



ELECTRONIC TUBE REFERENCE

10DP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Cathode-ray display tube documented by General Electric; the available source contains insufficient extracted technical detail to support a more specialized functional description.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	12
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

No fixed ratings recorded.

CRT anode/focus/deflection data are preserved in parameters rather than forced into ordinary plate/screen fields.

10DP4 — Electrostatic-Focus Cathode-Ray Picture Tube

The **10DP4** is a ten-inch cathode-ray picture tube designed specifically for direct-view television receiver applications. It features a semi-flat faceplate and incorporates electrostatic focusing alongside magnetic deflection. A key design feature of this tube is its metal-backed screen, which is engineered to prevent screen burning caused by ions while simultaneously increasing overall screen brightness. The electrostatic focusing system is designed to operate without requiring any appreciable focus current.

Mechanical Design and Physical Dimensions

The 10DP4 is constructed with a glass bulb envelope and a specialized screen assembly. The physical dimensions and mechanical designations are tightly specified to ensure proper mounting and alignment within television chassis:

- **Overall Length:** $17 \frac{5}{8} \pm \frac{3}{8}$ inches
- **Greatest Diameter of Bulb:** $10 \frac{1}{2} \pm \frac{1}{8}$ inches
- **Minimum Useful Screen Diameter:** 9 inches
- **Bulb Contact Designation:** J1-21 (recessed small-cavity cap)
- **Base Designation:** Small-shell Duodecal 7-Pin
- **Basing Configuration:** [12C](#)

The tube's reference line is determined by the position where a standardized gage, measuring 1.500 inches (+0.003" / -0.000") in diameter and 2 inches in length, rests on the bulb cone. The anode terminal is a recessed small-cavity cap located on the side of the bulb cone, with a maximum angular deviation of 10 degrees from its nominal radial position.

Heater and General Electrical Characteristics

The 10DP4 utilizes an indirectly heated cathode. The electrical requirements and nominal characteristics of the electron gun and deflection systems are as follows:

Parameter	Specification
Heater Voltage	$6.3 \pm 10\%$ Volts
Heater Current	$0.6 \pm 10\%$ Amperes
Focusing Method	Electrostatic
Deflecting Method	Magnetic
Maximum Deflecting Angle	50 Degrees
Phosphor Type	P4
Fluorescence Color	White
Phosphor Persistence	Medium

Nominal Interelectrode Capacitances

- **Cathode to All Other Electrodes:** $6 \mu\text{F}$ (pF)
- **Grid No. 1 to All Other Electrodes:** $10 \mu\text{F}$ (pF)

A calculation of the nominal heater power consumption based on the rated voltage and current values ($6.3 \text{ V} * 0.6 \text{ A}$) yields 3.78 Watts.

Basing and Pin Connections

The 10DP4 uses a Small-shell Duodecal 7-Pin base with a 12C basing arrangement. The pin connections, viewed from the bottom of the base, are assigned as follows:

Pin Number	Connection
1	Heater
2	Grid No. 1
6	Anode No. 1
7	No Connection (N.C.)
10	Grid No. 2
11	Cathode
12	Heater

Note: The position for Pin 3 is vacant. The high-voltage Anode No. 2 connection is made via the recessed small-cavity cap on the bulb cone.

Maximum Ratings (Design Center Values)

The following maximum ratings are established under the Design Center system. Operating the tube beyond these limits may impair performance or cause permanent damage:

- **Anode No. 2 Voltage:** 10,000 Max Volts D-C
- **Anode No. 1 Voltage:** 3,600 Max Volts D-C
- **Grid No. 2 Voltage:** 410 Max Volts D-C
- **Grid No. 1 Voltage:**
 - *Negative-Bias Value:* 150 Max Volts D-C
 - *Positive-Bias Value:* 0 Max Volts D-C
 - *Positive-Peak Value:* 2 Max Volts
- **Peak Heater-Cathode Voltage:**
 - *Heater Negative with Respect to Cathode (After equipment warm-up period):* 125 Max Volts D-C
 - *Heater Positive with Respect to Cathode (At any time):* 125 Max Volts D-C
 - *Heater Negative with Respect to Cathode (During equipment warm-up period not to exceed 15 seconds):* 410 Max Volts D-C

Typical Operating Conditions and Circuit Values

For standard television receiver service, the typical operating parameters are defined at a nominal Anode No. 2 potential of 9,000 Volts D-C. Under these conditions, the focusing and grid bias voltages are adjusted as follows:

- **Anode No. 2 Voltage:** 9,000 Volts D-C
- **Anode No. 1 Voltage (Focusing Electrode):** 2,550 to 3,250 Volts D-C
- **Grid No. 2 Voltage:** 250 Volts D-C
- **Grid No. 1 Voltage (for visual extinction of undeflected focused spot):** 36 to 84 Volts D-C
- **Undeflected Spot Position:** 16 Max Millimeters (maximum displacement from the physical center of the screen)

Maximum Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 Max Megohms

To ensure proper biasing and minimize potential differences, the cathode should be returned directly to one side or to the center-tap (mid-tap) of the heater transformer winding.

Technical Summary

The **10DP4** is a specialized ten-inch, electrostatic-focus, magnetic-deflection cathode-ray tube designed for direct-view television applications. By combining electrostatic focusing—which eliminates the need for focus current—with a metal-backed P4 white phosphor screen, the tube provides high brightness while protecting the screen from ion-burn damage. Operating at a typical Anode No. 2 voltage of 9,000 V D-C, the tube utilizes a 6.3 V heater and is housed in a Small-shell Duodecal 7-Pin base ([12C](#) configuration). Its design limits and operating parameters are optimized for stable, high-voltage performance in early television receiver designs.