

Gamma Contamination and Dose Rate Monitor

Radiation Detection Division

Health Physics



The RAM GENE-1 mark II model is the latest edition to the successful line of GENE instruments produced by Rotem. We have upgraded the basic reliable model to be compliant to applications which demand a rugged instrument for harsh environments.

Ideal for Emergency Response Teams, Ambulance Services and the Police force.

The RAM GENE-1 mark II features a specially designed energy filter embedded in the cap for ambient dose equivalent dose rate radiation monitoring down to 17keV, with the additional flexibility of a contamination meter.

The RAM GENE-1 is equipped with a recessed, internal GM pancake detector using a thin mica window protected by a stainless-steel screen. The transition between measuring radiation dose rate and contamination is achieved with the aid of a mechanical switch on the detector housing which is activated by either removing or replacing the plastic cap

Features

- External power input which can also be used to charge appropriate batteries
- Aluminum case with splash resistant keypad
- Backlight for easy reading in unfriendly environments
- Large, four-digit, continuous ranging, LCD display
- Simple, three key operation
- Large 1.75" pancake GM detector
- Suitable for alpha, beta or gamma contamination detection
- Unit readouts of count rate:
(CPS in contamination mode and (μ Sv/hr) in dose mode.
- Audible and visual (LED) count rate indication
- Smart Firmware provides fast, yet stable response
- Alarms for overflow, low battery and detector failure
- Automatic self diagnostic routines

Technical Data

Measuring Range: 0.05 $\mu\text{Sv/h}$ to 7000 $\mu\text{Sv/h}$ (0.05mR/h to 700mR/h)

Accumulated Dose up to 9,999 (μSv or mR)

Sensitivity: Approximately 5.8 cps/ $\mu\text{Sv/hr}$ (58 cps/mR/hr) - ^{137}Cs

Detector: 1.75" Pancake GM tube - LND73118 or equivalent

Window: Mica, 1.5 - 2.0 mg/cm^2 protected by stainless steel mesh

Display Resolution: 0.0.1 $\mu\text{Sv/h}$ (0.001mR/h)

Background: 0 - 1 cps

Count Range: 0 - 42,000 cps

Display: Large, four-digit, continuous ranging

Units: CPS or CPM and $\mu\text{Sv/h}$ or mR/h

LCD readout for display of count rate, dose rate, overflow, low battery, and detector failure

LED: Flashing count rate indication

Audio: Piezo electric element synchronized with count LED

Controls: Three key keypad with positive feedback for ON/OFF

Key combinations for selecting count rate or dose rate unit displays

Power: Standard 9V alkaline battery - provides approximately 50

hours continuous use with speaker off

Automatic battery check under full load.

External power input can also be used to charge appropriate batteries

Temperature Range: Operation: -10°C to $+50^{\circ}\text{C}$ (15°F to 122°F)

Storage: -20°C to $+60^{\circ}\text{C}$ (-5°F to 140°F)

Humidity Range: 40% to 95% RH (non-condensing)

Case: High impact ABS

Dimensions: 11cm x 6.7cm x 7.4cm (4.3" x 2.6" x 2.9")

Weight: 0.565 Kg (1.25 lbs)

Variation of Response with Particle Energy

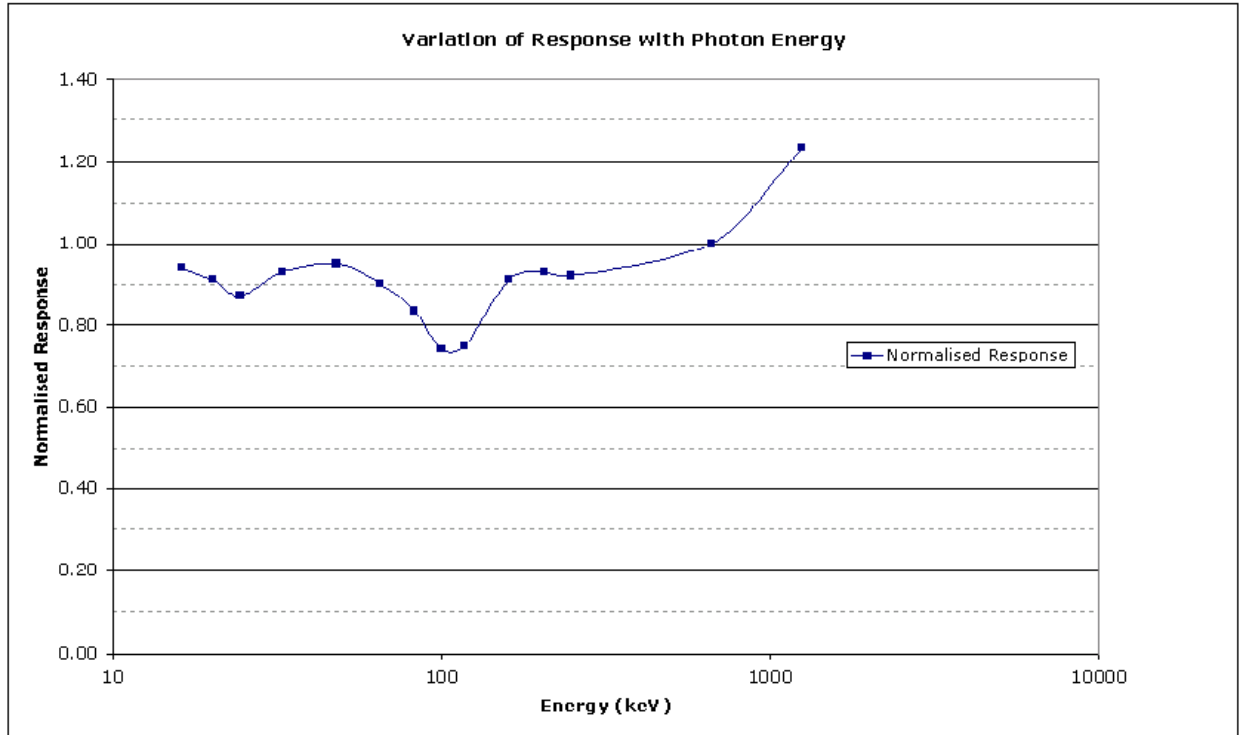
- $E_{\text{max}} < 0.2 \text{ MeV}$ – ^{14}C
- E_{max} between 0.2 MeV and 0.5 MeV – ^{147}Pm and ^{60}Co
- $E_{\text{max}} > 0.5 \text{ MeV}$ - ^{36}Cl and $^{90}\text{Sr}/^{90}\text{Y}$

Nuclide	Activity (Bq cm^{-2})	Instrument Indication (counts s^{-1})	Response Factor	Uncertainty
$^{90}\text{Sr} + ^{90}\text{Y}$	70.55	277	3.92	$\pm 10\%$
^{36}Cl	35.84	135	3.78	$\pm 10\%$
^{60}Co	34.62	56	1.63	$\pm 10\%$
^{147}Pm	18.65	19.6	1.05	$\pm 10\%$
^{14}C	142.64	143	1.00	$\pm 10\%$
^{241}Am	21.57	27.2	1.26	$\pm 10\%$
^{238}Pu	21.54	27.9	1.30	$\pm 10\%$

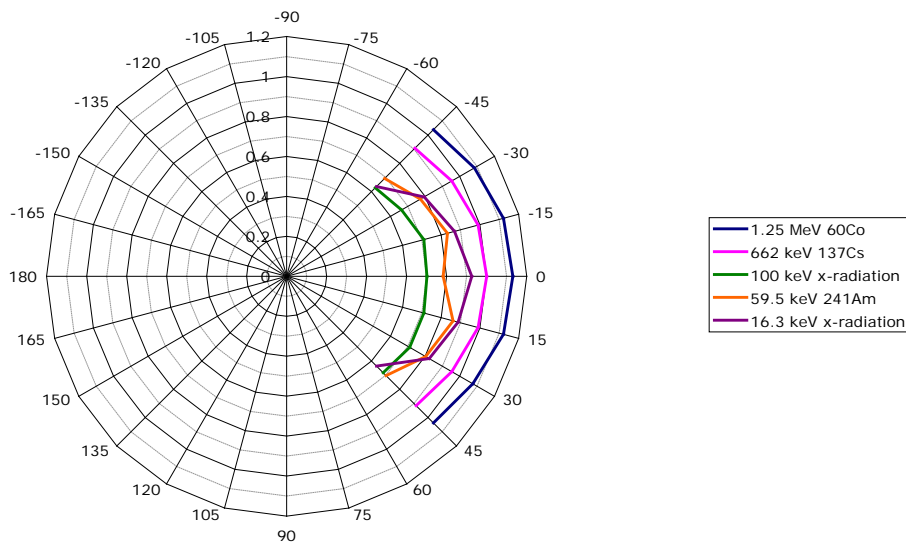
ROTEM INDUSTRIES reserves the right to change specifications without advance notice

Technical Data

Compliant to IEC 60846 and IEC 60325 for ambient dose equivalent and contamination monitoring

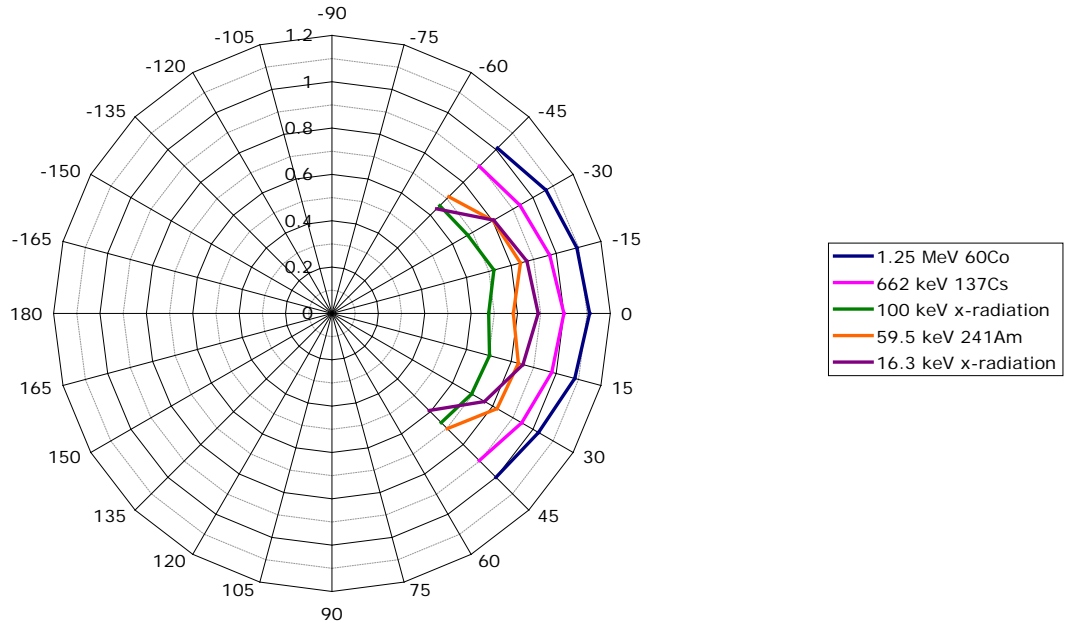


Horizontal Polar Response



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Vertical Polar Response



Full Energy Response Data

Radiation Quantity	Energy (keV)	Normalized Response	Uncertainty
⁶⁰ Co γ -radiation	1250	1.17	$\pm 10\%$
¹³⁷ Cs γ -radiation	662	1	$\pm 10\%$
ISO Low series x-radiation	248	0.92	$\pm 10\%$
ISO Low series x-radiation	205	0.93	$\pm 10\%$
ISO Low series x-radiation	161	0.91	$\pm 10\%$
ISO Low series x-radiation	118	0.75	$\pm 10\%$
ISO Low series x-radiation	100	0.74	$\pm 10\%$
ISO Low series x-radiation	83	0.83	$\pm 10\%$
ISO Low series x-radiation	65	0.9	$\pm 10\%$
²⁴¹ Am γ -radiation	59.5	0.94	$\pm 10\%$
ISO Low series x-radiation	48	0.95	$\pm 10\%$
ISO Low series x-radiation	33	0.93	$\pm 10\%$
ISO Low series x-radiation	24.5	0.87	$\pm 10\%$
ISO Low series x-radiation	20.2	0.91	$\pm 10\%$
ISO Low series x-radiation	16.3	0.94	$\pm 10\%$

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