

Model 3014 with Model 42-41L Neutron Dose Survey Meter

Part Number: 48-4507

Features

- Lightweight Neutron Detection Meter
- Internal GM Detector for Gamma Dose Measurements
- Rate, Max, Count, and Integrated Dose Modes
- Large Backlit LCD for Ease of Reading
- 4-Button Intuitive Interface for Easy Operation
- 1-Button Handle Interface for Data Logging
- Digital Calibration, Data Logging, Auto-Ranging, USB Connectivity
- Bluetooth, True RS-232, and Headphone Options
- Alternative to Ludlum Model 2363 with Model 42-41L



Introduction

The Model 3014 with the Model 42-41L is a durable, lightweight instrument designed for neutron and gamma radiation survey. The Model 42-41L PRESCILA detector, a lighter weight alternative to traditional rem ball detectors, is used to measure neutron radiation, and an internal GM detector is used for measuring gamma radiation. The meter features a large, easy-to-read LCD screen and audible alarms and is controlled using a simple five-button interface. High-impact plastic housing and splash-resistant construction allows the instrument to be used outdoors.

Four modes of operation are available – RATE, MAX, DOSE, and COUNT – which can be selected by pressing the MODE button. Measurements can be collected in two sets of units (primary and secondary) for RATE and MAX modes. The user can switch between the two sets of units by pressing the UNITS button. Pressing the DETECTOR button toggles the display between the internal GM detector and external Model 42-41L detector readings. When enabled with the Lumic

Data Logger Kit (see options), data can be logged in any of the operational modes using the LOG button on the handle. Up to 1000 data points can be stored internally.

Instrument setup can be done either through the front-panel controls or via the Lumic Calibration Kit (see options). The Model 3014 and Model 42-41L is shipped ready to use with batteries and calibration certificate.

Options

- Lumic Calibration Kit (PN: 4519-865)
- Lumic Data Logger Kit (PN: 4498-1019)
- Headphone Jack (PN: 4498-555)

Data Output Options (Only one can be selected.)

- Bluetooth® Option (PN: 4519-564)
- RS-232 Serial Port (PN: 4519-594)
- TTL Serial Port (PN: 4519-595)

Specifications

EXTERNAL DETECTOR: Model 42-41L PRESCILA neutron detector
Sensitivity ($^{241}\text{AmBe}$): 35 cpm per $\mu\text{Sv/h}$ (350 cpm per mrem/hr)

Neutron Energy Response: thermal to 100 MeV neutrons

Gamma Rejection (^{137}Cs): approx. 400 cpm at 100 mR/hr

INTERNAL DETECTOR: energy compensated GM detector

Sensitivity (^{137}Cs): 100 cpm per $\mu\text{Sv/h}$ (1000 cpm per mR/hr)

MEASUREMENT RANGE:

Neutron: 1 $\mu\text{Sv/h}$ to 10 mSv/h (0.1 mrem/hr to 1 rem/hr)

Gamma: Background to 50 mSv/h (5 R/hr)

HIGH VOLTAGE:

Neutron: typically 500 to 700 Vdc

Gamma: 550 Vdc

LINEARITY: readings within 10% of true value

MODES: four operational modes including rate, max, count, and integrated dose

DISPLAY: 3-digit auto-ranging LCD with large 20 mm (0.8 in.) digits. Units: (k)(M)c, (k)cps, (k)(M)cpm, (k)(M)d, (k)(M)Bq, (k)(M)Bq/cm², (k)(M)dpm, (μ)(m)(k)(M)R, (μ)(m)(k)R/h, (μ)(m)(k)(M)Sv, (μ)(m)Sv/h, (μ)(m)(k)(M)Rem, (μ)(m)(k)Rem/h. Indicators: bar graph, radiation type (alpha (α), beta (β), gamma (γ), neutron (n)), mode (MAX, INTG), three alarm levels (ALARM 1, 2, 3), fault messages (FAULT, OVERLOAD, LOSS OF COUNT, OVERRANGE), USB, wireless, audio, and low-battery.

DISPLAY RANGE:

- | | |
|--|---|
| • 00.0 cps to 999 kcps | • 0.00 μSv to 999 MSv |
| • 00.0 cpm to 99.9 Mcpm | • 0.00 $\mu\text{Sv/h}$ to 999 Sv/h |
| • 00.0 Bq to 999 MBq | • 0.00 μRem to 999 MRem |
| • 00.0 Bq/cm ² to 999 MBq/cm ² | • 0.00 $\mu\text{Rem/h}$ to 9.99 kRem/h |
| • 00.0 dpm to 999 Mdpm | • 0 c to 999 Mc (counts) |
| • 0.00 μR to 999 MR | • 0 d to 999 Md (disintegrations) |
| • 0.00 $\mu\text{R/h}$ to 9.99 kR/h | |

NOTE: Operational display ranges are dependent on the detector and dead time configuration. The minimum and maximum display can be set to limit the display to the calibrated range.

BACKLIGHT: built-in ambient light sensor automatically activates LED backlight unless internal dipswitch is set to continuous-on

USER CONTROLS:

- ON/AUD: Extra-long press to turn ON; Short press to adjust audio level; Extra-long press to turn OFF
- UNITS: Short press changes the units between count rate, dose/exposure, or disintegration
- DETECTOR: Short press to change between the external and internal detector

- MODE: Short press alternates between modes: RATE (displays count rate), MAX (captures peak rate), COUNT (user-selectable preset count time from 0 to 31.68 years), and DOSE (current accumulated dose)
- LOG: Short press to log current display (requires Lumic Data Logger Kit) or initiate count in COUNT mode, an extra-long press to change count in COUNT mode

DATA LOGGING: Can store up to 1000 data points internally. Requires Lumic Data Logger Kit (see below)

RESPONSE TIME: user-selectable from 1 to 60 seconds, auto SLOW, auto FAST, fixed SLOW (22s), fixed FAST (4s)

ALARMS: three count rate, exposure/dose, count, and accumulated dose alarm set-points adjustable over the display range

SELF-DIAGNOSTICS: detects and reports internal instrument issues, indicated by graphic FAULT display and audio warning

OVERLOAD PROTECTION: high count rate saturation protection prevents false display of lower count rates. OVERLOAD will appear on the display and an audio warning will be triggered.

LOSS OF COUNT PROTECTION: after a user defined time, typically 60 seconds, of no pulses from detector, the unit will flash a zero reading, an audio alarm will be triggered, and LOSS OF COUNTS will appear on the display

OVERRANGE: if reading should exceed the predefined detector range, the unit will flash a maximum reading, an audio warning will be triggered, and OVERRANGE will appear on the display

AUDIO: "click" audio greater than 65 dB at 0.6 m (2 ft), alarm audio greater than 72 dB at 0.6 m (2 ft), approximately 4.5 Hz

CALIBRATION PROTECTION: internal dipswitch to disable front-panel calibration parameter changes

POWER: four "AA" batteries

BATTERY LIFE: approximately 175 hours of operation, 16-hour low battery warning

CONSTRUCTION: high-impact polycarbonate with rubber seals and separate battery compartment

TEMPERATURE RANGE: -20 to 50 °C (-5 to 122 °F), may be certified for operation from -40 to 65 °C (-40 to 150 °F)

ENVIRONMENTAL RATING: NEMA 3x, IP 53

OVERALL SIZE (H x W x L): 31.1 x 12.5 x 33.2 cm (12.3 x 4.9 x 13.1 in.)

WEIGHT:

With Model 42-41L: 3.5 kg (7.7 lb)

Without Model 42-41L: 1.4 kg (3 lb)