

Model 44-9 Alpha, Beta, Gamma Radiation Detector



Model 44-9 showing back view and angled handle



Introduction

The Ludlum Model 44-9 GM (Geiger-Mueller) Detector with angled handle is designed and shaped for easy handling during surveys and monitoring of personnel for alpha, beta, and gamma radiation. A slip-resistant grip, powder-coated metal housing, and protective stainless steel screen contribute to the overall ruggedness of this instrument. The GM tube is easily removed for replaced if necessary. This detector operates between 850-1000 volts, with a recommendation from the tube manufacturer of approximately 900 Vdc. Recommended instrument input sensitivity is approximately 30 mV or higher to prevent the detector from double pulsing (where the detector "counts" a single pulse from the instrument multiple times). The Ludlum Model 44-9 will operate with any Ludlum instruments or equivalent instruments that provide 900 Vdc and an input sensitivity of approximately 30 mV or higher.

The detector is energy dependent, over-responding by a factor of 6 in the 60 keV to 100 keV range when normalized to ^{137}Cs . Snap-on energy compensation filters are available (see below) that will flatten the energy response when exposure or dose measurements are required.

Specifications

Part Number: 47-1539

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

DETECTOR: pancake-type, halogen-quenched GM

COMPATIBLE INSTRUMENTS: general purpose survey meters, ratemeters, and scalars

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

WINDOW AREA: Active - 15.51 cm^2 (2.4 in²); Open - 12.26 cm^2 (1.9 in²)

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

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

ENERGY RESPONSE: energy dependent, see optional energy filters (below) 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° to 50 °C (5° to 122 °F); may be certified to operate from -40° to 65 °C (-40° to 150 °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)

ENVIRONMENTAL RATING: IP (Ingress Protection) rating of 53

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}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}Cs (662 keV) over an energy range of 20 keV to 1.2 MeV (Part Number: 2002-1050)