

ELECTRONIC TUBE REFERENCE

# 12VP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION  
CONSTRUCTION  
CATHODERAY

Twelve-inch P4 television picture tube with magnetic focusing and magnetic deflection. The high-voltage direct-view CRT uses a white picture screen and conventional magnetic beam control for monochrome television presentation.

## 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. |         |

## 12VP4 — Twelve-Inch Cathode-Ray Picture Tube

A twelve-inch magnetic-focus and magnetic-deflection direct-view picture tube designed for television receiver applications.

### Overview

The **12VP4** is a direct-view cathode-ray tube featuring a twelve-inch bulb diameter. It is designed with an electron gun of triode construction that requires an external ion-trap magnet for proper operation. The tube utilizes magnetic focusing and magnetic deflection, with an approximate deflecting angle of 55 degrees. To assist in circuit operation, the bulb is manufactured with an external conductive coating.

The screen uses a #4 phosphor, which provides a white fluorescence and a medium persistence. This combination is optimized for displaying black-and-white television pictures.

## Mechanical Specifications and Basing

The physical dimensions and mechanical characteristics of the 12VP4 are precisely defined for television chassis integration:

- **Overall Length:** 18 ± 3/8 inches
- **Greatest Diameter of Bulb:** 12 7/16 inches (with a tolerance of +1/16 to -1/8 inches)
- **Minimum Useful Screen Diameter:** 11 inches
- **Bulb Contact:** J1-21 Recessed Small Cavity Cap
- **Base:** B5-57 Small Shell Duodecal 5-Pin
- **Basing Designation:** 12G

## Pinout Configuration

The electrical connections are made through the 5-pin duodecal base and the recessed cavity cap on the bulb. The pin assignments, viewed from the bottom of the base, are as follows:

| Pin / Contact | Connection    |
|---------------|---------------|
| Pin 1         | Heater        |
| Pin 2         | Grid          |
| Pin 10        | No Connection |
| Pin 11        | Cathode       |
| Pin 12        | Heater        |
| Bulb Contact  | Anode         |

Pin position number 3 is vacant. The bulb contact (anode) is aligned with vacant pin position number 3 within a tolerance of ±10 degrees. An uncoated surface area with a diameter of 4 1/4 inches is maintained around the bulb contact on the cone. The reference line of the tube is established by the position where a ring gauge with an inside diameter of 1.500 inches (+0.003 inches, -0.000 inches) and a length of 2 inches rests on the bulb cone.

## Electrical Characteristics and Operating Conditions

The 12VP4 operates with an indirectly heated cathode. The electrical characteristics of the heater and the typical operating parameters of the tube are:

- **Heater Voltage:** 6.3 volts
- **Heater Current:** 0.6 ± 10% amperes
- **Capacitance (External Conductive Coating to Anode):** 750 µpf minimum, 3,000 µpf maximum

## Typical Operating Points

Under typical operating conditions, the tube is configured with the following electrical parameters:

- **Anode Voltage (dc):** 11,000 volts
- **Grid Voltage for Cut-Off (dc):** -33 to -77 volts
- **Maximum Grid #1 Circuit Resistance:** 1.5 megohms

## Maximum Ratings

The maximum ratings for the 12VP4 are specified under the Design Center system. Operating the tube beyond these limits may degrade performance or cause permanent damage to the structure.

- **Anode Voltage (dc):** 12,000 volts maximum
- **Grid Voltage:**
  - Negative-Bias (dc): 125 volts maximum
  - Positive-Bias (dc): 0 volts maximum
  - Positive Peak: 2 volts maximum
- **Peak Heater-Cathode Voltage:**
  - *Heater Negative with Respect to Cathode during Warm-Up Period:* 410 volts maximum (not to exceed 15 seconds)
  - *Heater Negative with Respect to Cathode after Warm-Up Period:* 125 volts maximum
  - *Heater Positive with Respect to Cathode:* 125 volts maximum

To protect the heater-cathode insulation, the peak negative heater voltage is permitted to reach 410 volts only during the initial warm-up phase, which must not exceed 15 seconds. Under normal operating conditions after warm-up, the potential difference between the heater and cathode must be kept within 125 volts in either polarity.

## Technical Summary

The **12VP4** is a twelve-inch, magnetic-focus, magnetic-deflection cathode-ray tube designed for direct-view television applications. It features a triode electron gun designed for use with an external ion-trap magnet, an external conductive coating, and a white-emitting #4 phosphor of medium persistence. Operating with a nominal 6.3 V, 0.6 A heater, the tube is typically operated at an anode voltage of 11,000 V, with a maximum design-center rating of 12,000 V. It is constructed with a J1-21 recessed small cavity cap for the anode connection and a B5-57 small shell duodecal 5-pin base.



## 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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