

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

16VP4

1 SECTION
CONSTRUCTION
CATHODERAY

Specialized - Cathode Ray electronic tube

P4 cathode-ray display tube documented for high-voltage direct-view operation, using magnetic deflection and manufacturer-specified beam focusing and control arrangements appropriate to type 16VP4.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	5
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	15000 V
MAXIMUM SCREEN VOLTAGE	41 V
CRT-specific anode, focus, deflection and optical data retained as parameters rather than forced into ordinary plate/screen fields.	

16VP4 — Direct-View Cathode Ray Picture Tube

The **16VP4** is a direct-view cathode ray picture tube designed primarily for television receiver applications. It features a round glass construction, a grey filter faceplate, and utilizes magnetic methods for both focusing and deflection. The tube incorporates an indirectly heated unipotential cathode and requires an external single-field ion trap magnet for proper operation.

Mechanical Design and Physical Dimensions

The 16VP4 is constructed with a round glass bulb having a greatest diameter of 15 7/8 ± 1/8 inches and a minimum useful screen diameter of 14 1/2 inches. The overall length of the tube is 17 3/16 ± 3/8 inches.

The electrical connection to the anode is made via a recessed small cavity cap (designated J1-21) located on the bulb cone. This bulb contact is aligned with pin position 3 on the base within a tolerance of ± 10 degrees. The distance from the reference line to the center of the anode terminal is 10 5/16 inches, and the distance from the reference line to the anode cap is 3 1/16 inches.

The tube neck has a diameter of $1 \frac{7}{16} \pm \frac{1}{16}$ inches. A space of 4 5/8 inches along the neck, measured from the reference line toward the base, must be kept clear to accommodate the external ion trap magnet. The base is a small shell duodecal 5-pin type (designation B5-57), which employs the [12D](#) basing configuration.

Electrical Connections and Pinout

The [12D](#) basing arrangement provides the following pin connections, viewed from the bottom of the tube base:

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

The heater is designed to operate on a nominal supply of 6.3 volts (AC or DC) and draws a nominal current of 0.6 amperes.

Optical and Screen Characteristics

The 16VP4 is equipped with a grey filter faceplate that has an approximate light transmission of 70 percent at the center, which helps improve picture contrast under ambient light. The screen characteristics are defined as follows:

- **Phosphor Number:** No. 4
- **Fluorescent Color:** White
- **Phosphorescent Color:** White
- **Persistence:** Medium
- **Raster Size:** 10 1/8 inches by 14 1/2 inches (also specified as a picture size of 10 1/4 inches by 14 1/2 inches under typical operating conditions)

Maximum Ratings (Design Center Values)

The maximum ratings for the 16VP4 are established under the design center system. These limits must not be exceeded under the worst-case operating conditions:

- **Maximum DC Anode Voltage:** 15,000 Volts
- **Maximum DC Grid No. 2 Voltage:** 410 Volts
- **Maximum Grid No. 1 Voltage:**
 - *DC Negative-Bias Value:* 125 Volts
 - *DC Positive-Bias Value:* 0 Volts
 - *Positive-Peak Value:* 2 Volts
- **Maximum DC Peak Heater-Cathode Voltage:**
 - *Heater Negative with Respect to Cathode (during warm-up period ≤ 15 seconds):* 410 Volts
 - *Heater Negative with Respect to Cathode (after equipment warm-up):* 125 Volts
 - *Heater Positive with Respect to Cathode:* 125 Volts

Additionally, the maximum grid No. 1 circuit resistance is limited to 1.5 megohms.

Typical Operating Conditions and Characteristics

Under typical operating conditions, the 16VP4 is configured with the following electrical parameters:

- **DC Anode Voltage:** 12,000 Volts
- **DC Grid No. 2 Voltage:** 250 Volts
- **DC Grid No. 1 Voltage (for visual extinction of undeflected focused spot):** -27 to -63 Volts
- **DC Focusing Coil Current (approximate):** 110 mA
- **DC Ion Trap Current (approximate):** 120 mA

The focusing coil current of approximately 110 mA is specified using a standard focus coil #109 (or equivalent), with the combined grid No. 1 bias voltage and video signal voltage adjusted to produce a highlight brightness of 20 foot-lamberts on a 10 1/4" by 14 1/2" picture size. For this operating point, the distance from the reference line to the center of the air gap on the focus coil is specified as 3.0 inches. The ion trap current of approximately 120 mA is specified using a standard coil #111.

Technical Summary

The **16VP4** is a 70-degree magnetic deflection, magnetic focus cathode ray picture tube designed for television service. It features a 15 7/8-inch round glass bulb, a grey filter faceplate with 70% light transmission, and a No. 4 white phosphor screen. Operating with a 6.3 V, 0.6 A heater, the tube is rated for a maximum DC anode voltage of 15,000 V and a typical operating anode voltage of 12,000 V. It utilizes a small shell duodecal 5-pin base ([12D](#) basing) and requires an external single-field ion trap magnet and a standard focusing coil to produce a clear, focused raster.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 Tung Sol

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

1961 TUNG SOL

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	15000 V	—
Typical Anode Voltage	12000 V	—
Maximum Grid2 Voltage	410 V	—
Typical Grid2 Voltage	250 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
FocusingMethod	Magnetic	—
DeflectingMethod	Magnetic	—
DiagonalDeflectionAngleApproximate	70 degree	—
PhosphorNumber	4	—
FluorescentColor	White	—
Persistence	Medium	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1966 Tung Sol Electronic Tubes 4 of 4

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

1966 TUNG SOL ELECTRONIC TUBES 4 OF 4

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CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MARNETIC FOCUS 8 DEFLECT10N	8 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC ION TRAP CURRENT STANDARD COIL #!iii (APPROX.J	12 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
BF OR STANDARD FOCUS COIL /109. OR EO UVAI ENT. wITM THE COMBINED GRID /1 81 AS VOLTAGE AMD VIDEO – value 1	109 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
BF OR STANDARD FOCUS COIL /109. OR EO UVAI ENT. wITM THE COMBINED GRID /1 81 AS VOLTAGE AMD VIDEO – value 2	1 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
BF OR STANDARD FOCUS COIL /109. OR EO UVAI ENT. wITM THE COMBINED GRID /1 81 AS VOLTAGE AMD VIDEO – value 3	81 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
SIGNAL VOLTAGE ADJU STEO TO PRODUCE A NI GMI IGMT BRIGNTNEIS OF 20 FOOT IAYBER TI ON A 10 1/4" BY – value 1	10 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
SIGNAL VOLTAGE ADJU STEO TO PRODUCE A NI GMI IGMT BRIGNTNEIS OF 20 FOOT IAYBER TI ON A 10 1/4" BY – value 2	1 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
SIGNAL VOLTAGE ADJU STEO TO PRODUCE A NI GMI IGMT BRIGNTNEIS OF 20 FOOT IAYBER TI ON A 10 1/4" BY – value 3	4 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
1N 1/2• PICTURE SIZE. DISTANCE FROM REFERENCE LINE TO CENTER OF AIR GAP ON FOCUS COIL SN All BE – value 1	1	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
1N 1/2• PICTURE SIZE. DISTANCE FROM REFERENCE LINE TO CENTER OF AIR GAP ON FOCUS COIL SN All BE – value 2	1	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
1N 1/2• PICTURE SIZE. DISTANCE FROM REFERENCE LINE TO CENTER OF AIR GAP ON FOCUS COIL SN All BE – value 3	2	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAXIMUM DC ANODE VOLTAGE	15000 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAXIMUM DC GRID i2 VOLTAGE	41 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAXIMUM GRID	1 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.

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