



ELECTRONIC TUBE REFERENCE

16DP4

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 60-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	15000 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>	

16DP4 — Direct-View Television Picture Tube

The **16DP4** and **16DP4A** are direct-view cathode-ray picture tubes designed for television applications. These tubes feature a round glass construction, an indirectly heated unipotential cathode, magnetic focus and deflection systems, and require an external double-field ion trap magnet. They are designed to display a standard television raster size of 10 1/4 inches by 14 1/2 inches.

The two designations are identical in design and electrical characteristics with a single physical exception:

- **16DP4**: Features a clear glass faceplate.
- **16DP4A**: Features a grey filter faceplate to improve contrast under ambient light.

Mechanical Specifications and Physical Dimensions

The 16DP4 and 16DP4A are large-format glass cathode-ray tubes. Their physical dimensions and mechanical features are precisely defined to ensure proper mounting and alignment within television receivers:

- **Overall Length:** $20 \frac{3}{4} \pm \frac{1}{4}$ inches
- **Greatest Diameter of Bulb:** $15 \frac{7}{8} \pm \frac{1}{8}$ inches
- **Minimum Useful Screen Diameter:** $14 \frac{1}{2}$ inches
- **Neck Diameter:** $1 \frac{7}{16} \pm \frac{1}{16}$ inches
- **Bulb Contact:** Recessed small cavity cap (designated J1-21)
- **Base:** Small shell duodecal 5-pin base (designated B5-57)
- **Basing Configuration:** 12D
- **Bulb Contact Alignment:** The J1-21 anode contact aligns with the pin position #3 within a tolerance of ± 10 degrees.
- **Ion Trap Space:** A dedicated space of $3 \frac{5}{8} \pm \frac{1}{16}$ inches along the neck must be kept clear for the installation of the external ion trap magnet.

Electrical Characteristics and Basing

Electrical connections are made through the 5-pin duodecal base at the end of the neck, with the high-voltage anode connection made via the recessed cavity cap on the side of the bulb.

Pin Connections (Bottom View)

The 12D basing arrangement provides the following pinout:

Pin / Terminal	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 10	Grid No. 2
Pin 11	Cathode
Pin 12	Heater
Anode Cap	Anode (Grid No. 3 / Screen)

Interelectrode Capacitances

The direct interelectrode capacitances of the tube are approximately:

- **Cathode to all other electrodes:** $5.0 \mu\text{F}$
- **Grid No. 1 to all other electrodes:** $6.5 \mu\text{F}$

Ratings and Operating Conditions

The operating limits and typical operating points of the 16DP4 and [16DP4A](#) are specified under the Design Center system.

Design Center Maximum Ratings

Parameter	Maximum Rating
Heater Voltage	6.3 V
Heater Current	0.6 A
DC Anode Voltage	15,000 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
Grid No. 1 Positive-Peak Value	2 V
Peak Heater-Cathode Voltage (Heater negative with respect to cathode during warm-up, ≤ 15 s)	410 V
Peak Heater-Cathode Voltage (Heater negative with respect to cathode after warm-up)	125 V
Peak Heater-Cathode Voltage (Heater positive with respect to cathode)	125 V
Grid No. 1 Circuit Resistance	1.5 M Ω

Typical Operating Conditions

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

- **DC Anode Voltage:** 12,000 V (Operating anode voltage should not fall below 9,000 V, as brilliance and definition decrease with decreasing anode voltage.)
- **DC Grid No. 2 Voltage:** 250 V
- **DC Grid No. 1 Voltage:** -27 V to -63 V (This range represents the limits for visual extinction of the undeflected focused spot.)
- **DC Focusing Coil Current:** $115 \pm 15\%$ mA (This value is approximate and applies when using a standard focus coil No. 109 or equivalent. The distance from the reference line to the center of the air gap on the focus coil is specified as 3.25 inches. This current is determined with the combined Grid No. 1 bias voltage and video signal voltage adjusted to produce a highlight brightness of 20 foot-lamberts on the 10 1/4" by 14 1/2" picture area.)
- **DC Ion Trap Current:** 109 mA (Approximate, using standard coil No. 108.)

Optical and Screen Characteristics

The screen of the 16DP4 and [16DP4A](#) utilizes a specialized phosphor coating to produce a clear, viewable image:

- **Phosphor Number:** No. 4
- **Fluorescent Color:** White
- **Phosphorescent Color:** White
- **Persistence:** Medium
- **Deflection Angle:** Approximately 60 degrees
- **Faceplate Light Transmission:** The [16DP4A](#) grey filter faceplate has an approximate light transmission of 70 percent at the center, which helps control reflections and enhances contrast in brightly lit environments.

Technical Summary

The **16DP4** and [16DP4A](#) are 16-inch class, round glass, direct-view television picture tubes featuring magnetic focus and deflection with a 60-degree deflection angle. Operating with a nominal 6.3 V, 0.6 A heater, they are designed for high-voltage operation up to a maximum of 15,000 V DC on the anode. They utilize a standard No. 4 white phosphor with medium persistence. The 16DP4 is equipped with a clear glass faceplate, while the [16DP4A](#) incorporates a 70% transmission grey filter faceplate to optimize picture contrast. Both variants employ a small shell duodecal 5-pin base and require an external double-field ion trap magnet for proper operation.



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	300 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DeflectionAngleApproximate	60 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	60 deg	Approximate

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	5 pF	Approximate
Grid #1 to all other electrodes capacitance	6.5 pF	Approximate

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—
Maximum DC anode voltage	15000 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	250 V	TelevisionPictureTube
Typical grid #1 voltage minimum	-63 V	VisualExtinctionRange
Typical grid #1 voltage maximum	-27 V	VisualExtinctionRange
Focusing coil current	115 mA	Approximate
Ion trap current	109 mA	Approximate

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum heater-cathode voltage during warm-up	410 V	HeaterNegative;Warmup<=15s

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