



ELECTRONIC TUBE REFERENCE

10MW4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Cathode-ray display tube using magnetic focusing and magnetic deflection, documented with a 4 V, 1 A heater in Cintel technical data.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	4 V / 1 A	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Cathode Ray

No fixed ratings recorded.

CRT operating ratings and direct interelectrode capacitances are published in the approved datasheet.

10MW4A — Television Monitor Cathode Ray Tube

A 10-inch nominal, magnetically focused and deflected cathode ray tube designed for television monitor applications, featuring an aluminium-backed white phosphor screen and an international octal base.

Overview

The **10MW4A** is a specialized cathode ray tube (CRT) designed primarily for television monitor service. It features a nominal 10-inch screen diameter and utilizes both magnetic focusing and magnetic deflection. The tube is constructed with an aluminium-backed screen that produces a white fluorescence with a short persistence, characterized by decay times of 5m sec. and 25m sec. to reach 1% of the initial brightness.

The 10MW4A is designed to operate with high anode voltages up to 11,000 V, providing a bright, high-resolution display suitable for critical monitoring tasks. Its physical design allows for mounting in any position, offering flexibility in equipment layout.

Physical Construction and Dimensions

The 10MW4A features a glass bulb with a nominal face diameter of 10 inches. The physical dimensions and tolerances of the envelope are tightly controlled to ensure precise alignment in monitoring equipment:

- **Overall Length:** 483 ± 10 mm
- **Greatest Bulb Diameter:** 257 mm
- **Face Diameter:** 254 ± 3 mm
- **Minimum Useful Screen Diameter:** 230 mm
- **Neck Diameter:** 34 mm minimum to 35.5 mm maximum
- **Face Curvature Radius:** 545 mm (outer surface)
- **Corner Radius:** 28 mm
- **Inner Face Radius:** 220 mm

The tube's reference line, which is critical for positioning the deflection and focusing components, is determined by the position where a cylindrical gauge with an internal diameter (I.D.) of 36 mm and a length of 50 mm rests on the bulb cone.

The final anode connection is made via a cavity cap conforming to BSS448/CT8 standards. The physical alignment of this cap is indexed to the base: the plane passing through the tube axis and the base spigot key may vary from the plane through the tube axis and the anode cap by an angular tolerance of no more than 10° (measured about the tube axis). The anode cap is located on the same side of the bulb as the spigot key.

Heater and Base Connections

The 10MW4A is equipped with an indirectly heated cathode. The heater is designed to operate on either alternating current (AC) or direct current (DC).

Heater Parameter	Value
Nominal Heater Voltage	4.0 V
Nominal Heater Current	1.0 A
Heating Supply Type	AC or DC

The tube utilizes an **International Octal** base. To prevent incorrect insertion and ensure proper insulation, several pin positions are omitted from the base structure. The pin connections, viewed from the underside of the base, are assigned as follows:

Pin Number	Connection
Pin 1	No connection
Pin 2	Heater
Pin 3	Pin omitted
Pin 4	Pin omitted
Pin 5	Modulator (Grid)
Pin 6	Pin omitted
Pin 7	Heater
Pin 8	Cathode
Metal Cap	Final Anode

Electrostatic and Magnetic Characteristics

The internal electrodes of the 10MW4A exhibit low direct inter-electrode capacitances, which helps maintain signal integrity in the drive circuitry:

- **Modulator to all other electrodes:** 9 μpF
- **Cathode to all other electrodes:** 9 μpF

Focusing and Deflection

Both focusing and deflection are accomplished magnetically. The typical focusing configuration requires a focusing coil capable of producing a specific magnetic field strength:

- **Focusing-Coil Current:** 550 Ampere-Turns (A.T.)
- **Focusing Coil Position:** The focusing coil must be positioned such that the center line of its air gap is approximately 80 mm from the established reference line of the bulb.

Under undeflected and unfocused conditions, the electron beam is highly centered. The center of the undeflected, unfocused spot will fall within a circle of 10 mm radius concentric with the geometric center of the tube face.

Operating Ratings and Typical Conditions

The 10MW4A operates under high-voltage conditions. To ensure reliable operation and prevent electrical breakdown, the operating parameters must be maintained within the specified maximum ratings.

Maximum Ratings (Absolute Values)

- **Final Anode Voltage:** 11,000 V maximum

- **Modulator Voltage (Negative Bias Value):** 130 V maximum
- **Modulator Voltage (Positive Bias Value):** 0 V maximum
- **Peak Heater-to-Cathode Voltage (Heater Negative with respect to Cathode):** 150 V maximum
- **Peak Heater-to-Cathode Voltage (Heater Positive with respect to Cathode):** 150 V maximum

Typical Operating Conditions

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

- **Anode Voltage:** 10,000 V
- **Modulator Voltage for Cut-off:** -70 V to -120 V
- **Focusing-Coil Current:** 550 A.T.

The modulator cut-off voltage range of -70 V to -120 V indicates the negative bias required on the modulator (grid) relative to the cathode to completely extinguish the beam spot when the anode is at its typical operating potential of 10,000 V.

Technical Summary

The **10MW4A** is a 10-inch nominal television monitor cathode ray tube employing magnetic focus and magnetic deflection. It features an aluminium-backed screen with white fluorescence and short persistence (5m sec. / 25m sec. for 1% initial brightness). Operating with a 4.0 V, 1.0 A heater, the tube is housed in a glass envelope with an International Octal base and a BSS448/CT8 cavity anode cap. It is rated for a maximum final anode voltage of 11,000 V, with a typical operating anode voltage of 10,000 V and a modulator cut-off range of -70 V to -120 V . The tube's physical and electrical characteristics are optimized for high-performance television monitoring applications, allowing mounting in any physical orientation.



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

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	4 V	Nominal published value
Heater Current	1 A	Nominal published value

CONSTRUCTION

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing Method	Magnetic	Published focusing method
Deflecting Method	Magnetic	Published deflection method

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