

**LUDLUM MEASUREMENTS, INC.**

501 OAK ST. / P.O. BOX 810  
SWEETWATER, TEXAS 79556  
Phone: 325-235-5494 800-622-0828 (USA)  
Fax: 325-235-4672 E-Mail: ludlum@ludlums.com  
Website: <http://www.ludlums.com> FEIN 75-1085764

**DESIGNER AND MANUFACTURER  
OF***Scientific and Industrial  
Instruments***Model 78-9 ADDENDUM  
August 2010****GENERAL**

The Model 78-9 is a version of the Ludlum Model 78, replacing the two energy-compensated GM (Geiger-Muller) detectors with a “pancake” GM detector mounted on a flexible cylinder. The detector is removable and has a distinct model number: **Model 44-9-21**. The Model 78-9 uses a black thumbscrew at the end of the “stretch” or telescoping pole that serves to fix the detector in place. When the telescoping pole is opened or closed, it is important to loosen the black thumbscrew to provide relief to the internal cable.

**Skipping this step will result in premature failure of the internal cable.**

The Model 78-9 electronics are also very similar to the Model 78, but the analog meter is removed. The Model 78-9 has a toggle switch that allows the user to change the digital auto-ranging display from cps to  $\mu\text{Sv/h}$ . Note that a pancake detector is not energy compensated, and over-responds to photon energies around 100 keV. Specifications for the GM detector are shown below:

**MODEL 44-9-21 SPECIFICATIONS:**

- **Efficiency ( $4\pi$  geometry):** typically 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  $^{99m}\text{Tc}$
- **Sensitivity:** typically 3300 cpm per mR/hr ( $^{137}\text{Cs}$  gamma)
- **Energy Response:** energy dependent (please see graphs on Page 7)
- **Background:** 60 cpm
- **Dead Time:** typically 80  $\mu\text{s}$
- **Window:**  $1.7 \pm 0.3 \text{ mg/cm}^2$ ; open is  $12 \text{ cm}^2$
- **Detector:** pancake-type, halogen-quenched GM
- **Detector Operating Voltage:** 900 Vdc
- **Compatible Instruments:** general purpose survey meters, ratemeters, and scalers
- **Connector:** Series “C” (others available)
- **Construction:** aluminum housing with beige powder-coat finish; stainless steel protective screen (79% open)
- **Temperature Range:** -15 to 50  $^{\circ}\text{C}$  (5 to 122  $^{\circ}\text{F}$ ); may be certified for -40 to 65  $^{\circ}\text{C}$  (-40 to 150  $^{\circ}\text{F}$ )

All the other controls are the same as shown in the Model 78 manual.