



ELECTRONIC TUBE REFERENCE

16XP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

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 16XP4.

GENERAL CHARACTERISTICS

BASE DESIGNATION	BS-57	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
<i>CRT-specific anode, focus, deflection and optical data retained as parameters rather than forced into ordinary plate/screen fields.</i>	

16XP4 — Rectangular Cathode Ray Picture Tube

The **16XP4** is a direct-view cathode ray picture tube designed for use in television applications. It features a rectangular glass construction, a unipotential cathode, magnetic focus and deflection, and requires an external double field ion trap. The tube is equipped with a grey filter faceplate to improve contrast under ambient light conditions.

Mechanical Specifications and Physical Dimensions

The 16XP4 is constructed with a rectangular glass bulb and has the following physical dimensions:

- **Overall Length:** 18 3/4 ± 3/8 inches
- **Greatest Bulb Dimensions:**
 - **Diagonal:** 16 1/8 inches
 - **Width:** 14 3/4 inches
 - **Height:** 11 1/2 inches
- **Minimum Useful Screen Dimensions:**
 - **Diagonal:** 15 inches
 - **Width:** 13 19/32 inches
 - **Height:** 10 3/16 inches
- **Raster Size:** 10 1/8 × 13 1/2 inches

Bulb Connections and Alignment

The electrical connection to the high-voltage anode is made via a recessed small cavity cap (designation J1-21) located on the side of the bulb. The base of the tube is a small shell duodecal 5-pin base (designation B5-57), which utilizes the [12D](#) basing configuration.

Proper alignment of the bulb contact is specified such that the J1-21 contact aligns between pin positions #6 and #7 within a tolerance of ± 10 degrees. Additionally, a designated space on the neck of the tube must be kept clear for the installation of the external ion trap magnet.

Electrical and Optical Characteristics

The 16XP4 utilizes magnetic fields for both focusing the electron beam and deflecting it across the screen.

Deflection Angles

The nominal deflection angles of the electron beam are:

- **Horizontal:** 65 degrees
- **Vertical:** 50 degrees
- **Diagonal:** 70 degrees

Optical Properties

The screen is coated with Phosphor No. 4, which exhibits the following characteristics:

- **Fluorescent Color:** White
- **Phosphorescent Color:** White
- **Persistence:** Medium
- **Faceplate Light Transmission:** Approximately 70 percent at the center of the faceplate.

Pin Connections and Basing

The 16XP4 uses a 5-pin duodecal base (B5-57) with a 12D basing arrangement. Looking at the bottom view of the base, the pin assignments are as follows:

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 (J1-21 Recessed Cavity Cap)

The heater is designed to operate on either AC or DC, with a nominal heater voltage of 6.3 Volts and a nominal heater current of 0.6 Ampere.

Operating Ratings and Typical Conditions

The operating limits and typical operating parameters of the 16XP4 are defined under the Design Center system.

Design Center Maximum Ratings

These ratings represent the maximum safe limits to which the tube may be subjected:

- **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 $\leq$ 15 seconds):** 410 Volts
 - **Heater Negative with Respect to Cathode (after equipment warm-up):** 125 Volts
 - **Heater Positive with Respect to Cathode:** 125 Volts
- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms

Typical Operating Conditions

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

- **DC Anode Voltage:** 12,000 Volts

- **DC Grid No. 2 Voltage:** 250 Volts
- **DC Grid No. 1 Voltage:** -27 to -63 Volts (for visual extinction of the undeflected focused spot)
- **DC Focusing Coil Current:** Approximately 100 mA
- **DC Ion Trap Current:** Approximately 120 mA (using standard coil #108)

The typical focusing coil current of 100 mA is specified for 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 $10 \frac{1}{8} \times 13 \frac{1}{2}$ inch picture size. The physical placement of the focus coil requires that the distance from the reference line to the center of the air gap on the focus coil be exactly 3 inches.



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

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum DC grid 2 voltage	410 V	—
Maximum grid 1 negative-bias voltage	125 V	NegativeBias
Maximum grid 1 positive-bias voltage	0 V	PositiveBias
Maximum grid 1 positive-peak voltage	2 V	PositivePeak
Peak heater-cathode voltage	410 V	HeaterNegativeWarmup
Peak heater-cathode voltage	125 V	HeaterNegativeAfterWarmup
Peak heater-cathode voltage	125 V	HeaterPositive
DC anode voltage	12000 V	TypicalOperation
DC grid 2 voltage	250 V	TypicalOperation
DC grid 1 voltage	-27--63 V	TypicalOperation
Focusing coil current	100 mA	Approximate
Ion trap current	120 mA	Approximate
Faceplate transmission at center	70 %	Approximate

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Horizontal deflection angle	65 degrees	Approximate
Vertical deflection angle	50 degrees	Approximate
Diagonal deflection angle	70 degrees	Approximate

TUBE TINKER

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