

Model 2363 with Model 42-41L Neutron Dose Ratemeter

Radiation Detection for a Safer World



Ludlum Measurements, Inc.

FEATURES

- Lightweight Neutron Detection System
- Independent Gamma and Neutron Measurements
- Scaler & Data Logging Capabilities
- Neutron Detection Range: 0.1 mrem/hr to 1 Rem/hr
- Gamma Detection Range: 0.1 mR/hr to 1 R/hr



Part Number: 48-3514

Introduction

This gamma/neutron detection system combines Ludlum Model 2363 survey meter with the Model 42-41L PRESCILA neutron detector. The gamma detector is an energy-compensated GM housed internally to the survey meter. The neutron detector is a proton recoil scintillator type, which provides excellent measurement results at less weight than the more traditional REM balls.

Specifications

INDICATED USE: gamma and neutron survey

RANGE: four linear range multiples of x0.1, x1, x10, and x100; used in combination with the 0-10 mrem/hr meter dial, providing an overall range of 0-1000 mrem/hr

SENSITIVITY (approximately): gamma:1000 cpm/mR/hr (internal detector); neutron: 350 cpm/mrem/hr (with Model 42-41L)

HIGH VOLTAGE: neutron adjustable from 500 to 1500 Vdc; gamma fixed at 550 Vdc

THRESHOLD: neutron adjustable from 5 to 100 mV; gamma fixed at 50 millivolts (mV)

LINEARITY: within 10% of true value for the analog ratemeter; 2% for the LCD

ADJUSTABLE ALARMS (indicated by front panel LEDs): gamma, neutron, integrated dose

DATA LOGGER: capable of logging up to 1000 individual data points each with the following identifiers: gamma and neutron sample counts, sample number, date/time stamp, current integrated dose, 10-character location identifier (All data is stored in non-volatile memory, allowing batteries to be removed without loss of data.)

AUDIO: dual- or single-tone click-per-event through built-in speaker with adjustable volume located on the front panel; headset jack located on the instrument can

RS-232 PORT: allows instrument to be connected to a PC for data download and adjustment of setup parameters

FINISH: drawn-and-cast aluminum with beige (meter) or black (Model 42-41L detector) powder coating

METER: rugged 1 milliamp (mA), with pivot-and-jewel suspension and 6.4 cm (2.5 in.) arc

METER DIAL: 0 to 10 mrem/hr, BAT OK

DIGITAL DISPLAY: 6-digit LCD with 0.64 (0.25 in.) digits

SELECTOR SWITCH: toggle switch to select gamma+neutron, gamma only, or neutron only

RESET/READ HV: two-position switch momentary action switch to reset the meter or read current integrated dose

RESPONSE: varies according to number of counts present, typically 2 to 11 seconds from 10 to 90% of final reading

DETECTOR CONNECTOR: type "C" series (others available)

TEMPERATURE RANGE:

Neutron: $\pm 30\%$ from 0 to 40 °C (32 to 104 °F) (PRESCILA)

Gamma: $\pm 10\%$ from -20 to 50 °C (-4 to 122 °F) (internal GM)

POWER: two standard "D" cell batteries (housed in externally accessible sealed compartment)

BATTERY LIFE: 200 hours of operation with a fresh set of alkaline "D" cell batteries

SIZE (including connector protrusion):

Without PRESCILA: 19.6 x 8.9 x 21.1 cm (7.7 x 3.5 x 8.3 in.) (H x W x L)

With PRESCILA: 32.3 x 13.7 x 34.3 cm (12.7 x 5.4 x 13.5 in.) (H x W x L)

WEIGHT (including internal detector and batteries):

Without PRESCILA With PRESCILA

2.0 kg (4.5 lb) 4.2 kg (9.2 lb)

Model 42-41L Neutron Detector



Ludlum Measurements, Inc.



Part Number: 47-3309

Introduction

The Ludlum Model 42-41L PRESCILA Neutron Detector is a viable and ergonomically superior alternative to traditional REM-ball designs for handheld radiation surveys, proven through extensive performance and field testing by the Health, Safety, and Radiation Protection Division of Los Alamos National Laboratory (LANL). This detector features a low-weight probe capable of excellent sensitivity of 35 cpm for $^{241}\text{AmBe}$ and extended energy response to over 20 MeV. Directional response is uniform ($\pm 15\%$) over a wide range of energies. Response linearity has been characterized to a dose rate exceeding 20 mSv h^{-1} and can be extended to 2 mSv h^{-1} when using dynamic gamma compensation. Gamma rejection is effective in gamma fields up to about 1 mSv h^{-1} , and can be extended to 2 mSv h^{-1} when using dynamic gamma compensation.



Model 42-41L with Model 2363
Neutron Dose Rate Meter

Specifications

INDICATED USE: neutron survey and dose measurement
DETECTOR: PRESCILA proton recoil scintillator
PHOTOMULTIPLIER TUBE: 2.9 cm (1.13 in.) diameter
SENSITIVITY: approximately 350 cpm/mrem/hr ($^{241}\text{AmBe}$)
NEUTRON ENERGY RESPONSE: thermal to 100 MeV
ANGULAR DEPENDENCE: within 15% over a wide range of energies
GAMMA REJECTION: approximately 400 cpm at 100 mR/hr with (^{137}Cs)
TYPICAL BACKGROUND: approximately 12 cpm (0.05 mrem/hr)
OPERATING VOLTAGE: typically 500 to 700 volts
DETECTOR CONNECTOR: type "C" series (others available)
CONSTRUCTION: aluminum housing with black powder coat finish and foam grip
TEMPERATURE RANGE: temperature dependant
SIZE: 25.7 x 10.8 x 10.8 cm (10.1 x 4.3 x 4.3 in.) (H x W x L)
WEIGHT: 2.2 kg (5 lb)