

ELECTRONIC TUBE REFERENCE

10NP11

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Magnetically focused and deflected P11 cathode-ray display tube with a gray filter faceplate, aluminized blue short-persistence screen, approximately 52-degree deflection, and an anode rating up to 25 kV.

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
No fixed ratings recorded.
Video-recording CRT electron-gun/display section.

10NP11 — Video Recording Cathode-Ray Tube

The **10NP11** is a specialized, 10-inch round glass cathode-ray tube designed primarily for video recording applications. It features magnetic deflection, magnetic focusing, an aluminized screen, and a gray filter glass faceplate. The tube utilizes a P11 phosphor, which is characterized by blue fluorescence and short persistence, making it highly suitable for photographic and video recording systems where rapid response and high actinic efficiency are required.

Mechanical Specifications and Physical Dimensions

The 10NP11 is constructed with a round glass envelope and has a minimum useful screen diameter of 9 1/8 inches. The physical dimensions and mechanical features of the tube are precisely defined to ensure proper mounting and alignment:

- **Overall Length:** 17 5/8 ± 3/8 inches
- **Bulb Diameter:** 10 1/2 ± 3/16 inches
- **Neck Length:** 8 1/8 ± 3/16 inches
- **Neck Diameter:** 1 7/16 ± 1/16 inches
- **Faceplate Radius of Curvature:** 42 inches
- **Deflecting Angle (approximate):** 52 degrees

The tube uses a **Small Shell Duodecal 5-Pin** base (designation B5-57) with a **12G** basing arrangement. The electrical connections are made through this base, while the high-voltage anode connection is made via a recessed small cavity cap (designation J1-21) located on the bulb cone. The bulb contact is aligned with the vacant pin position No. 3 within a tolerance of ±30 degrees.

The reference line of the bulb cone, which is critical for positioning deflection and focusing components, is determined by the position where a JETEC reference line gauge No. 112 rests on the cone.

Electrical and Interelectrode Characteristics

The 10NP11 features an indirectly heated cathode. The heater is designed for standard parallel or series operation in video equipment.

Heater Ratings

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.6 Ampere

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the tube are approximately as follows:

- **Cathode to All Other Electrodes:** 5 µf
- **Grid to All Other Electrodes:** 6 µf
- **External Conductive Coating to Anode:** 1500 µf maximum, 500 µf minimum

Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 Megohms maximum

Operating Ratings and Recommended Conditions

The ratings for the 10NP11 are established under the Design Center system. Operating the tube within these limits is necessary to ensure reliable performance and longevity.

Maximum Ratings (Design Center Values)

- **Anode Voltage:** 25,000 Volts dc
- **Grid Voltage:**

- *Negative Bias Value:* 350 Volts dc
- *Positive Bias Value:* 0 Volts dc
- *Positive Peak Value:* 2 Volts
- **Peak Heater-Cathode Voltage:**
 - *Heater Negative with Respect to Cathode:*
 - During Warm-Up Period (not to exceed 15 seconds): 410 Volts
 - After Equipment Warm-Up Period: 150 Volts
 - *Heater Positive with Respect to Cathode:* 150 Volts

Recommended Operating Conditions

- **Anode Voltage:** 18,000 Volts dc
- **Grid Voltage (for visual extinction of undeflected focused spot):** -65 to -125 Volts dc
- **Focusing Coil Current (approximate):** 110 mA dc (measured using a JETEC focusing coil 109 or equivalent, positioned three and one-quarter inches from the reference line)

X-Ray Radiation Warning

Because the 10NP11 operates at high voltages, X-ray radiation shielding may be necessary to protect against the danger of personal injury from prolonged exposure at close range. This precaution is particularly important if the tube is operated at voltages higher than the manufacturer's maximum rated anode voltage or 16,000 volts, whichever is less.

Technical Summary

The **10NP11** is a specialized 10-inch round glass video recording cathode-ray tube featuring magnetic focus, magnetic deflection (52-degree deflection angle), and an aluminized screen with a P11 blue-emitting, short-persistence phosphor. It operates with a 6.3 V, 0.6 A heater and is housed in a bulb with a Small Shell Duodecal 5-Pin base and a J1-21 anode cap. Under typical operating conditions, it utilizes an anode voltage of 18,000 V dc, a grid bias of -65 to -125 V dc for spot extinction, and a focusing coil current of approximately 110 mA dc. Designers must observe the maximum anode voltage rating of 25,000 V dc, heater-cathode voltage limits, and implement appropriate X-ray shielding when operating near or above 16,000 V.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1965 Sylvania Electronic Tubes Vol3

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

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	600 mA	—
Focusing Method	Magnetic text	—
Deflection Method	Magnetic text	—
Deflection Angle	52 deg	Approximate
Phosphor	P11 text	—
Fluorescence	Blue text	—
Persistence	Short text	—
Faceplate	Gray Filter Glass text	—
Screen Aluminized	Yes text	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	25000 V	—
Maximum Grid Negative Bias	550 V	—
Maximum Grid Positive Peak	2 V	—
Maximum Heater-Cathode Voltage During Warmup	410 V	—
Maximum Heater-Cathode Voltage After Warmup	150 V	EitherPolarity
Maximum Grid1 Circuit Resistance	1.5 Mohm	—

An independent reference for electronic tubes, vacuum tubes,
and their source documents.

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