety plate (designated FP125A) consists of a gray filter glass safety plate laminated

directly to the face of the tube. This integrated assembly provides physical protection and enhances picture contrast by reducing ambient light reflections. The light transmittance of the faceplate assembly is approximately 60 percent.

The screen utilizes an aluminized P4 phosphor, which produces a white fluorescence with medium-short persistence. The physical dimensions of the tube are highly compact relative to its screen size:

- **Minimum Useful Screen Dimensions (Maximum Assured):**

- **Height:** 10 1/4 inches
- **Width:** 12 15/16 inches
- **Diagonal:** 14 7/8 inches
- **Minimum Useful Screen Area:** 125 square inches

- **Neck Length:** 4 3/8 ± 1/8 inches
- **Overall Length:** 10 11/16 ± 3/16 inches
- **Approximate Weight:** 9 1/2 pounds

The tube is equipped with a recessed small cavity cap (J1-21) for the high-voltage anode connection, located on the funnel of the bulb. The base is a B7-208 type, which utilizes the 8HR basing configuration.

Heater and Basing Configuration

The 16BEP4 is equipped with an indirectly heated cathode. The heater is designed to operate under the following nominal conditions:

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.30 ± 5% Ampere (300 mA)
- **Heater Warm-up Time:** 11 seconds

The heater warm-up time is defined under specific test conditions: it is the time required for the voltage across the heater to reach 80% of its rated value when a voltage equal to four times the rated heater voltage is applied to a circuit consisting of the heater in series with a resistance equal to three times the rated heater voltage divided by the rated heater current.

The **8HR** basing arrangement 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
- **Recessed Cap:** Anode (Grid No. 3, Grid No. 5, Screen)

In this configuration, Grid No. 1 is internally connected to both Pin 2 and Pin 6. Base Pin No. 4 is aligned within 30 degrees of the vertical centerline of the tube and is positioned on the same side of the neck as

the anode contact cap (J1-21). The reference line of the bulb is determined by the plane C-C' of a JEDEC No. 126 Reference Line Gauge when it is seated against the bulb.

Electrical Characteristics and Capacitances

The electrical design of the 16BEP4 includes an external conductive coating that must be grounded in operation. This coating, in combination with the internal conductive anode coating, forms a capacitor that assists in high-voltage filtering. The direct interelectrode capacitances are approximately:

- **Cathode to All Other Electrodes:** 5 pF
- **Grid No. 1 to All Other Electrodes:** 6 pF
- **External Conductive Coating to Anode:** 1200 pF (Maximum), 800 pF (Minimum)

The deflection system is magnetic, with approximate deflection angles as follows:

- **Horizontal Deflection Angle:** 103 degrees
- **Diagonal Deflection Angle:** 114 degrees
- **Vertical Deflection Angle:** 88 degrees

Typical Operating Conditions (Cathode Drive Service)

In typical Cathode Drive Service, all voltages are specified as positive with respect to Grid No. 1, unless otherwise indicated. Under these conditions, the electrostatic focusing electrode (Grid No. 4) is operated at a low voltage relative to the anode:

- **Anode Voltage:** 14,000 Volts dc
- **Grid No. 4 Voltage for Focus:** 0 to 400 Volts dc
- **Grid No. 2 Voltage:** 50 Volts dc
- **Cathode Voltage Required for Cutoff:** +30 to +48 Volts dc

The cutoff voltage range is specified for the visual extinction of a focused raster. For the cutoff of an undeflected focused spot, the absolute value of the bias between the cathode and Grid No. 1 increases by approximately 5 volts (resulting in a cutoff range of +35 to +53 Volts).

Maximum Ratings and Circuit Limits

The 16BEP4 is rated under the Design Maximum Rating System. Operating the tube within these limits is necessary to ensure reliable performance and prevent premature failure.

Cathode Drive Service Ratings

- **Anode Voltage:**
 - **Maximum:** 18,000 Volts dc
 - **Minimum:** 10,000 Volts dc
- **Grid No. 4 Voltage (Focusing Electrode):** -400 to +1250 Volts dc
- **Grid No. 2 Voltage:** 70 Volts dc

- **Cathode Voltage:**
 - **Positive Bias Value:** 100 Volts dc
 - **Positive Peak Value:** 150 Volts
 - **Negative Bias Value:** 0 Volts dc
 - **Negative Peak Value:** 2 Volts
- **Peak Heater-Cathode Voltage:**
 - **Heater Negative with Respect to Cathode:**
 - **During Warm-up Period (not to exceed 15 seconds):** 450 Volts
 - **After Equipment Warm-up Period:** 200 Volts
 - **Heater Positive with Respect to Cathode:** 200 Volts

Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 Megohms (Maximum)

X-Ray Radiation Warning

When operating the 16BEP4, safety precautions regarding X-ray radiation must be observed. If the tube is operated at voltages higher than the manufacturer's Maximum Rated Anode Voltage (18,000 Volts) or 16,000 Volts, whichever is less, X-ray radiation shielding may be necessary. This shielding is required to protect against the potential danger of personal injury resulting from prolonged exposure at close range.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	18000 V	—
Typical Anode Voltage	14000 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	P4	—
Focusing Method	Electrostatic	—
Deflecting Method	Magnetic	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1965 Sylvania Electronic Tubes Vol3

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

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	300 mA	—
Focusing Method	Electrostatic text	—
Deflection Method	Magnetic text	—
Fluorescence	White text	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Persistence	Medium Short text	—
Phosphor	Aluminized P4 text	—
Horizontal Deflection Angle	103 deg	Approximate
Vertical Deflection Angle	88 deg	Approximate
Diagonal Deflection Angle	114 deg	Approximate
Light Transmittance	60 percent	Approximate

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	18000 V	CathodeDrive
Minimum Anode Voltage	10000 V	CathodeDrive
Focus Voltage Minimum	-400 V	Grid4
Focus Voltage Maximum	1250 V	Grid4
Maximum Grid2 Voltage	70 V	CathodeDrive
Maximum Cathode Positive Bias	100 V	—
Maximum Cathode Positive Peak	150 V	—
Anode Voltage	14000 V	CathodeDrive
Focus Voltage Minimum	0 V	Grid4
Focus Voltage Maximum	400 V	Grid4
Grid2 Voltage	50 V	CathodeDrive
Cathode Cutoff Voltage Minimum	30 V	CathodeDrive
Cathode Cutoff Voltage Maximum	48 V	CathodeDrive
Maximum Grid1 Circuit Resistance	1.5 Mohm	—

TUBE TINKER

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