



## ELECTRONIC TUBE REFERENCE

# 19DNP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

**1 SECTION**  
CONSTRUCTION  
**CATHODERAY**

Nineteen-inch direct-view monochrome television CRT with electrostatic focus, magnetic deflection, and an aluminized P4 white screen. Wide-angle deflection and high-voltage operation provide a bright large-screen receiver image, with published X-ray precautions.

## GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | 8HR               | 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

|                                                                                                                              |         |
|------------------------------------------------------------------------------------------------------------------------------|---------|
| <b>SECTION 1</b> Cathode Ray                                                                                                 |         |
| MAXIMUM PLATE VOLTAGE                                                                                                        | 18000 V |
| <i>Cathode-ray picture-tube section; anode rating and published direct capacitances captured from supplied family sheet.</i> |         |

## 19DNP4 — Television Picture Tube

The **19DNP4** is a 19-inch direct-viewed rectangular glass television picture tube designed for use in television receivers. It features a low anode voltage design, electrostatic focusing, and a 114-degree magnetic deflection system. The tube incorporates a bonded shield, gray filter glass, an aluminized screen, and an external conductive coating. It operates without an ion trap and has a 1-1/8 inch neck diameter.

## Physical Construction and Envelope

The 19DNP4 is constructed using a **J149C** glass bulb and features a **FP149B1** safety plate that is 1/8 inch thick with a light transmittance of 70%. The complete faceplate assembly has an overall light transmittance of approximately 60%. The tube weighs approximately 15.5 lbs.

Electrical connection to the anode is made via a recessed small cavity cap (**J1-21**), while the base is a **B7-208** type utilizing the **8HR** basing arrangement. The tube's external conductive coating forms a capacitor with the internal anode, providing a capacitance of 1000 pF minimum to 1500 pF maximum.

The deflection system is designed for magnetic deflection with the following approximate angles:

- **Diagonal:** 114°
- **Horizontal:** 101°
- **Vertical:** 86°

## Heater and Pinout Configuration

The 19DNP4 is equipped with an indirectly heated cathode. The heater has a controlled warm-up time of 11 seconds.

| Heater Parameter       | Value       |
|------------------------|-------------|
| Nominal Heater Voltage | 6.3 V       |
| Nominal Heater Current | 0.60 ± 5% A |
| Heater Warm-up Time    | 11 seconds  |

The **8HR** base pinout configuration, viewed from the bottom of the tube, is as follows:

- **Pin 1:** Heater (H)
- **Pin 2:** Grid No. 1 (G1)
- **Pin 3:** Grid No. 2 (G2)
- **Pin 4:** Grid No. 4 (G4, Focusing Electrode)
- **Pin 6:** Grid No. 1 (G1)
- **Pin 7:** Cathode (K)
- **Pin 8:** Heater (H)
- **Recessed Cavity Cap:** Anode (A)

Note that Grid No. 1 is connected to both Pin 2 and Pin 6.

## Interelectrode Capacitances

The approximate interelectrode capacitances of the tube are:

- **Cathode to all other electrodes:** 5 pF
- **Grid No. 1 to all other electrodes:** 6 pF

- **External conductive coating to Anode:** 1000 pF (minimum) / 1500 pF (maximum)

## Operating Services and Design-Maximum Ratings

The 19DNP4 can be operated in either Grid Drive Service or Cathode Drive Service. The ratings are defined under the Design-Maximum System.

### Grid Drive Service

In Grid Drive Service, the control signal is applied to Grid No. 1. The absolute and design-maximum ratings are:

- **Anode Voltage:** 10,000 V to 18,000 V dc
- **Grid No. 4 Voltage (Focusing Electrode):** -550 V to +1100 V dc
- **Grid No. 2 Voltage:** 200 V to 550 V dc
- **Grid No. 1 Voltage:**
  - Negative Bias Value: 155 V dc
  - Negative Peak Value: 220 V
  - Positive Bias Value: 0 V dc
  - Positive Peak Value: 2 V

### Cathode Drive Service

In Cathode Drive Service, the control signal is applied to the cathode. The absolute and design-maximum ratings are:

- **Anode Voltage:** 10,000 V to 18,000 V dc
- **Grid No. 4 Voltage (Focusing Electrode):** -400 V to +1250 V dc
- **Grid No. 2 Voltage:** 350 V to 700 V dc
- **Cathode Voltage:**
  - Positive Bias Value: 155 V dc
  - Positive Peak Value: 220 V
  - Negative Bias Value: 0 V dc
  - Negative Peak Value: 2 V

### Heater-Cathode Voltage Ratings (Both Services)

The peak heater-cathode voltage limits are identical for both Grid Drive and Cathode Drive configurations:

- **Heater negative with respect to cathode (during warm-up  $\leq$  15 seconds):** 450 V maximum
- **Heater negative with respect to cathode (after warm-up):** 200 V maximum
- **Heater positive with respect to cathode:** 200 V maximum

## Maximum Circuit Values

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

## Typical Operating Conditions

The tube's typical operating parameters are specified for both drive methods at an anode voltage of 16,000 V dc.

### Grid Drive Typical Operation

- **Anode Voltage:** 16,000 V dc
- **Grid No. 4 Voltage for Focus:** 0 to 400 V dc
- **Grid No. 2 Voltage:** 400 V dc
- **Grid No. 1 Voltage Required for Cutoff:** -40 to -76 V dc

### Cathode Drive Typical Operation

- **Anode Voltage:** 16,000 V dc
- **Grid No. 4 Voltage for Focus:** 0 to 400 V dc
- **Grid No. 2 Voltage:** 400 V dc
- **Cathode Voltage Required for Cutoff:** 36 to 68 V dc

## Technical Summary

The **19DNP4** is a 19-inch rectangular glass television picture tube featuring a 114° diagonal magnetic deflection angle, electrostatic focusing, and a low anode voltage design. It utilizes a 6.3 V, 0.60 A heater with an 11-second warm-up time and is housed in a J149C bulb with an 8HR base configuration. Designed for both Grid Drive and Cathode Drive television receiver applications, it operates with typical anode voltages around 16,000 V dc, providing a robust and integrated display solution with its bonded safety shield and external conductive coating.



## SOURCE OPERATING CONDITIONS

# 1950 Sylvania

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

## 1950 SYLVANIA

## Section 1 · Cathode Ray

| CHARACTERISTICS   |                 |                  |
|-------------------|-----------------|------------------|
| PARAMETER         | PUBLISHED VALUE | CONDITION / NOTE |
| Phosphor          | P4              | —                |
| Focusing method   | Electrostatic   | —                |
| Deflection method | Magnetic        | —                |

| OTHER          |                 |                  |
|----------------|-----------------|------------------|
| PARAMETER      | PUBLISHED VALUE | CONDITION / NOTE |
| Heater voltage | 6.3 V           | —                |
| Heater current | 600 mA          | —                |



## 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

| CHARACTERISTIC   |                     |                  |
|------------------|---------------------|------------------|
| PARAMETER        | PUBLISHED VALUE     | CONDITION / NOTE |
| Heater Voltage   | 6.3 V               | —                |
| Heater Current   | 600 mA              | —                |
| FocusingMethod   | Electrostatic       | —                |
| DeflectionMethod | Magnetic            | —                |
| Phosphor         | Aluminized P4 white | —                |

| PARAMETER                                          | PUBLISHED VALUE           | CONDITION / NOTE |
|----------------------------------------------------|---------------------------|------------------|
| DeflectionAngles                                   | <b>110-class magnetic</b> | —                |
| Cathode To All Capacitance                         | <b>5 pF</b>               | —                |
| Grid1 To All Capacitance                           | <b>6 pF</b>               | —                |
| ExternalConductiveCoatingToAnodeCapacitanceMaximum | <b>1500 pF</b>            | —                |
| ExternalConductiveCoatingToAnodeCapacitanceMinimum | <b>1000 pF</b>            | —                |
| RimbandToExternalCoatingResistanceMinimum          | <b>50 Mohm</b>            | —                |

| OTHER                                |                        |                            |
|--------------------------------------|------------------------|----------------------------|
| PARAMETER                            | PUBLISHED VALUE        | CONDITION / NOTE           |
| AnodeVoltageMaximum                  | <b>18000 V</b>         | —                          |
| AnodeVoltageMinimum                  | <b>10000 V</b>         | —                          |
| FocusingElectrodeVoltageRangeMaximum | <b>-400 to +1250 V</b> | —                          |
| Grid2VoltageMaximum                  | <b>550 V</b>           | —                          |
| Grid2VoltageMinimum                  | <b>200 V</b>           | —                          |
| Grid1NegativeBiasMagnitudeMaximum    | <b>140 V</b>           | —                          |
| Grid1PositivePeakVoltageMaximum      | <b>2 V</b>             | —                          |
| HeaterCathodeVoltageMaximum          | <b>450 V</b>           | Warmup<=15s;HeaterNegative |
| HeaterCathodeVoltageMaximum          | <b>200 V</b>           | AfterWarmup                |
| HeaterCathodeVoltageMaximum          | <b>200 V</b>           | HeaterPositive             |
| Anode Voltage                        | <b>16000 V</b>         | —                          |
| FocusingElectrodeVoltage             | <b>0 to +400 V</b>     | —                          |
| Grid1VoltageForCutoff                | <b>-40 to -76 V</b>    | —                          |
| Grid1CircuitResistanceMaximum        | <b>1.5 Mohm</b>        | —                          |

## TUBE TINKER

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and their source documents.

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