# GammaRAE II R

## Radiation Detector and Dosimeter in One

## Gamma radiation detector and full-range dosimeter in a single instrument

GammaRAE II R is two instruments in one: it has the rapid response of a detector and the accurate dose measurement of a dosimeter. It is designed specifically to meet the needs of first responders.

### Detector Meets Dosimeter

The GammaRAE II R contains two separate sensors. The Cesium Iodide (CsI) scintillator provides a fast, two-second response to radiological threats, while the energy-compensated PIN diode provides high dose rate range coverage and accurate dose measurements.

### Loud Alarm

GammaRAE II R alerts the wearer with a loud audible alarm, big, bright flashing LEDs, and a built-in vibration alarm. For stealth operations, users can disable each alarm individually.

### Water Resistant

Immersible (IP67) design makes for reliable operation in wet environments and easy decontamination.

### Dose Accumulation

The GammaRAE II R accumulates accurate total dose. Stored dose data can be cumulative or reset for each use period.

### Intrinsic Safety (IS)

IS certification permits operation in potentially flammable/explosive environments.

## Key Features

- Sensitive CsI scintillator for excellent search capability and fast response

- Energy-compensated PIN diode sensor for high dose rate range and accurate dosimeter capabilities

- Prominent visible, audible and vibration alarms

- Immersible in water for easy decontamination

- Top-mounted, invertable display

- Continuous digital readout in Rem/hour ($\mu$R/h & mR/h) or in Sievert/hour ($\mu$Sv/h & mSv/h) and counts-per-second (cps)

- Two operation keys, simple intuitive programming

- Long calibration life

- Two AA alkaline batteries last up to 900 hours

- Large, 30,000-point datalog capacity, downloaded via cable-free Bluetooth® connection

## Applications

- Alerts first responders to radioactive threats

- Accurately measures accumulated dose to the wearer

- Customs & border patrols

- Law enforcement

- Security officers in nuclear power facilities, banks, government laboratories, medical facilities

- Military

- Government agencies

- HazMat teams

- Fire departments

**Combined Detector and Dosimeter**

**Intrinsically Safe**

**Immersible**

GammaRAE II R

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ATEX    c(SP)us    CE    ISO 9001 CERTIFIED

RAE SYSTEMS

# GammaRAE II R

## Specifications*

### Detector Specifications

| SENSOR | |
|---|---|
| Radiation Sensors | 3cc CsI(TI) with Photodiode (Low channel) Energy-Compensated PIN Diode (High channel) |
| Energy Range | 0.06 to 3.0 MeV |
| Dose Equivalent Rate (DER) Range for $^{137}$Cs | 1 $\mu$R/h to 10 R/h (0.01 $\mu$Sv/h to 0.1 Sv/h) |
| Accuracy of DER | ±20% |
| Dosage Range | 1 $\mu$R to 999.9 R (0.01 $\mu$Sv to 9.9 Sv) |
| Background Reference | Background level reference automatic on start-up (Search Mode only), plus user-initiated as needed |
| Calibration | None required. Periodic functional test recommended using 1 $\mu$Ci and 16 $\mu$Ci $^{137}$Cs check sources. Factory calibration available if needed. |

| ALARMS | |
|---|---|
| Time to Alarm | <2 seconds |
| Alarms | • Loud audible buzzer (85+ dB @ 30 cm) • Built-in vibration alarm • Highly visible LED lights on both sides of LCD graphic display |
| Alarm Settings | **Search Mode:** Alarm threshold based on variations in local background level **Safety Mode:** User-programmable low and high alarm thresholds based on dose rate |

| DATALOGGING AND COMMUNICATION | |
|---|---|
| Datalog Size | 30,000 data points (20 days at 60-second intervals) |
| Datalog Modes | **Continuous:** Logs data at all times **Event-Driven:** Starts logging data on alarm |
| Datalog Interval | User programmable, 1 to 3,600 seconds |
| Communication | Built-in Bluetooth® radio interfaces with computer for datalog download and configuration changes |

| POWER | |
|---|---|
| Battery | 2 AA alkaline batteries |
| Operating Period | Up to 900 hours |

| OPERATING ENVIRONMENT | |
|---|---|
| Temperature | -20°C to 50°C (-4°F to 122°F) |
| Temperature Alarm | Temperatures above 50°C (122°F) will cause a high-temperature error message |
| Humidity | 0% to 95% (non-condensing) |
| Shock Resistance | Passes drop test from 1.5m (59") |
| IP Rating | IP67 (immersible) |
| Intrinsic Safety | Certified to meet Class I, Div. I, Groups A, B, C, D, T4 |
| | ATEX II IG EEx ia IIC T4 |

| PHYSICAL CHARACTERISTICS | |
|---|---|
| Display | Graphic LCD with 1.2" x 0.75" (30.5 mm x 19 mm) viewable area can be flipped for view by user; Radiation intensity displayed in cps or dosage rate in divisions of R/h or Sv/h |
| Direct Readout | Dose rate, peak, min, total dose, battery status, time, temperature |
| Ergonomics | Nonslip rubber housing with grippable ridges securely fits hand or glove |
| Keypad | 2 operation/program buttons |
| Size | 4.92" x 2.68" x 1.38" (125 x 68 x 35 mm) |
| Weight | 9.5 oz (270g) |
| Attachments | Rugged metal belt clip and wrist strap |

## Kit includes:

- GammaRAE II R personal radiation detector/dosimeter
- Belt clip
- 2 AA alkaline batteries
- Wrist strap
- User's Guide
- Calibration certificate
- ProRAE Studio Radiation software



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**www.raesystems.com**

**RAE** SYSTEMS

# NeutronRAE II
## Personal Radiation Detector

## An intrinsically safe, rapid detector of γ-ray (gamma) and neutron sources

**NeutronRAE II** is the first personal radiation detector to provide rapid detection of both gamma (γ) ray and neutron sources even in potentially flammable environments. Certified intrinsically safe and water-immersible for chemical decontamination purposes, the **NeutronRAE II** can be safely used in more environments than any other personal gamma and neutron radiation detector.

### Fast Response

The sensitive Cesium Iodide (CsI) and Lithium Iodide (LiI) scintillators of the **NeutronRAE II** provide a fast response to radiological threats.

### Loud Alarm

**NeutronRAE II** alerts the wearer with a loud 85+ dB alarm, big, bright flashing LEDs, and a vibration alarm. For stealth operations, law enforcement personnel can disable each alarm individually.

### Water Resistant

Immersible (IP67) design makes for reliable operation in wet environments and easy decontamination.

### Dosage Accumulation

The **NeutronRAE II** accumulates approximate total dosage from gamma radiation. Stored dosage data can be cumulative or cleared and reset for each use period.

### Intrinsic Safety (IS)

IS Certification permits operation in potentially flammable/explosive environments.

## Key Features

- Detects neutrons from weapons-grade Plutonium ($^{239}$Pu)

- Detects gamma rays from potential "dirty bomb" materials

- Sensitive CsI and LiI scintillators for excellent search capability and fast response

- Prominent visible, audible and vibration alarms

- Immersible in water for easy de-contamination

- Top-mounted, invertable display

- Continuous digital readout in µR/h (µRem/h), µSv/h (µSieverts/h) and cps (counts per second) for gamma; cps (counts per second) for neutron radiation

- Two operation keys, simple intuitive programming

- Dust and shock resistant

- Long calibration life

- Two AA alkaline batteries last up to 600 hours

- Automatic background level referencing on start-up and upon user demand (mode dependent)

- Passes drop test from 59" (1.5m) to hard concrete

- Low EMI interference from cell phones and portable radios

- Programmable gamma and neutron search and high and low gamma safety alarms

## Applications

- Alert First Responders to radioactive threats

- Customs & border patrols

- Law enforcement

- Security officers in nuclear power facilities, banks, government laboratories, medical facilities

- Military

- Government agencies

- HazMat teams

- Fire Departments

ISO 9001 ✔
CERTIFIED

## Specifications*

### Detector Specifications

| SENSOR | |
|---|---|
| **Radiation Detector** | Gamma: CsI(TI)/Photodiode<br>Neutron: LiI(Eu)/Photodiode |
| **Energy Range** | Gamma: 0.06 to 3.0 MeV<br>Neutron: thermal to 14 MeV |
| **Dose Equivalent Rate (DER) Range for $^{137}$Cs** | 1 to 4000 $\mu$R/h  (0.01 to 40 $\mu$Sv/h) |
| **Accuracy of DER** | $\pm$20% |
| **Neutron Measuring Range** | 1 to 100 cps |
| **Dosage Range** | 1 $\mu$R - 999 R (gamma only) |
| **Daily Background Reference** | Background level reference automatic on start-up, plus user-initiated as needed (Search Mode only) |
| **User Calibration** | None required.  Periodic functional test 1$\mu$Ci $^{137}$Cs. Factory calibration recommended every two years |

| ALARMS | |
|---|---|
| **Time to Alarm** | ≤2 seconds (gamma), ≤5 seconds (neutron) |
| **Alarm Alerts** | • Loud 85+ dB @ 30 cm for noisy environments<br>• Built-in vibration alarm<br>• Highly visible LED lights on both sides of LCD graphic display<br>• Can be separately enabled or disabled |
| **Alarm Settings** | **Search Mode**: Gamma and neutron alarm thresholds based on variations in local background level<br>**Safety Mode**: User-programmable low and high gamma alarm thresholds based on dose rate (applies to gamma alarm only) |

| DATALOGGING AND COMMUNICATION *Free Upgrade Available Summer 2006* | |
|---|---|
| **Datalog Size** | 30,000 data points (20 days at 60-second intervals) |
| **Datalog Modes** | **Continuous:** Logs data at all times<br>**Event-Driven:** Starts logging data on alarm |
| **Datalog Interval** | User programmable: 1 to 3,600 seconds |
| **Communication** | Built-in Bluetooth® radio interfaces with computer for datalog download |

| POWER | |
|---|---|
| **Battery** | 2 AA alkaline batteries easily accessible with a coin |
| **Operating Period** | Up to 600 hours |

| OPERATING ENVIRONMENT | |
|---|---|
| **Temperature** | -20° C to 50° C (-4° F to 122° F) |
| **Temperature Alarm** | Temperatures above 50° C (122° F) cause a high-temperature alert message |
| **Humidity** | 0% to 95% (non-condensing) |
| **Shock Resistance** | Passes drop test from 1.5 m (59") |
| **IP Rating** | IP67 |
| **Intrinsic Safety** | Certified to meet Class I, Div. I, Groups A, B, C, D, T4 |

| PHYSICAL CHARACTERISTICS | |
|---|---|
| **Display** | Graphic LCD display with 1.2" x 0.75" viewable area can be flipped for view by user;<br>Radiation intensity displayed in cps (gamma, neutron) or dosage rate in $\mu$R/hr or $\mu$Sv/hr (gamma only) |
| **Direct Readout** | Dosage rate, peak rate, minimum rate, total gamma dosage, battery status, current time and date, current time since start-up, internal temperature |
| **Ergonomics** | Nonslip rubber housing with grippable ridges securely fits hand or glove |
| **Key Pad** | 2 operation/program buttons |
| **Size** | 4.92" x 2.68" x 1.38" (125 x 68 x 35 mm) |
| **Weight** | 9.5 oz. (270g) |
| **Attachments** | Rugged metal belt clip and wrist strap |

\* Ongoing projects to enhance our products mean that these specifications are subject to change.

## Detector includes:
• Belt clip
• 2 AA alkaline batteries
• Wrist strap



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*NeutronRAE II*