

ELECTRONIC TUBE REFERENCE

16CMP4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Large-screen cathode-ray display tube with a projected screen area around 125 square inches, typical 16 kV anode operation, and adjustable electrostatic focusing.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
NOMINAL HEATER	6.9 V / 20 A	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM SCREEN VOLTAGE	550 V
CRT-specific ratings, operating conditions, capacitances, focus/deflection, cutoff, optical, and screen data are retained in section parameters.	

16CMP4A Picture Tube

The **16CMP4A** is a PAN-O-PLY type cathode-ray tube designed for television display applications. It features a 114-degree magnetic deflection system, a short neck, and an electron gun design that does not require an external ion-trap magnet. The tube incorporates integral implosion protection hardware and an aluminized P4-sulfide phosphor screen.

Electrical Specifications and Heater Ratings

The 16CMP4A utilizes an indirectly heated cathode. The heater is designed to operate within a specified voltage range, with performance characteristics optimized around a nominal operating point.

Parameter	Value
Nominal Heater Voltage	6.3 V
Heater Voltage Range	5.7 V to 6.9 V
Heater Current (at 6.3 V)	450 ± 20 mA
Average Heater Warm-Up Time	11 s

Direct Interelectrode Capacitances

- **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

Heater-Cathode Voltage Limits

To prevent insulation breakdown, the voltage difference between the heater and the cathode must be maintained within strict limits:

- **Heater negative with respect to cathode:**
 - During equipment warm-up period (less than or equal to 15 seconds): 450 V maximum
 - After equipment warm-up period: 300 V maximum
- **Heater positive with respect to cathode:**
 - Combined AC and DC voltage: 200 V maximum
 - DC component: 100 V maximum

Mechanical Design and Physical Dimensions

The 16CMP4A is constructed with a rectangular glass envelope, a filterglass faceplate, and an external conductive coating. The external coating is a regular-band type, with a designated contact area for grounding located near the reference line.

Physical Dimensions and Weight

- **Overall Length:** 10.569 ± 0.242 inches
- **Neck Length:** 4.375 ± 0.125 inches
- **Neck Diameter:** 1.125 +0.043 / -0.025 inches
- **Weight (Approximate):** 9.5 lbs (including implosion protection hardware)
- **Deflection Angles:** 114° diagonal magnetic deflection, 102° horizontal deflection

Screen and Faceplate Characteristics

- **Phosphor:** Aluminized P4-Sulfide type
- **Faceplate Material:** Filterglass

- **Light Transmission at Center:** Approximately 54%
- **Projected Area of Screen:** 125 sq. in.
- **Minimum Screen Dimensions:**
 - Diagonal: 14.875 inches
 - Height: 10.250 inches
 - Width: 12.938 inches
- **Minimum Rim-Band Opening Dimensions:**
 - Diagonal: 15.167 inches
 - Height: 10.494 inches
 - Width: 13.141 inches

The tube is equipped with a Recessed Small Cavity anode cap (JEDEC No. J1-21) and a Small-Button Neoeightar 7-Pin base (Arrangement 1, JEDEC No. B7-208). The reference line of the neck is determined using a JEDEC No. G-126 gauge.

Terminal Connections and Pinout

The 16CMP4A uses the **8HR** base arrangement. The terminal connections, viewed from the bottom of the tube, are configured as follows:

Pin Number	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 3	Grid No. 2
Pin 4	Grid No. 4
Pin 6	Grid No. 1
Pin 7	Cathode
Pin 8	Heater
Cap	Anode (Grid No. 3, Grid No. 5, Screen, Collector)
C	External Conductive Coating (Grounding)

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

Maximum Ratings and Operating Conditions

The ratings of the 16CMP4A are established under the Design-Maximum system. All voltages are positive with respect to the cathode unless otherwise specified.

Design-Maximum Ratings

- **Anode Voltage:** 10,000 V minimum to 18,000 V maximum
- **Grid-No. 4 Voltage:**
 - Positive value: 1100 V maximum
 - Negative value: 550 V maximum
- **Grid-No. 2 Voltage:** 200 V minimum to 550 V maximum
- **Grid-No. 1 Voltage:**
 - Negative peak value: 220 V maximum
 - Negative bias value: 155 V maximum
 - Positive bias value: 0 V maximum
 - Positive peak value: 2 V maximum

Typical Operating Conditions (Cathode-Drive Service)

In cathode-drive service, voltages are specified positive with respect to Grid No. 1:

- **Anode Voltage:** 16,000 V
- **Grid-No. 4 Voltage:** -100 V to 300 V
- **Grid-No. 2 Voltage:** 300 V
- **Cathode Voltage (for visual extinction of focused raster):** 28 V to 60 V
- **Centering Magnet Field Strength:** 0 to 8 Gauss (adjustable centering magnet required)

Maximum Circuit Values

- **Grid-No. 1 Circuit Resistance:** 1.5 M Ω maximum

SOURCE OPERATING CONDITIONS
[SOURCE PDF](#)

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

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Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to al l other electrodes	6 pF	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
External conductive coating to anode. 1000 min – 1500 max pF – published value 1	1000 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
External conductive coating to anode. 1000 min – 1500 max pF – published value 2	1500 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
i.~, – published value 1	6.3 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
i.~, – published value 2	450 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
i.~, – published value 3	20 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Projected Area of Screen	125	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
P'n 4 -Grid No.A	4	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Anode Voltage – published value 1	10000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Anode Voltage – published value 2	18000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.2 Voltage – published value 1	200 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.2 Voltage – published value 2	550 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Voltage – published value 1	5.7 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Voltage – published value 2	6.9 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Combined AC & DC voltage	200 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Voltages are positive with respect to grid No. 1	1 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Anode Voltage	16000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.4 Voltage – published value 1	-100 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.4 Voltage – published value 2	300 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.2 Voltage	300 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Cathode Voltage – published value 1	28 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Cathode Voltage – published value 2	60 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No. 1 Circuit Resistance	1.5 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.