



ELECTRONIC TUBE REFERENCE

100C

Specialized - Radiation Counter electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

GEIGERMULLERCOUNTER

Permanent-sensitivity argon-filled Geiger-Müller counter with a thin mica window for beta and X-ray detection. It operates around 1.2 kV and provides a broad counting plateau with approximately 200 μ s dead time.

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 1 GeigerMullerCounter

No fixed ratings recorded.

Permanent-sensitivity gas-filled radiation counter tube for Beta & X-Ray detection.

100C — Radiation Counter Tube

A permanent sensitivity, self-quenched radiation counter tube designed for the detection and measurement of beta radiation and X-rays.

Overview

The **100C** is a specialized radiation counter tube designed for scientific and industrial radiation detection applications, specifically targeting beta particles and X-rays. It features a robust construction with a stainless steel cathode and a thin mica window that allows low-energy radiation to enter the active volume.

The tube is filled with an argon gas mixture combined with a quenching admixture, enabling self-quenching operation. It operates at a nominal high voltage of **1200 V D.C.** and offers an unlimited operational life expectancy under normal use. The device is rated to operate reliably across a wide temperature range from **-55°C to +75°C**.

Construction and Physical Dimensions

The 100C is engineered with a cylindrical geometry to optimize detection efficiency. Its physical and mechanical specifications include:

- **Cathode Material:** Stainless steel, which provides excellent durability and stable performance over time.
- **Mica Window Thickness:** 0.0005 inches (equivalent to a density thickness of 3.5 mg/cm² or a physical thickness of 12.70 microns). This thin window is critical for minimizing the attenuation of incoming beta particles and X-rays.
- **Effective Window Diameter:** 1-3/32 inches.
- **Effective Cathode Dimensions:** 1-1/2 inches long by 1-3/16 inches outer diameter (O.D.), with a wall thickness of 3/32 inches.
- **Maximum Overall Tube Dimensions:** 1-1/2 inches diameter by 3-3/4 inches length.

Unlike some related variants, the standard 100C does not feature an integrated multi-pin base, allowing for direct connection or custom mounting configurations within its 1-1/2 x 3-3/4 inch envelope.

Electrical and Operating Characteristics

The 100C is a high-voltage gas-discharge detector. Its performance is defined by several key electrical parameters:

Parameter	Specification
Nominal Operating Voltage	1200 V D.C.
Plateau Length	In excess of 300 V
Plateau Slope	5% to 10% per 100 V
Approximate Dead Time	200 microseconds
Maximum Background (Shielded 2" Lead)	50 counts per minute

The wide plateau (exceeding 300 V) ensures that the counting rate remains highly stable even if there are minor fluctuations in the high-voltage power supply. The plateau slope of 5% to 10% per 100 V indicates a well-controlled discharge characteristic. The dead time of approximately 200 microseconds defines the recovery period after an ionization event, during which the tube cannot register subsequent events. For low-level radiation measurements, the background count is kept to a maximum of 50 counts per minute when the tube is housed in a standard 2-inch lead shield.

Related Designations and Comparisons

The 100C is part of a broader family of radiation counter tubes that share physical dimensions but differ in their gas fillings, electrical ratings, or basing styles:

- **100CB**: This variant is electrically and physically identical to the 100C, utilizing the same argon and quenching admixture filling, 1200 V D.C. operating voltage, and 0.0005-inch mica window. However, it is equipped with a **4-pin base**, which increases its maximum overall dimensions to 1-3/8 inches diameter by 4-11/32 inches length.
- **100N**: This tube shares the physical dimensions and window specifications of the 100C but is filled with a **neon and quenching admixture**. Consequently, it operates at a lower nominal voltage of **700 V D.C.** (with a plateau in excess of 200 V) and is designated strictly for beta detection, omitting the X-ray application of the argon-filled 100C.
- **100NB**: The 4-pin based version of the neon-filled 100N, sharing the 700 V D.C. operating voltage and the 1-3/8 x 4-11/32 inch physical envelope of the 100CB.

Technical Summary

The **100C** is an **argon-filled, self-quenched radiation counter tube** featuring a stainless steel cathode and a 1-3/32-inch diameter mica window (0.0005 inches thick). Designed for beta and X-ray detection, it operates at **1200 V D.C.** with a plateau exceeding 300 volts and a slope of 5% to 10% per 100 volts. With an approximate dead time of 200 microseconds, a maximum shielded background of 50 counts per minute, and an unlimited operational life, the 100C provides reliable radiation detection across a temperature range of -55°C to +75°C.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1958 Amperex Industrial

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

1958 AMPEREX INDUSTRIAL

Section 1 · GeigerMullerCounter

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Filling	Argon + quenching admixture	—
Operating voltage	1200 V	DC
Window thickness	0.0005 in	MicaWindow
Window areal density	3.5 mg/cm ²	MicaWindow
Effective mica-window diameter	1-3/32 in	—
Cathode dimensions	1-1/2 long x 1-3/16 OD x 3/32 wall	—
Maximum overall tube dimensions	1-1/2 x 3-3/4	—
Radiation application	Beta & X-Ray	—
Operating temperature range minimum	-55 degC	—
Operating temperature range maximum	75 degC	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plateau length	in excess of 300 V	—
Plateau slope	5% to 10% per 100 V	—
Dead time	200 us	Approximate
Maximum shielded background	50 counts/min	Shielded by 2 inches of lead

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes, and their source documents.

