

ELECTRONIC TUBE REFERENCE

1B71

Specialized - Radiation Counter electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

GEIGERMULLERCOUNTER

Gas-filled Geiger-Müller radiation counter for pulse-counting detection. The available source establishes its counter function but does not provide enough supported detail to assign a narrower radiation-sensitivity description.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	— / —	PARALLEL HEATER	— / —
HEATING	Indirect; cold cathode	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1	GeigerMullerCounter
No fixed ratings recorded.	
Counter-tube source does not publish ordinary active-electrode promoted fields; counter performance is retained in parameters.	

1B71 — Gamma Counter Tube

The **1B71** is a radiation detection device designed specifically as a gamma counter tube. Introduced under RMA Release No. 657 on April 30, 1948, by the Amperex Electronic Corporation, this tube is engineered for detecting ionizing radiation, featuring high cosmic ray efficiency and a robust copper cathode construction.

Physical Construction and Dimensions

The 1B71 features a distinct physical layout optimized for radiation detection. The tube has an overall length of 7-13/16 inches. The central portion of the tube contains an exposed copper cathode section with

an outer diameter of 1.062 ± 0.007 inches and an exposed length of 3-3/4 inches. Internally, the effective cathode dimensions are specified as 3 inches in length, with a 1-inch outer diameter and a 1/16-inch wall thickness.

Electrical connections and mechanical mountings are located at the opposite ends of the tube:

- **Anode Terminal:** Positioned at one end of the tube, this terminal has a diameter of 0.566 ± 0.007 inches and a cap length of 1/2 inch.
- **No Connection Cap:** Located at the opposite end, this is a black cap with identical physical dimensions (0.566 ± 0.007 inches in diameter and a 1/2-inch cap length) but serves no electrical connection function.
- **Narrow Section:** The narrow section of the tube has a maximum diameter of 9/16 inches.

Gas Filling and Electrical Characteristics

The tube is filled with a mixture of argon gas and a quenching vapor, which allows it to operate as a self-quenching Geiger-Müller counter. The electrical and operating parameters of the 1B71 include:

- **Operating Voltage:** 1150 V D.C.
- **Plateau Region:** The operating plateau extends in excess of 300 V.
- **Plateau Slope:** The slope of the plateau is between 2% and 5% per 100 V, ensuring stable operation even with minor fluctuations in the high-voltage supply.
- **Terminal Capacity:** The capacitance measured at the terminals is 2.4 mmf.
- **Operating Temperature Range:** The tube is rated to operate reliably across a wide thermal envelope from -20°C to +100°C.

Detection Performance and Longevity

The 1B71 is characterized by high sensitivity and rapid recovery times, making it suitable for precise radiation measurement applications. Its performance parameters are defined by the following specifications:

- **Cosmic Ray Efficiency:** Greater than 99%, indicating highly reliable detection of cosmic radiation particles passing through the active volume.
- **Dead Time:** 200 microseconds, which defines the minimum interval required between successive ionizing events for individual detection.
- **Background Count:** An unshielded background rate of approximately 90 counts per minute.
- **Life Expectancy:** The tube has an operational lifetime exceeding 10^8 total counts before degradation of the gas mixture or electrodes affects performance.

Technical Summary

The **1B71** is a specialized, copper-cathode gamma counter tube filled with argon and a quenching vapor. Operating at a nominal potential of 1150 V D.C., it provides a stable plateau exceeding 300 V with a minimal slope of 2% to 5% per 100 V. Physically characterized by its 7-13/16 inch length, dual-cap design (including an active anode terminal and an inactive black cap), and a robust operating temperature range

of -20°C to +100°C, the 1B71 delivers a cosmic ray efficiency greater than 99% and a service life exceeding 10^8 counts.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1953 Amperex

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

1953 AMPEREX

Section 1 · GeigerMullerCounter

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Operating voltage	1150 V	—
Plateau minimum	300 V	—
Dead time approximate	200 us	—

TUBE TINKER

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and their source documents.

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