

Twelve-inch cathode-ray display tube with electrostatic focusing and magnetic deflection. The P14 screen produces blue-purple fluorescence with medium-long persistence; the tube is a high-voltage direct-view CRT suited to instrument and display applications.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	13200 V
Cathode-ray display/electron-gun section.	

12ABP14A — Electrostatic Focus Cathode-Ray Tube

The 12ABP14A is a 12-inch, direct-viewed, round glass cathode-ray tube designed for special-purpose display applications. It features a spherical faceplate, magnetic deflection, and electrostatic focusing capabilities. The tube is characterized by its specialized screen and electrical design, which optimize image definition and brilliance under high-voltage operating conditions.

Screen and Phosphor Characteristics

The 12ABP14A is equipped with an aluminized screen utilizing P14 phosphor. This configuration provides specific optical characteristics:

- **Fluorescence:** Purple
- **Phosphorescence:** Yellow
- **Persistence:** Medium-Long

The "A" suffix in the 12ABP14A designation indicates the presence of an aluminized screen. This distinguishes it from the standard [12ABP14](#), which does not feature aluminization. Both types are otherwise identical in their electrical and mechanical specifications.

The faceplate is constructed from gray filter glass to enhance contrast, offering a light transmittance of approximately 74 percent.

Mechanical Design and Physical Dimensions

The mechanical structure of the 12ABP14A is designed to support high-voltage operation and precise physical alignment within display equipment:

- **Overall Length:** $18 \pm 3/8$ inches
- **Maximum Bulb Diameter:** $12 \frac{1}{2} \pm 1/8$ inches
- **Minimum Useful Screen Diameter:** 11 inches
- **Neck Diameter:** $1 \frac{7}{16} \pm 1/16$ inches
- **Faceplate Curvature:** Spherical with a 40-inch radius
- **Deflection Angle:** Approximately 55 degrees
- **Base:** Small Shell Duodecal 6-Pin (B6-63), configured for a 12M basing arrangement
- **Bulb Contact:** Recessed Small Cavity Cap (J1-21)

The anode bulb contact is positioned $10 \frac{1}{8} \pm 3/16$ inches from the faceplate and aligns with the vacant pin position No. 3 within a tolerance of ± 10 degrees. The reference line, which serves as a physical datum point, is defined as the position where a ring gauge with a 1.500-inch (+0.003, -0.000) internal diameter and a length of 2 inches will stop.

An anti-corona coating is applied to the bulb, concentric with the anode contact, extending to a minimum radius of 1-1/2 inches. To prevent damage or degradation of this protective layer, the tube must not be handled by the portion of the bulb carrying the anti-corona coating.

Electrical Specifications and Maximum Ratings

The electrical design of the 12ABP14A requires careful regulation of heater and electrode potentials. The nominal heater ratings and interelectrode capacitances are:

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** $0.6 \pm 10\%$ Ampere
- **Cathode to All Other Electrodes Capacitance:** Approximately 5 pF
- **Grid No. 1 to All Other Electrodes Capacitance:** Approximately 6 pF

Heater Power Calculation: Using the nominal heater voltage (6.3 V) and nominal heater current (0.6 A), the nominal heater power consumption is calculated as: $6.3 \text{ V} * 0.6 \text{ A} = 3.78 \text{ Watts}$

The absolute maximum ratings (under the Absolute Maximum system) define the safe operating limits for the tube:

- **Anode Voltage:** 13,200 Volts dc
- **Grid No. 4 (Focusing Electrode) Voltage:** -550 to +1100 Volts dc
- **Grid No. 2 Voltage:** 770 Volts dc
- **Grid No. 1 Voltage (Negative Bias Value):** 200 Volts dc
- **Grid No. 1 Voltage (Positive Bias Value):** 0 Volts dc
- **Grid No. 1 Voltage (Positive Peak Value):** 0 Volts
- **Peak Heater-Cathode Voltage (Heater Negative with respect to Cathode):** 200 Volts dc
- **Peak Heater-Cathode Voltage (Heater Positive with respect to Cathode):** 200 Volts dc
- **Grid No. 1 Circuit Resistance:** 1.5 Megohms maximum

Typical Operating Conditions and Adjustments

For standard operation, the tube is typically set to the following operating points:

- **Anode Voltage:** 10,000 Volts dc
- **Grid No. 4 Voltage for Focus:** 0 to 300 Volts dc
- **Grid No. 2 Voltage:** 300 Volts dc
- **Grid No. 1 Voltage for Cutoff:** -28 to -72 Volts dc
- **Alignment Magnet Field Strength:** 0 to 4 Gauss

To achieve optimum performance, several adjustments and circuit considerations must be observed:

- **Anode Voltage Limits:** Operating the tube below 8,000 Volts is generally not recommended, as both brilliance and image definition decrease with lower anode voltages.
- **Focus Adjustment:** Grid No. 4 voltage is adjusted to obtain the best overall focus of a 7-1/2" x 10" raster pattern when Grid No. 1 is set to produce an anode current of 100 microamperes.
- **Spot Cutoff:** The specified Grid No. 1 cutoff voltage range (-28 to -72 Volts) applies to the visual extinction of a focused raster. Extinguishing a stationary focused spot requires approximately 5 Volts more negative bias (resulting in a range of -33 to -77 Volts).
- **Beam Alignment:** For optimal spot quality, an adjustable beam alignment magnet with a strength of 0 to 4 Gauss should be positioned approximately 5 15/16 inches from the reference line.
- **Anode Input Power:** When operating at or near maximum ratings, the effective resistance of the anode supply must be sufficient to limit the total anode input power to 6 watts.

Safety and Radiation Precautions

Because the 12ABP14A operates at high voltages, specific safety measures are required:

- **X-ray Radiation:** If the tube is operated at voltages higher than its maximum rated anode voltage (13,200 Volts) or 16,000 Volts (whichever is less), X-ray radiation shielding may be necessary to protect personnel from prolonged exposure at close range. Given the maximum rating of 13,200 Volts, shielding considerations become relevant if this limit is exceeded.

- **Handling:** Physical handling must avoid contact with the anti-corona coating area to prevent contamination or damage to the high-voltage insulation.

Technical Summary

The 12ABP14A is a specialized 12-inch round glass cathode-ray tube featuring electrostatic focus, magnetic deflection, and an aluminized screen with P14 phosphor (purple fluorescence, yellow phosphorescence, medium-long persistence). Operating with a 6.3 V, 0.6 A heater, it supports anode voltages up to 13,200 V dc and utilizes a B6-63 duodecal base. Proper operation requires careful adjustment of the focusing electrode (Grid No. 4), the use of an external beam alignment magnet, and adherence to strict handling and radiation safety protocols.



SOURCE OPERATING CONDITIONS

1960 Du Mont

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

1960 DU MONT

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	600 mA	—
Focusing Method	Electrostatic text	—
Deflection Method	Magnetic text	—
Phosphor	P14 text	—
Fluorescence	Blue/purple text	—
Persistence	Medium-long text	—
Deflection Angle	55 deg	Approximate
Screen Construction	Aluminized/metal-backed text	—



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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—
Anode voltage maximum	13200 V	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No. 2 voltage maximum	770 V	—
Grid No. 1 negative bias maximum	200 V	—
Heater-cathode peak voltage	200 V	—

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes, and their source documents.

[Catalog](#)
[Tube types](#)
[Full books](#)
[Blog](#)
[Feedback & corrections](#)

© 2026 Tube Tinker