

# Model 44-9

## Alpha, Beta, Gamma Radiation Detector

*Radiation Detection for a Safer World*



Ludlum Measurements, Inc.

### Introduction

The Ludlum Model 44-9 is arguably the most popular radiation detector used throughout the world for detecting alpha, beta, and gamma radiation. Its size and shape (pancake) provide easy handling for surveying or personnel monitoring. The Geiger-Mueller detector is enclosed within a rugged metal housing with a slip-resistant grip handle. The detector is energy dependent, over-responding by a factor of 6 in the 60 keV to 100 keV range when normalized to  $^{137}\text{Cs}$ .

This detector operates between 850 to 1000 volts, and is compatible with any Ludlum instrument capable of supplying 900 Vdc and an input sensitivity of 30 mV or higher. The GM tube is easily removed for replacement if necessary. Optional filters and configurations are available.



Part Number: 47-1539

### Specifications

**INDICATED USE:** alpha, beta, and gamma survey; frisking, sample counting

**DETECTOR:** pancake-type, halogen-quenched GM

**COMPATIBLE INSTRUMENTS:** general purpose survey meters, ratemeters, and scalers

**WINDOW:**  $1.7 \pm 0.3 \text{ mg/cm}^2$  mica

**WINDOW AREA:**

Active -  $15.51 \text{ cm}^2$  (2.4 in<sup>2</sup>)

Open -  $12.26 \text{ cm}^2$  (1.9 in<sup>2</sup>)

**EFFICIENCY (4 $\pi$  geometry):** 5% for  $^{14}\text{C}$ ; 22% for  $^{90}\text{Sr}/^{90}\text{Y}$ ; 19% for  $^{99}\text{Tc}$ ; 32% for  $^{32}\text{P}$ ; 15% for  $^{239}\text{Pu}$ ;  $\leq 1\%$  for  $^{99\text{m}}\text{Tc}$ ; 0.2% for  $^{125}\text{I}$

**SENSITIVITY:** typically 3300 cpm/mR/hr ( $^{137}\text{Cs}$  gamma)

**ENERGY RESPONSE:** energy dependent, see Ludlum's optional energy filters (*right*) and at <http://www.ludlums.com>

**BACKGROUND:** 60 cpm

**DEAD TIME:** typically 80 microseconds

**OPERATING VOLTAGE:** 900 Vdc

**CONNECTOR:** series "C" (*others available*)

**CONSTRUCTION:** aluminum housing with beige powder-coat finish, and stainless steel protective screen (79% open)

**TEMPERATURE RANGE:**  $-15^\circ$  to  $50^\circ \text{ C}$  ( $5^\circ$  to  $122^\circ \text{ F}$ ); may be certified to operate from  $-40^\circ$  to  $65^\circ \text{ C}$  ( $-40^\circ$  to  $150^\circ \text{ F}$ )

**SIZE:** 4.6 x 6.9 x 27.2 cm (1.8 x 2.7 x 10.7 in.) H x W x L (*other handle lengths are available*)

**WEIGHT:** 0.5 kg (1 lb)

### Also Available

**Model 44-9EXP** Model 44-9 with Exposure Filter (Part Number: 47-3788)

**Model 44-9DOSE** Model 44-9 with Dose Filter installed (Part Number: 47-3789)

**Model 44-9-18** Extended Reach GM detector mounted on gooseneck-type mount provides up to 0.9 m (36 in.) extension (Part Number 47-2940)

**Model 180-2** Sample Holder provides repeatable geometry for counting wipes, filter paper, or slides, for samples up to 4.7 cm (1.8 in.) diameter. (Part Number 47-1665)

The Model 44-9 GM pancake detector has a significant over response at low energies which can be corrected using the snap-on filters offered below (serial #97000 and up):

**Exposure Filter Kit:** flattens the response to within  $\pm 20\%$  referenced to  $^{137}\text{Cs}$  (662 keV) over an energy range of 33 keV to 1.2 MeV (Part Number: 4002-1066)

**Ambient Dose Equivalent Filter:** flattens response to within  $\pm 20\%$  referenced to  $^{137}\text{Cs}$  (662 keV) over an energy range of 20 keV to 1.2 MeV (Part Number: 2002-1050)