



ELECTRONIC TUBE REFERENCE

1B102

Specialized - Radiation Counter electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

GEIGERMULLERCOUNTER

Miniature mica-window Geiger-Müller counter designed primarily for beta measurements in laboratory and field instruments. A long self-quenching plateau and windowed construction provide practical sensitivity for portable radiation work.

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

SECTION 0 GeigerMullerCounter*No fixed ratings recorded.*

1B102 — Mica-Window Beta Counter Tube

The **1B102**, also designated as the **1B102 Thyrode**, is a halogen-quenched, mica-window beta counter tube designed to meet both laboratory and field requirements for beta radiation detection. It features a ruggedized design with significantly greater resistance to vibration and shock compared to the [1B67](#).

Construction and Physical Specifications

The 1B102 is constructed with a thin mica window and utilizes a halogen quenching gas. The halogen quench practically eliminates photosensitivity and mitigates the effects of static charges on the window, ensuring stable operation under varying environmental conditions.

Physical Dimensions and Window Properties

- **Window Material:** Mica
- **Window Density:** 2 mg/cm²
- **Active Length:** 1.7 inches
- **Envelope Diameter:** 1.240 inches
- **Base Diameter:** 1-3/8 inches
- **Total Length:** 4-17/32 inches
- **Pin Length:** 0.586 inches

The tube is housed in a cylindrical envelope and is fitted with an RMA medium 4-pin tube base. The base pins have asymmetrical diameters to ensure correct orientation: two pins have a diameter of 0.125 inches, and the other two pins have a diameter of 0.156 inches.

Pinout and Base Connections

The 1B102 utilizes a standard RMA medium 4-pin base configuration. When viewed from the bottom (base view), the electrical connections are assigned as follows:

Pin Number	Connection
Pin 1	Unlabeled / No Connection
Pin 2	Anode (A)
Pin 3	Unlabeled / No Connection
Pin 4	Cathode (K)

Electrical Characteristics

The electrical parameters of new 1B102 tubes are characterized by a well-defined plateau and low background count rate.

Parameter	Specification
Threshold Voltage	Max. 825 V
Plateau Length	Min. 150 V
Plateau Slope	Max. 10% / 100 V (measured from V ₀ = 800 to 1000 V)
Recovery Time	200 μsec
Background Count Rate	40 C/M (at V ₀ = 900 V)
Electrode Capacitance	2.5 μμF

Parameter	Specification
Operating Life	Unlimited by use (tested at 6000 C/M, V ₀ = 900 V)

Operating Ratings and Environmental Limits

The 1B102 is rated for reliable operation under a wide range of environmental conditions, making it suitable for portable field instruments as well as laboratory setups.

- **Operating Voltage Range:** Min. 850 V to Max. 950 V
- **Ambient Temperature Range:** Min. -55 °C to Max. +70 °C
- **Relative Humidity:** Max. 100%

Qualitative Performance and Curve Observations

The performance of the 1B102 is characterized by its counting rate and charge per pulse behavior across its operating voltage range:

- **Counting Rate vs. Voltage (V₀):** The tube exhibits a distinct threshold starting near 800 V. Above this threshold, the counting rate rises rapidly and enters a stable plateau of approximately 6000 to 6500 counts per minute (C/M) between 830 V and 1050 V.
- **Charge per Pulse vs. Voltage (V₀):** The charge per pulse displays a linear increase starting from near 0 Coulombs at 800 V up to approximately 20×10^{-10} Coulombs at 1050 V.

Technical Summary

The **1B102** is a specialized, halogen-quenched beta counter tube featuring a 2 mg/cm² mica window and an active length of 1.7 inches. Housed in a 1.240-inch diameter envelope with an RMA medium 4-pin base, it offers robust resistance to shock and vibration, making it a highly durable alternative to the [1B67](#). Operating within a voltage range of 850 V to 950 V, the tube provides a minimum plateau length of 150 V with a maximum slope of 10% per 100 V. Its halogen fill ensures stable, photosensitivity-free performance across extreme temperatures (-55 °C to +70 °C) and up to 100% relative humidity, delivering virtually unlimited service life for both laboratory and field beta-counting applications.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Victoreen

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

1950 VICTOREEN

Section 0 · GeigerMullerCounter

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
ThresholdVoltage	825 V	Max
Operating Voltage	850–950 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
PlateauLength	150 V	Minimum
PlateauSlope	10 %/100V	Maximum
RecoveryTime	200 us	—
Background	40 counts/min	—
BetaEfficiency	99 %	—
WindowMass	1.7 mg/cm2	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
ElectrodeCapacitance	2.5 pF	—

TUBE TINKER

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