



ELECTRONIC TUBE REFERENCE

14QP4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Cathode-ray display tube documented with approximately 110-degree deflection; available manufacturer extraction is otherwise sparse, so no narrower application claim is assigned.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12L	BASE PINS	6
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 0	Cathode Ray
MAXIMUM PLATE VOLTAGE	11000 V
<i>Design-center maximum anode voltage 11 kV.</i>	

14QP4A — Electrostatic-Focus Magnetic-Deflection Cathode-Ray Tube

The **14QP4A** is a 14-inch rectangular all-glass cathode-ray picture tube designed for direct-view television applications. It features electrostatic focusing and magnetic deflection, utilizing a short neck design for cabinet space economy. The tube is equipped with a gray-tinted faceplate to enhance picture contrast, an aluminized fluorescent screen to maximize light output, and an external conductive coating that acts as a filter capacitor when properly grounded. The 14QP4A is identical to the [14QP4](#) except for the addition of the aluminized screen.

Mechanical Specifications and Physical Construction

The physical envelope of the 14QP4A is designated as bulb number J109-1/2 C7 (or J109-1/2 C). The tube is designed to be mounted in any position and has an approximate net weight of 10 pounds.

Physical Dimensions

- **Over-all Length:** $16\frac{5}{32} \pm \frac{3}{8}$ inches
- **Neck Length:** $6\frac{7}{8}$ inches
- **Greatest Bulb Dimensions:**
 - Diagonal: $13\frac{11}{16} \pm \frac{1}{8}$ inches
 - Width: $12\frac{19}{32} \pm \frac{1}{8}$ inches
 - Height: $9\frac{3}{4} \pm \frac{1}{8}$ inches
- **Minimum Useful Screen Dimensions:**
 - Diagonal: 12-1/2 inches
 - Width: 11-3/8 to 11-1/2 inches
 - Height: 8-1/2 to 8-5/8 inches
 - Minimum Useful Area: 96 square inches

Tube Connections and Alignment

The tube utilizes a small-shell Duodecal 6-pin base (JETEC No. B6-63) with a 12L basing configuration. The high-voltage anode connection is made via a recessed small-cavity cap (JETEC No. J1-21). The anode terminal is aligned such that it is positioned within ± 30 degrees of Pin No. 6.

Electrical and Optical Characteristics

Heater and Capacitances

The 14QP4A features an indirectly heated cathode with the following electrical characteristics:

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.6 A (with a tolerance of $\pm 5\%$ or $\pm 10\%$)
- **Heater Warm-up Time:** 11 seconds

Direct interelectrode capacitances are approximately:

- **Cathode to All Other Electrodes:** 5 μF
- **Grid-No. 1 to All Other Electrodes:** 6 μF
- **External Conductive Coating to Anode:** 600 μF minimum to 900 μF maximum

Within the tube, the anode, Grid-No. 3, and Grid-No. 5 are connected together internally and are collectively referred to as the anode.

Optical Properties

The tube is constructed with a gray filter glass faceplate that provides a light transmission at the center of approximately 74% to 76%. The screen uses a P4 sulfide-type phosphor with the following characteristics:

- **Fluorescent Color:** White
- **Phosphorescent Color:** White
- **Persistence:** Short

Operating Conditions and Ion-Trap Requirements

Typical Operating Points

Under typical operating conditions, the voltages (measured with respect to the cathode) and currents are as follows:

- **Anode Voltage:** 9,000 V DC
- **Grid-No. 2 Voltage:** 250 V DC
- **Focusing-Electrode (Grid-No. 4) Voltage for Focus:** -50 to +250 V DC
- **Focusing-Electrode Current:** -15 to +25 μ A DC
- **Grid-No. 1 Voltage (for visual extinction of focused raster):** -24 to -64 V DC

Ion-Trap Magnet

The 14QP4A requires an external, single-field ion-trap magnet adjusted to the optimum position. The magnetic field requirements are:

- **Field Intensity / Strength:** 24 Gauss minimum or 27 Gauss for a typical permanent magnet (PM) ion-trap magnet.
- **Ion-Trap Magnet Current:** Approximately 24 mA (when using an electromagnetic ion-trap magnet such as the RETMA No. 117).

Maximum Ratings and Circuit Values

The maximum ratings for the 14QP4A are defined under both the Design-Center system and the Absolute Maximum system. The Design-Center system provides a ten-percent safety factor, allowing the tube to withstand variations in line voltage and components up to ten percent above the design-center limits.

Comparative Maximum Ratings

Parameter	Design-Center Maximum	Absolute Maximum
Anode Voltage	11,000 V DC	12,100 V DC
Focusing-Electrode Voltage	-500 to +1,000 V DC	-550 to +1,100 V DC
Grid-No. 2 Voltage	500 V DC	550 V DC

Parameter	Design-Center Maximum	Absolute Maximum
Grid-No. 1 Negative-Bias Value	180 V DC	155 V DC
Grid-No. 1 Negative-Peak Value	—	220 V
Grid-No. 1 Positive-Bias Value	0 V DC	0 V DC
Grid-No. 1 Positive-Peak Value	2 V	2 V
Peak Heater-Cathode Voltage (Heater negative, warm-up ≤ 15s)	410 V	450 V
Peak Heater-Cathode Voltage (Heater negative, after warm-up)	180 V	200 V
Peak Heater-Cathode Voltage (Heater positive)	180 V	200 V

Circuit Resistance Limits

- **Grid-No. 1 Circuit Resistance:** 1.5 Megohms maximum
- **Grid-No. 2 Circuit Resistance:** 0.1 Megohms minimum
- **Focusing-Electrode Circuit Resistance:** 0.1 Megohms minimum

To prevent damage to the tube, it is advisable to include protective resistance in the Grid-No. 2 and focusing electrode circuits. If applicable, a single resistor common to both circuits may be used.

X-ray Radiation Warning

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if the tube is operated at voltages higher than the manufacturer's Maximum Rated Anode Voltage or 16,000 volts, whichever is less.

Technical Summary

The **14QP4A** is a 14-inch rectangular, electrostatic-focus, magnetic-deflection cathode-ray tube featuring a short neck, an aluminized P4 sulfide-type white phosphor screen, and a gray filter glass faceplate with 74% to 76% light transmission. Operating typically at an anode voltage of 9,000 V DC and a Grid-No. 2 voltage of 250 V DC, it provides a minimum useful screen area of 96 square inches. The tube requires an external single-field ion-trap magnet and utilizes a small-shell Duodecal 6-pin base with a 12L basing configuration. Designers must adhere to the specified circuit resistance limits and maximum ratings (up to 11,000 V DC Design-Center or 12,100 V DC Absolute Maximum) to ensure safe and reliable operation, including implementing X-ray shielding if operating limits are exceeded.



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 0 · Cathode Ray

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Deflection Angle	110 deg	Approximate

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