

ELECTRONIC TUBE REFERENCE

12LP4C

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Twelve-inch round P4 television picture tube with magnetic focusing and deflection. The gray-filter, aluminized screen and double-field ion-trap arrangement support high-contrast direct viewing at typical anode operation around 11 kV.

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	12000 V
Published maximum ratings and characteristics promoted semantically from the approved source.	

12LP4C — Television Picture Tube

A 12-inch direct-viewed, round glass cathode-ray tube featuring magnetic deflection, magnetic focus, an aluminized screen, and a gray filter glass faceplate designed for monochrome television receivers.

Overview

The **12LP4C** is a specialized television picture tube designed for direct-view applications. It utilizes magnetic deflection with an approximate deflecting angle of 54 degrees, alongside magnetic focusing. The tube incorporates an aluminized screen with P4 phosphor, which produces a white fluorescence with medium persistence. To enhance picture contrast under ambient lighting conditions, the tube features a gray filter glass faceplate with an approximate light transmittance of 74 percent. Additionally, the 12LP4C

is designed to operate with an external, double-field type ion trap magnet and includes an external conductive coating that must be grounded during operation.

Construction and Physical Characteristics

The 12LP4C is constructed with a round glass bulb envelope. The physical dimensions and mechanical features of the tube include:

- **Overall Length:** 18 3/4 ± 3/8 inches
- **Neck Diameter:** 1 7/16 ± 1/16 inches
- **Minimum Useful Screen Diameter:** 11 inches
- **Bulb Contact:** Recessed small cavity cap (designated J1-21)
- **Base:** Small shell duodecal 5-pin base (designated B5-57)
- **Basing Configuration:** 12N

The recessed small cavity cap, which serves as the anode contact, aligns with the vacant pin position No. 3 of the base within a tolerance of ±10 degrees. The reference line of the tube is determined by the plane of the upper edge of a standard JETEC No. 112 reference line gauge when the gauge is resting directly on the glass cone.

To facilitate proper circuit operation and shielding, the tube features an external conductive coating. This coating must be grounded. The capacitance formed between the external conductive coating and the internal anode ranges from a minimum of 750 µF to a maximum of 3000 µF.

Heater and Electrical Connections

The 12LP4C contains an indirectly heated cathode. The electrical requirements for the heater and the direct interelectrode capacitances are as follows:

Parameter	Value
Nominal Heater Voltage	6.3 V
Nominal Heater Current	0.6 A (±10%)
Cathode to All Other Electrodes Capacitance	5 µF
Grid No. 1 to All Other Electrodes Capacitance	6 µF

The 12N basing arrangement provides the following pin connections, viewed from the bottom of the base:

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 10:** Grid No. 2
- **Pin 11:** Cathode
- **Pin 12:** Heater
- **Recessed Cavity Cap (J1-21):** Anode

Operating Conditions and Electrical Characteristics

Under typical operating conditions, the 12LP4C is configured with the following parameters:

- **Anode Voltage:** 11,000 Volts DC
- **Grid No. 2 Voltage:** 250 Volts DC
- **Grid No. 1 Voltage Required for Cutoff:** -27 to -63 Volts DC (defined at the point of visual extinction of an undeflected focused spot)
- **Focusing Coil Current:** Approximately 110 mA DC
- **Ion Trap Magnet Strength:** Approximately 35 Gauss

The specified focusing coil current of 110 mA DC is applicable when using a JETEC focusing coil 106 (or equivalent) positioned three and one-quarter inches from the reference line. This current is determined with the bias adjusted to 20 foot-lamberts on a 7 1/2 x 10 inch picture area sharply focused at the center of the screen.

Maximum Ratings and Safety Considerations

The maximum ratings for the 12LP4C are established under the Design Center system. Operating the tube beyond these limits can result in degraded performance or permanent damage.

Parameter	Maximum Rating
Anode Voltage	12,000 V DC
Grid No. 2 Voltage	410 V DC
Grid No. 1 Negative Bias Value	125 V DC
Grid No. 1 Positive Bias Value	0 V DC
Grid No. 1 Positive Peak Value	2 V
Grid No. 1 Circuit Resistance	1.5 MΩ

Heater-Cathode Voltage Limits

The peak heater-cathode voltage limits are highly dependent on the polarity of the heater relative to the cathode and the operating state of the equipment:

- **Heater Negative with Respect to Cathode:**
 - During the warm-up period (not to exceed 15 seconds): **410 Volts**
 - After the equipment warm-up period: **140 Volts**
- **Heater Positive with Respect to Cathode: 140 Volts**

X-Ray Radiation Warning

When operating the 12LP4C, appropriate safety precautions must be taken regarding X-ray exposure. X-ray radiation shielding may be necessary to protect against the danger of personal injury from prolonged exposure at close range if the tube is operated at voltages higher than the maximum rated anode voltage of 12,000 Volts, or 16,000 Volts, whichever is less.

Technical Summary

The **12LP4C** is a 12-inch round glass television picture tube utilizing magnetic deflection and magnetic focus. It features a 6.3 V, 0.6 A heater, a small shell duodecal 5-pin base with a 12N basing configuration, and a recessed small cavity cap for the high-voltage anode connection. The tube is characterized by an aluminized P4 screen producing white fluorescence, a gray filter glass faceplate with 74% transmittance, and an external conductive coating that must be grounded. It is rated for a maximum anode voltage of 12,000 V DC and typically operates at 11,000 V DC with a Grid No. 2 voltage of 250 V DC, requiring an external double-field ion trap magnet of approximately 35 Gauss and a focusing coil current of approximately 110 mA DC.



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	12000 V	—
Typical Anode Voltage	11000 V	—

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

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