

Did You Know We Offer Waterproof G-M Detectors ??

September
1995



WATERPROOF DETECTORS

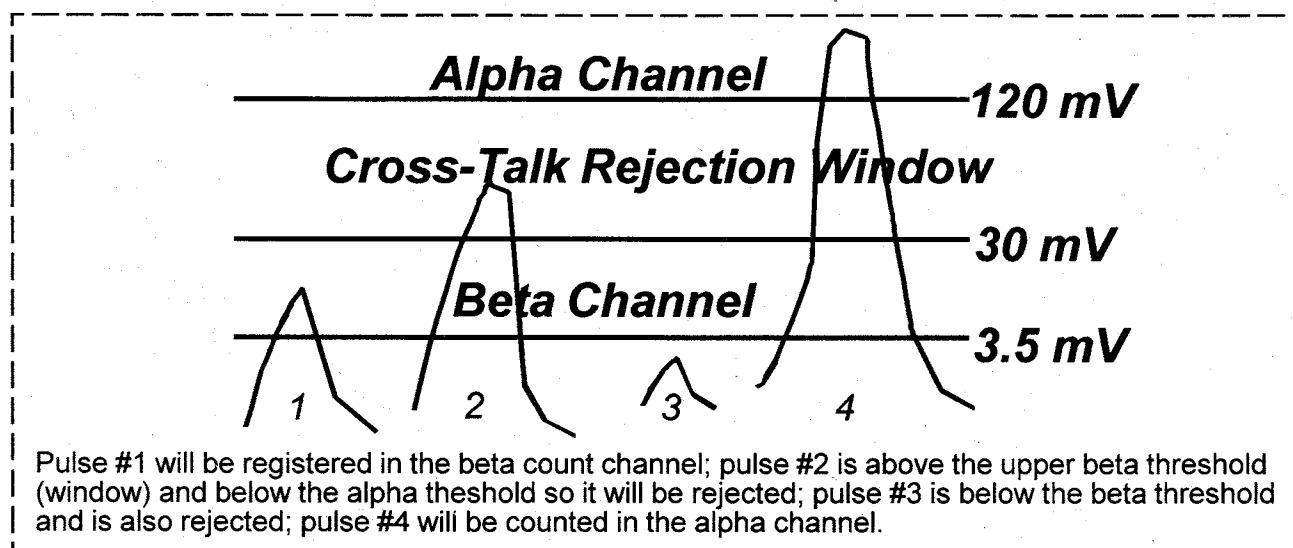
Det.	Useful Range	Sensitivity	Energy Response	Operating Voltage	PRICES
133-2-1	.05 mR/h to 200 mR/h	1000 cpm/mR/h (Cs-137 gamma)	Within ± 15% of true value	550 Volts	\$182.00 255.00
133-4-1	.25 mR/h to 1 R/h	100 cpm/mR/h (Cs-137 gamma)			\$257.00 240.00
133-6-1	1 mR/h to 6 R/h	30 cpm/mR/h (Cs-137 gamma)			\$257.00 280.00
133-7-1	10 mR/h to 300 R/h	4.2 cpm/mR/h (Co-60 gamma)	Within ± 25% of true value	460 Volts	\$278.00 280.00
133-8-1	0.1 R/h to 1000 R/h	0.7 cpm/mR/h (Co-60 gamma)			\$288.00 370.00

- * Compatible with any Ludlum Instrument.
- * Tested to a depth of 100 feet.
- * Price includes 100 foot "C" cable (other connectors available).

DETERMINING ALPHA/BETA DETECTOR OPERATING PARAMETERS

Determining alpha/beta scintillation and/or proportional detector operating voltage, counter thresholds, and window parameters requires an understanding of the mechanics involved in simultaneous alpha/beta discrimination. The parameters involved in determining the alpha/beta detector operating points are: maximum alpha and beta efficiency, minimizing background count and "cross-talk" between alpha and beta counting channels, and uniformity across the detection area.

The counter — Ludlum Model 2224 used in this example — simultaneously counts and discriminates the alpha and beta pulses from the phoswich scintillator or proportional detector. The counter incorporates a lower and upper beta threshold (referred to as beta window) and an alpha threshold. The thresholds are adjustable and are typically set: beta threshold 3.5 = millivolts (mV), beta window = 30 mV, and alpha threshold = 120 mV. Detector operating voltage (HV) is adjusted to increase or decrease the pulse amplitude above and below the thresholds to optimize count efficiency and particle discrimination.



The alpha to beta pulse amplitude differential is primarily produced by the detector. Proportional detectors will differ from scintillators and detectors may differ from design and manufacturer. Detector HV (coarse adjust) and counter thresholds (fine adjust) can be varied to optimize counting efficiency versus particle cross-talk. The threshold settings illustrated above have found to be the optimum parameters for the Ludlum Model 43-89 Alpha/Beta Scintillator and the Model 2224 Scaler/Ratemeter. The "cross-talk rejection window" between the beta window and the alpha threshold reduces alpha to beta and beta to alpha cross-talk. Ludlum alpha/beta detectors and counters specify cross-talk at $\leq 1\%$ beta's in the alpha count channel and $\leq 10\%$ alpha's in the beta count channel. These parameters are defined as:

Beta cross-talk in alpha channel (typically $\leq 1\%$) =

$$\frac{\text{beta source count in alpha channel} - \text{background count in the alpha channel}}{\text{net beta source count in beta channel}} \times 100$$

Alpha cross-talk in beta channel (typically $\leq 10\%$) =

$$\frac{\text{alpha source count in beta channel} - \text{background count in the beta channel}}{\text{net alpha source count in alpha channel}} \times 100$$

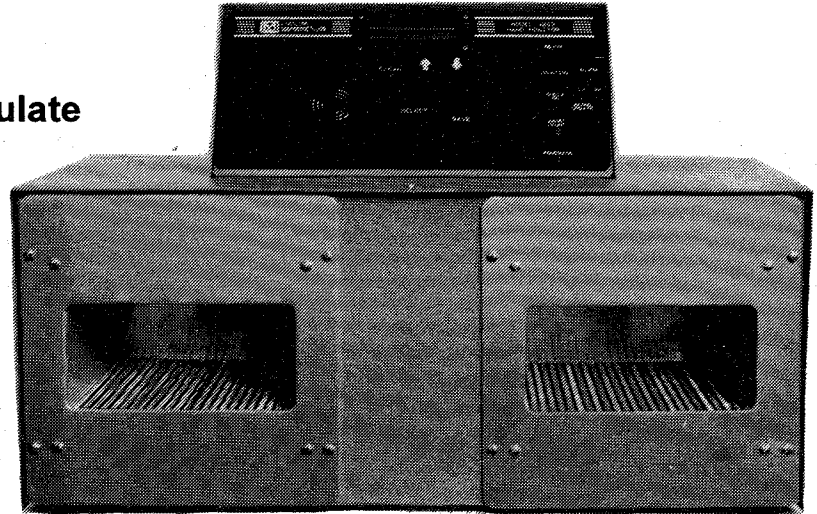


MODEL 4903 HAND MONITOR



FEATURES

- Automatic background accumulate and subtract.
- Beta/Gamma Detection
- Simple LED status indicators
- Parameters stored in non-volatile memory
- Price \$ 2,750.00



The Model 4903 Beta/Gamma Hand Monitor is intended for use as a medium to high level contamination monitor.

The Model 4903 employs four ¹ pancake G-M type detectors. Pancake tubes are shielded with a 1/4" lead shield for use in high background areas. Two detectors are summed for the right-hand and two for the left-hand. LED indicators show status and alarm location. The Model 4903 allows parameter updating by viewing the 16 character LCD display. Detector counts, background and all parameters may be viewed on the LCD display.

Switches in each hand cavity initiate the interrogation. Audible alarm and status change indications are standard. ¹(Units having more detectors are available upon request)

SPECIFICATIONS

Weight: 25 lbs.
Dimensions: 13" tall x 21" wide x 12.75" deep
Power: 102-132 VAC, 50/60 Hz, 50 watts maximum
Detector Efficiency (4 pi): 10% Tc-99
 9% Cs-137 (beta/gamma)
Counting Capacity: 9999 counts per period
Count Time: Adjustable from 1 to 60 seconds
Alarm Hold Time: Adjustable from 1 to 99 seconds

Audio: Unimorph speaker with keypad adjustable volume
Background Count Time: Automatic (adjustable from 1 to 60 seconds)
Background Update Interval Timer: Adjustable from 1 to 99 minutes
Forced Background Update Interval Timer: Adjustable from 1 to 99 minutes

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