



ELECTRONIC TUBE REFERENCE

16GP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Direct-view P4 television picture tube using magnetic focusing and deflection, with white medium-persistence fluorescence, approximately 70-degree deflection, and typical 12 kV anode operation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	120	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

SECTION 1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	14000 V
MAXIMUM SCREEN VOLTAGE	410 V
<i>CRT-specific anode/focus/deflection ratings retained as parameters rather than mapped to ordinary plate/screen fields.</i>	

16GP4 — Direct-View Metal Cathode-Ray Picture Tube

The **16GP4**, along with its variants **16GP4A**, **16GP4B**, and **16GP4C**, is a 16-inch round, metal-cone direct-view cathode-ray tube designed for television receiver applications. The tube features magnetic focus and deflection, a 70-degree deflection angle, and an electron gun designed for use with an external single-field ion-trap magnet. The series provides a picture size of approximately 14-3/4 by 10-3/4 inches with rounded sides, or a 10 by 13-1/4 inch raster size.

Faceplate Variants and Optical Characteristics

The four designations in this family are electrically identical but differ in their faceplate treatments to suit different viewing preferences and ambient light conditions:

- **16GP4:** Features a grey filter faceplate to increase picture contrast and detail under high ambient light conditions.
- **16GP4A:** Features a clear glass faceplate.
- **16GP4B:** Features a grey filter faceplate with a frosted finish to prevent specular reflection of ambient light.
- **16GP4C:** Features a clear glass faceplate with a frosted finish.

The optical system utilizes a sulfide-type No. 4 (P4) phosphor screen that produces a white fluorescence and white phosphorescence. The persistence of the phosphor is characterized as short to medium. For the grey-faceplate variants (16GP4 and 16GP4B), the light transmission at the center of the faceplate is approximately 65% to 66%. The frosted faceplate of the 16GP4B limits the specular reflection of ambient light to a maximum of 2.5%.

Mechanical Construction and Installation

The tube is constructed with a lightweight metal cone envelope and a spherical glass faceplate. Because the metal cone operates at high voltage, it must be adequately insulated in the receiver cabinet to withstand the maximum applied anode voltage.

The physical dimensions and mechanical limits of the tube include:

- **Overall Length:** 17-1/4 ± 3/8 inches (with a maximum overall length of 17-11/16 inches).
- **Greatest Bulb Diameter:** 15-7/8 ± 1/8 inches.
- **Minimum Useful Screen Diameter:** 14-3/8 inches.
- **Neck Length:** 6-7/8 inches.
- **Approximate Net Weight:** 10 pounds.
- **Mounting Position:** Any.

An external single-field ion-trap magnet must be positioned on the neck of the tube. The space around the neck must be kept clear for the proper placement of this magnet. The reference line of the cone is determined by the plane of the upper edge of a standard reference-line gage when resting on the cone.

Electrical Specifications and Basing

The tube uses a small shell duodecal 5-pin base (JETEC designation B5-57) with a 12D basing arrangement. The electrical connections viewed from the bottom of the base are as follows:

Pin Number	Connection
Pin 1	Heater
Pin 2	Grid No. 1

Pin Number	Connection
Pin 10	Grid No. 2
Pin 11	Cathode
Pin 12	Heater
Metal Shell Lip	Anode, Grid No. 3

The anode and Grid No. 3 are internally connected together and terminate at the metal shell lip.

Heater and Interelectrode Capacitances

The unipotential cathode is indirectly heated. The nominal heater ratings and direct interelectrode capacitances are:

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.6 Amperes (with a tolerance of $\pm 10\%$)
- **Cathode to All Other Electrodes:** 5 μpf (approximate)
- **Grid No. 1 to All Other Electrodes:** 6 μpf (approximate)

Maximum Ratings

The following maximum ratings are established under the design-center system. These ratings provide a safety margin, and the tube is designed to withstand variations in line voltage and components provided these design-center values are not exceeded by more than ten percent. All voltages are measured with respect to the cathode.

- **Maximum DC Anode & Grid No. 3 Voltage:** 14,000 Volts
- **Maximum Anode Power:** The product of the anode voltage and the average anode current must be limited to 6 Watts.
- **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, ≤ 15 seconds):* 410 Volts
 - *Heater negative with respect to cathode (after warm-up):* 150 Volts
 - *Heater positive with respect to cathode:* 150 Volts
- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms

Typical Operating Conditions

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

- **DC Anode & Grid No. 3 Voltage:** 12,000 Volts (Note: Brightness and focus quality decrease with decreasing anode voltage; operation should generally not be below 10,000 to 12,000 Volts).
- **DC Grid No. 2 Voltage:** 300 Volts
- **DC Grid No. 1 Voltage (for visual extinction of focused spot/raster):** -28 to -72 Volts (or -33 to -77 Volts depending on specific operating setups).
- **DC Focusing Coil Current:** Approximately 100 to 103 Milliamperes DC. This applies when using a standard focus coil positioned with the center of its air gap 3 to 3-1/8 inches from the reference line.
- **Ion-Trap Magnet Field Intensity:** 23 Gauss (or up to 35 Gauss for the [16GP4A](#) and [16GP4B](#) variants, or when adjusted to optimum position equivalent to 35 milliamperes through a standard ion-trap magnet).

Technical Summary

The **16GP4** family consists of 16-inch, round, metal-cone cathode-ray picture tubes utilizing magnetic focus and deflection with a 70-degree deflection angle. Operating with a 6.3 V, 0.6 A heater, these tubes are designed for television display service, offering a white-emitting P4 phosphor screen. The series provides distinct faceplate options—ranging from clear glass to grey-filtered and frosted surfaces—to optimize contrast and minimize reflections. With an anode rating of up to 14,000 Volts and a standard duodecal [12D](#) basing configuration, the 16GP4 series represents a standardized solution for direct-view television receivers of its era.



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	14000 V	—
Typical Anode Voltage	12000 V	—
Maximum Grid2 Voltage	410 V	—
Typical Grid2 Voltage	300 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DeflectionAngleApproximate	70 degree	—
FocusingMethod	Magnetic	—
DeflectingMethod	Magnetic	—
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

Section 1 · Cathode Ray

CONSTRUCTION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	Magnetic	—
Deflecting method	Magnetic	—
Phosphor	P4	White;MediumPersistence

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Deflection angle	70 deg	Approximate
Faceplate light transmission at center	65 %	Approximate

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	5 pF	Approximate
Grid #1 to all other electrodes capacitance	6 pF	Approximate

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—
Maximum DC anode voltage	14000 V	—
Maximum DC grid #2 voltage	410 V	—
Maximum grid #1 negative-bias magnitude	125 V	—
Maximum grid #1 positive DC bias	0 V	—
Maximum grid #1 positive peak	2 V	—
Typical DC anode voltage	12000 V	TelevisionPictureTube
Typical DC grid #2 voltage	300 V	TelevisionPictureTube
Typical grid #1 voltage minimum	-77 V	VisualExtinctionRange
Typical grid #1 voltage maximum	-33 V	VisualExtinctionRange

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing coil current	200 mA	Approximate
Ion trap magnet strength	25 gauss	Approximate
Maximum heater-cathode voltage during warm-up	410 V	HeaterNegative;Warmup<=15s

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Direct-view television picture tube	—


SOURCE DATA APPENDIX

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 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltageNominal	6.3 V	—
HeaterOrFilamentCurrentNominal	600 mA	—

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