



RadEye G/G-10

Wide Range Gamma Survey Meter
for Personal Radiation Protection



RadEye PRD/PRD-ER

High Sensitivity
Personal Radiation Detector



RadEye G20 variants

RadEye B20 variants

Multi-Purpose Survey Meters



RadEye N/NL

High Sensitivity Personal
Neutron Radiation Detector



RadEye AB100

Alpha Beta Contamination Monitor



RadEye Area Monitor

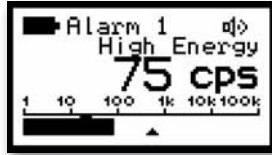
Gamma or Neutron Radiation Monitor



RadEye Accessories

RadEye - The Next Generation of Radiation Meters

Thermo Scientific introduces the next generation of advanced instruments for radiation detection, gamma dose rate measurements and area monitoring. The characteristic features of this versatile new pocket meter are the small size, the ease and flexibility of operation and its superior measurement performance which is provided by the use of sophisticated low power technology. Fully automated self-diagnostics minimize required maintenance.



All essential functions are easily accessed even while wearing protective gloves. The top-mounted alarm-LED can be seen while the instrument is worn in a belt-holster. A built-in vibrator and an earphone-output provide silent alarming or use in very noisy environment.



Menu Operation

All of the parameters can be easily modified on the RadEye or using the optional software. These menu operations can also be reconfigured to simplify the instrument and to avoid any faulty operation. Navigation is made easy by a clear and intuitive interface:

①: Opens the configuration menu. Once the menu is opened, features are selected by ① ② ③ ④



②: Additional information about e.g. the accumulated dose, remaining time in a certain radiation field as well as mean and maximum measuring values can be displayed.

③: On-switch and key lock - similar operation to your mobile phone.

④ ⑤: Operation of the audible indicator and alarm acknowledgement.



RadEye PRD Configuration



RadEye PRD History

Time	Dose Rate	Alarm	Event
2007-09-04 10:00	0.05	Off	Power On
2007-09-04 10:05	0.10	Off	Measurement
2007-09-04 10:10	0.15	Off	Measurement
2007-09-04 10:15	0.20	Off	Measurement
2007-09-04 10:20	0.25	Off	Measurement
2007-09-04 10:25	0.30	Off	Measurement
2007-09-04 10:30	0.35	Off	Measurement
2007-09-04 10:35	0.40	Off	Measurement
2007-09-04 10:40	0.45	Off	Measurement
2007-09-04 10:45	0.50	Off	Measurement
2007-09-04 10:50	0.55	Off	Measurement
2007-09-04 10:55	0.60	Off	Measurement
2007-09-04 11:00	0.65	Off	Measurement
2007-09-04 11:05	0.70	Off	Measurement
2007-09-04 11:10	0.75	Off	Measurement
2007-09-04 11:15	0.80	Off	Measurement
2007-09-04 11:20	0.85	Off	Measurement
2007-09-04 11:25	0.90	Off	Measurement
2007-09-04 11:30	0.95	Off	Measurement
2007-09-04 11:35	1.00	Off	Measurement
2007-09-04 11:40	1.05	Off	Measurement
2007-09-04 11:45	1.10	Off	Measurement
2007-09-04 11:50	1.15	Off	Measurement
2007-09-04 11:55	1.20	Off	Measurement
2007-09-04 12:00	1.25	Off	Measurement
2007-09-04 12:05	1.30	Off	Measurement
2007-09-04 12:10	1.35	Off	Measurement
2007-09-04 12:15	1.40	Off	Measurement
2007-09-04 12:20	1.45	Off	Measurement
2007-09-04 12:25	1.50	Off	Measurement
2007-09-04 12:30	1.55	Off	Measurement
2007-09-04 12:35	1.60	Off	Measurement
2007-09-04 12:40	1.65	Off	Measurement
2007-09-04 12:45	1.70	Off	Measurement
2007-09-04 12:50	1.75	Off	Measurement
2007-09-04 12:55	1.80	Off	Measurement
2007-09-04 13:00	1.85	Off	Measurement
2007-09-04 13:05	1.90	Off	Measurement
2007-09-04 13:10	1.95	Off	Measurement
2007-09-04 13:15	2.00	Off	Measurement
2007-09-04 13:20	2.05	Off	Measurement
2007-09-04 13:25	2.10	Off	Measurement
2007-09-04 13:30	2.15	Off	Measurement
2007-09-04 13:35	2.20	Off	Measurement
2007-09-04 13:40	2.25	Off	Measurement
2007-09-04 13:45	2.30	Off	Measurement
2007-09-04 13:50	2.35	Off	Measurement
2007-09-04 13:55	2.40	Off	Measurement
2007-09-04 14:00	2.45	Off	Measurement
2007-09-04 14:05	2.50	Off	Measurement
2007-09-04 14:10	2.55	Off	Measurement
2007-09-04 14:15	2.60	Off	Measurement
2007-09-04 14:20	2.65	Off	Measurement
2007-09-04 14:25	2.70	Off	Measurement
2007-09-04 14:30	2.75	Off	Measurement
2007-09-04 14:35	2.80	Off	Measurement
2007-09-04 14:40	2.85	Off	Measurement
2007-09-04 14:45	2.90	Off	Measurement
2007-09-04 14:50	2.95	Off	Measurement
2007-09-04 14:55	3.00	Off	Measurement
2007-09-04 15:00	3.05	Off	Measurement
2007-09-04 15:05	3.10	Off	Measurement
2007-09-04 15:10	3.15	Off	Measurement
2007-09-04 15:15	3.20	Off	Measurement
2007-09-04 15:20	3.25	Off	Measurement
2007-09-04 15:25	3.30	Off	Measurement
2007-09-04 15:30	3.35	Off	Measurement
2007-09-04 15:35	3.40	Off	Measurement
2007-09-04 15:40	3.45	Off	Measurement
2007-09-04 15:45	3.50	Off	Measurement
2007-09-04 15:50	3.55	Off	Measurement
2007-09-04 15:55	3.60	Off	Measurement
2007-09-04 16:00	3.65	Off	Measurement
2007-09-04 16:05	3.70	Off	Measurement
2007-09-04 16:10	3.75	Off	Measurement
2007-09-04 16:15	3.80	Off	Measurement
2007-09-04 16:20	3.85	Off	Measurement
2007-09-04 16:25	3.90	Off	Measurement
2007-09-04 16:30	3.95	Off	Measurement
2007-09-04 16:35	4.00	Off	Measurement
2007-09-04 16:40	4.05	Off	Measurement
2007-09-04 16:45	4.10	Off	Measurement
2007-09-04 16:50	4.15	Off	Measurement
2007-09-04 16:55	4.20	Off	Measurement
2007-09-04 17:00	4.25	Off	Measurement
2007-09-04 17:05	4.30	Off	Measurement
2007-09-04 17:10	4.35	Off	Measurement
2007-09-04 17:15	4.40	Off	Measurement
2007-09-04 17:20	4.45	Off	Measurement
2007-09-04 17:25	4.50	Off	Measurement
2007-09-04 17:30	4.55	Off	Measurement
2007-09-04 17:35	4.60	Off	Measurement
2007-09-04 17:40	4.65	Off	Measurement
2007-09-04 17:45	4.70	Off	Measurement
2007-09-04 17:50	4.75	Off	Measurement
2007-09-04 17:55	4.80	Off	Measurement
2007-09-04 18:00	4.85	Off	Measurement
2007-09-04 18:05	4.90	Off	Measurement
2007-09-04 18:10	4.95	Off	Measurement
2007-09-04 18:15	5.00	Off	Measurement
2007-09-04 18:20	5.05	Off	Measurement
2007-09-04 18:25	5.10	Off	Measurement
2007-09-04 18:30	5.15	Off	Measurement
2007-09-04 18:35	5.20	Off	Measurement
2007-09-04 18:40	5.25	Off	Measurement
2007-09-04 18:45	5.30	Off	Measurement
2007-09-04 18:50	5.35	Off	Measurement
2007-09-04 18:55	5.40	Off	Measurement
2007-09-04 19:00	5.45	Off	Measurement
2007-09-04 19:05	5.50	Off	Measurement
2007-09-04 19:10	5.55	Off	Measurement
2007-09-04 19:15	5.60	Off	Measurement
2007-09-04 19:20	5.65	Off	Measurement
2007-09-04 19:25	5.70	Off	Measurement
2007-09-04 19:30	5.75	Off	Measurement
2007-09-04 19:35	5.80	Off	Measurement
2007-09-04 19:40	5.85	Off	Measurement
2007-09-04 19:45	5.90	Off	Measurement
2007-09-04 19:50	5.95	Off	Measurement
2007-09-04 19:55	6.00	Off	Measurement
2007-09-04 20:00	6.05	Off	Measurement
2007-09-04 20:05	6.10	Off	Measurement
2007-09-04 20:10	6.15	Off	Measurement
2007-09-04 20:15	6.20	Off	Measurement
2007-09-04 20:20	6.25	Off	Measurement
2007-09-04 20:25	6.30	Off	Measurement
2007-09-04 20:30	6.35	Off	Measurement
2007-09-04 20:35	6.40	Off	Measurement
2007-09-04 20:40	6.45	Off	Measurement
2007-09-04 20:45	6.50	Off	Measurement
2007-09-04 20:50	6.55	Off	Measurement
2007-09-04 20:55	6.60	Off	Measurement
2007-09-04 21:00	6.65	Off	Measurement
2007-09-04 21:05	6.70	Off	Measurement
2007-09-04 21:10	6.75	Off	Measurement
2007-09-04 21:15	6.80	Off	Measurement
2007-09-04 21:20	6.85	Off	Measurement
2007-09-04 21:25	6.90	Off	Measurement
2007-09-04 21:30	6.95	Off	Measurement
2007-09-04 21:35	7.00	Off	Measurement
2007-09-04 21:40	7.05	Off	Measurement
2007-09-04 21:45	7.10	Off	Measurement
2007-09-04 21:50	7.15	Off	Measurement
2007-09-04 21:55	7.20	Off	Measurement
2007-09-04 22:00	7.25	Off	Measurement
2007-09-04 22:05	7.30	Off	Measurement
2007-09-04 22:10	7.35	Off	Measurement
2007-09-04 22:15	7.40	Off	Measurement
2007-09-04 22:20	7.45	Off	Measurement
2007-09-04 22:25	7.50	Off	Measurement
2007-09-04 22:30	7.55	Off	Measurement
2007-09-04 22:35	7.60	Off	Measurement
2007-09-04 22:40	7.65	Off	Measurement
2007-09-04 22:45	7.70	Off	Measurement
2007-09-04 22:50	7.75	Off	Measurement
2007-09-04 22:55	7.80	Off	Measurement
2007-09-04 23:00	7.85	Off	Measurement
2007-09-04 23:05	7.90	Off	Measurement
2007-09-04 23:10	7.95	Off	Measurement
2007-09-04 23:15	8.00	Off	Measurement
2007-09-04 23:20	8.05	Off	Measurement
2007-09-04 23:25	8.10	Off	Measurement
2007-09-04 23:30	8.15	Off	Measurement
2007-09-04 23:35	8.20	Off	Measurement
2007-09-04 23:40	8.25	Off	Measurement
2007-09-04 23:45	8.30	Off	Measurement
2007-09-04 23:50	8.35	Off	Measurement
2007-09-04 23:55	8.40	Off	Measurement
2007-09-04 24:00	8.45	Off	Measurement

RadEye PRD Logbook

RadEye Software

All settings and the data analysis can be done using the optional Windows™ based PC-software and an accompanying reader device. In order to allow post-event analysis, the latest 1600 dose rate values are stored in the data memory. For each data-logging interval both the mean and the maximum measurement values are stored.

Changes in configuration, along with alarms and errors, are saved in the RadEye memory. These events can be read out via the "logbook". It is shown as a table and can be saved to the PC or printed. The logbook has a maximum of 250 data sets. Several events that occur at the same time are saved as one record. On the display every event is shown in one line for a clear view.

RadEye Features

- **Large Graphic Display**
- **Simple and Intuitive User Interface**
- **Easily Configured for Specific Tasks**
- **Durable and Shock Resistant**
- **Accurate with Excellent EMI Immunity**
- **Low Power Technology**
- **Use of Rechargeable Standard-Size Batteries**

RadEye G / RadEye G-10 Excellence

RadEye	G	G-10
Exposure Dose Rate (R/h)	★★★★	
Ambient Dose Equivalent Rate (Sv/h)		★★★★
Wide Measuring Range	★★★★	★★★★
X-Ray Measurement	★★	★★
Gamma Source Detection	★	★



RadEye G: # 425067401



RadEye G-10: # 4250676
RadEye G-10 PTB: # 4250675

The RadEye G is a light-weight and very rugged instrument designed for quick and reliable measurement of gamma dose rates. Modern electronic circuitry guarantees excellent linearity over 6 decades of radiation intensity: from background level to 10 R/h - with overrange indication up to 1000 R/h. It incorporates a large energy compensated GM-tube for precise dose rate measurement for gamma and x-ray.

RadEye G-10 version incorporates a different energy filter in order to achieve a Sievert response curve according to ambient equivalent dose rate $H^*(10)$. There is also a PTB* type tested and approved version available.

The intelligent ratemeter algorithm (ADF mode) guarantees that even the smallest changes in dose rate are immediately detected, while at the same time, random fluctuations are effectively suppressed.

All essential functions are easily accessed while wearing protective gloves. The alarm-LED can be seen while the instrument is worn in a belt-holster. The instrument is also equipped with a built-in vibrator and an earphone-output for silent alarming or use in very noisy environment.

Large graphic display with clear prefix and bar-graph



Background measurement

Alarm thresholds - two triangles in the bargraph, indication low



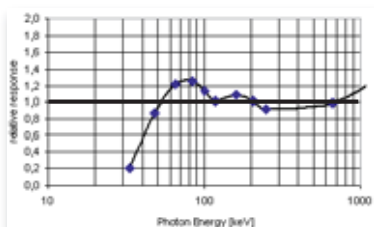
Approaching a source

Alarm thresholds - not yet exceeded
Trend arrow indicates increasing radiation level

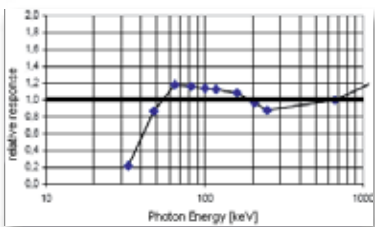


Alarm level 1 exceeded

"Alarm 1" and "speaker" signs show up
Absence of trend arrow indicates stable radiation level - reading can be taken



Energy response curve RadEye G
according to Roentgen units



Energy response curve RadEye G-10
according to ambient equivalent dose $H^*(10)$

Check Source

To keep the radiation detectors functionality of the RadEye G and RadEye G-10, Thermo Fisher Scientific offers an innovative test adapter based on 400 kBq Ba-133 - exempt quantity referring to e.g. NRC/IAEA/EU regulations. # 425067072

Main Applications	Gamma Dose Rate Measurement, X-Ray Measurement Security Forces, Nuclear Industry, First Responders, Medical Radiation Protection, Civil Defense
Detector	Energy compensated GM-tube
Measuring Range	RadEye G: 5 µR/h - 10 R/h RadEye G-10: 0.05 µSv/h - 100 mSv/h [5 µrem/h - 10 rem/h]
Overrange Indication	1,000 R/h [10 Sv/h]
Energy Range ± 30 %	RadEye G: 45 keV - 1.3 MeV RadEye G-10: 50 keV - 1.3 MeV
Count Rate for Cs-137 (662 keV)	17 cps per mR/h [1.7 cps per µSv/h]

*PTB: Physikalisch-Technische Bundesanstalt, Braunschweig, Germany

RadEye PRD Excellence

Gamma Source Detection	★★★★
Wide Measuring Range	★★
Gamma Dose Rate	★★
X-Ray Detection	★★
Neutron Source Detection	(★)


RadEye PRD: # 4250671

Factory calibrated in exposure rate R/h

RadEye PRD: # 425067120

Factory calibrated in H*(10) μ Sv/h

The so-called “orphan source” phenomena is a serious global problem as sources showing up unexpectedly in scrap yards, border crossings, or numerous other public locations are a significant potential threat. The RadEye PRD represents a high-performance measuring device for anyone responsible for finding radiation sources whether they be first preventers (border guards, customs agents, special forces or counter terrorism teams) or first responders (emergency services and law enforcement).

The RadEye PRD is 5000 - 100000 times more sensitive than a typical electronic dosimeter.

When looking for Nuclear Weapons, Improvised Nuclear Devices (IND's) or Radiological Dispersal Devices (RDD's or dirty bombs), it is of paramount importance that you have high sensitivity with high selectivity.

The RadEye PRD achieves this through a special technique based on our patented Natural Background Rejection (NBR) technology. It is the only instrument of its type and size to achieve this.

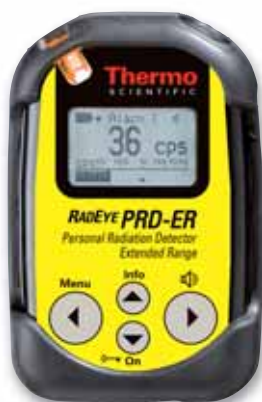
The RadEye PRD incorporates a high sensitivity NaI(Tl) scintillation detector with a miniature photo-multiplier allowing the detection of very low radiation levels with particular emphasis on gamma emissions below 400 keV.

- High quality PMT for excellent response from 30 keV
- EMI immunity much better than photodiode instruments
- NaI(Tl)-Detector for high response to SNM and RDD's
- True dose and dose rate calculation avoids significant overestimation of low gamma energies
- Automatic background update, i. e. no user action necessary
- NBR allows very low alarm levels for artificial radioactivity
- Designed to meet ANSI 42.33/1, 42.32 and IEC 62401
- Energy response behavior in Roentgen or Sievert can be selected via software

Main Application	High Sensitivity Gamma Radiation Detection and Dose Rate Measurement Security Forces, Steel and Recycling Industry, First Responders
Detector	NaI(Tl)-detector with high quality μ -Photomultiplier; software switch for R or Sv energy response and calibration
Measuring Range	1 μ R/h – 25 mR/h [0.01 μ Sv/h – 250 μ Sv/h]
Overrange Indication	1,000 R/h (10 Sv/h)
Energy Range (+/- 30 %)	60 keV – 1.3 MeV, excellent detection from 30 keV
Response for Cs-137 (662 keV)	1.5 cps per μ R/h [150 cps per μ Sv/h]
Response for Am-241 (60 keV)	30 cps per μ R/h [2000 cps per μ Sv/h]
Linearity error (Cs-137)	max. \pm 10 %
Enhanced alarming sensitivity by Natural Background Rejection	Yes, down to 1 μ R/h [0.01 μ Sv/h] at low gamma energies
Cosmic Radiation Background	Suppression typically > 95 %

RadEye RadEye PRD-ER Excellence

Gamma Source Detection	★★★★
Wide Measuring Range	★★★★
Gamma Dose Rate	★★
X-Ray Detection	★★
Neutron Source Detection	(★)



RadEye PRD-ER: # 425067102

Factory calibrated in exposure rate R/h

RadEye PRD-ER: # 425067122

Factory calibrated in H*(10) μ Sv/h

RadEye PRD-ER

Special proprietary circuitry allows the energy compensated dose and dose rate measurement up to 100 mSv/h (or 10 rem/h). Thus the RadEye PRD-ER is the ideal tool for both interdiction and response.

Unlike instruments using 2 different detectors for the low dose rate range and the high dose rate range, the single detector arrangement in the RadEye PRD-ER offers the following unique advantages over the whole measuring range:

- Consistent angular dependence
- No mutual shielding of neighboured detectors
- Consistent energy response
- No transition range with annoying hysteresis effects
- No high activity source for function test of high dose rate detector required

With the help of the RadEye PRD-ER test adapter user can check the full detector performance on a regular basis – without the need of a high dose rate calibration facility.

Lutetium Test Adapter for PRD and PRD-ER

To “challenge” the radiation detector’s functionality of the RadEye PRD and RadEye PRD-ER, Thermo Fisher Scientific has developed an innovative test adapter based on high purity natural Lutetium-Oxide.



Test adapter kit for RadEye PRD, RadEye PRD-ER, including carrying case and HV-adjustment software.



Gamma test adapter containing 36 g Lu_2O_3 for RadEye PRD and RadEye PRD-ER.
Net count rate approximately 100 cps.
425067071

The design of a special shape enclosure and the use of high density Lu_2O_3 ceramics minimizes the required activity for the RadEye PRD and RadEye PRD-ER.

For additional information please see page 16!

Technical data of RadEye PRD-ER (deviating from RadEye PRD specifications)

Measuring Range	1 μ rem/h - 10 rem/h (0.01 μ Sv/h – 100 mSv/h)
Overrange Indication	10,000 rem/h (100 Sv/h)
Linearity error (Cs-137)	max. \pm 20 %

RadEye B20 / RadEye B20-ER Excellence

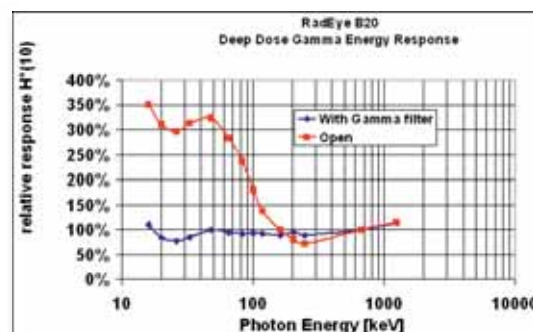
RadEye	B20	B20-ER
Gamma Dose Rate (with filter)	★★★★	★★★★
Beta Contamination	★★★★	★★★★
X-Ray Measurement	★★★★	★★★★
Wide Range	★★	★★★★
Beta Dose rate	★★	★★
Alpha Contamination	★	★



RadEye B20: # 4250685

RadEye B20-ER: # 425068510

The RadEye B20 is a modern compact multi-purpose contamination meter for alpha, beta, gamma and X-ray radiation. By virtue of optional gamma energy filters, deep or shallow dose rate measurements from 17 – 1300 keV can be performed. For emergency response purposes alpha and beta contamination can be discriminated using another optional filter. The instrument is part of the growing RadEye family of high-end stand-alone meters, which are designed to exceed the most demanding user expectations.



Features of RadEye B20

- Light Weight (300 g), excellent grip with and without gloves
- Rugged and compact design, thick rubber protective cover
- Low cost of ownership with > 500 h operation time with 2 AAA batteries – rechargeable NiMH-cells can be used
- Menu-driven user interface results in low training cost and immediate familiarity
- Huge internal data memory for both scaler results and continuous data recording
- Bright backlit LCD display – plain text messages - different languages can be selected
- Easy adaptation to different tasks by supervisorcon: figuration, calibration, selection of measuring units
- Versatile operation modes:
 - Scaler / Timer with preset count and preset time for sample measurements
 - Continuous ratemeter mode for frisker operation
 - Dose rate mode
- Audible indication: single pulse or chirper mode proportional to count rate
- Earphone output for operation in loud environment
- A table of up to 15 nuclides can be loaded for display in Bq or dpm

Main Applications	Civil Defence, Fire Brigades, Hospitals, Nuclear Industry, Pharmaceutical Industry
Detector	1 pancake GM-tube, window, dia. 44 mm (1.7"), 1.8 – 2.0 mg/cm ²
Measuring Range (gamma dose rate) Uncompensated or with opt. energy filter	0 - 2 mSv/h [0 - 200 mrem/h] RadEye B20 0 - 100 mSv/h [0 - 10 rem/h] RadEye B20-ER
Measuring Range (contamination)	0 - 10 kcps RadEye B20 0 - 500 kcps RadEye B20-ER
2 π Efficiency (ref. to 50 mm diameter without rubber sleeve)	Am-241: 28%; Co-60: 25%; Sr/Y-90: 36%; C-14: 19 %
Energy Range (with gamma energy filter)	17 keV – 1.3 MeV according to H*(10) or H'(0.7)
Weight and maximum dimensions	300 g (0.7 lb); 13 cm x 7 cm x 6 cm (5.2" x 2.8" x 2.4")
Alarm indication	LED, sound, vibrator

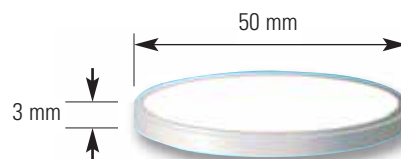
Accessories B20

Beta/gamma test adapter for RadEye B20 and B20-ER (9 g Lu_2O_3):

425068571

Typical net count rate for RadEye B20: 6 cps

For additional information please see page 16!



Energy Filters

- Removable energy filter for directional dose equivalent $H'(0.07)$ (shallow dose) from 20 keV. # 425068583
- Removable energy filter for ambient dose equivalent $H^*(10)$ (deep dose) in Sv/h or rem/h from 17 keV. # 425068582
- Removable alpha-rejection filter for quick estimation of alpha contamination in emergency response situations. # 425068581



First Responder Labotary Kit

Without RadEye: # 425069011



42506901001



Pelican Case containing:

- Sample changer for use with the RadEye B20
- Sample planchets with different lip heights
- Disposable gloves, spatula
- 50 mm filters

Space for:

- RadEye B20
- Data cable
- User manual
- Lutetium-Oxide test adapter
- Additional RadEye (PRD or N)

RadEye - Technical Characteristics

	PRD	PRD-ER	G	G-10	G20	G20-ER
Detector	Nal(Tl)	Nal(Tl)	GM	GM	Pancake GM	Pancake GM
Gamma & X-rays (detection)	> 30 keV ★★	> 30 keV ★★				
Gamma & X-rays (dose rate)	> 60 keV ★	> 60 keV ★	> 45 keV ★★	> 48 keV ★★	> 40 keV ★★★★	> 40 keV ★★★★
Beta dose rate						
Beta contamination						
Alpha contamination						
Alpha/Beta discrimination						
Neutron source detection	Via gamma (★)	Via gamma (★)				
Neutron source verification						
Measuring units – dose rates are energy compensated	cps Sv/h rem/h R/h	cps Sv/h rem/h R/h	R/h	Sv/h rem/h	R/h	R/h
Upper dose rate limit	250 µSv/h 25 mR/h 25 mrem/h ★	100 mSv/h 10 rem/h ★★★★	10 R/h ★★★★	100 mSv/h 10 rem/h ★★★★	200 mR/h ★★	10 R/h ★★★★
cps at 1 µSv/h (100 µrem/h), 662 keV	150 ★★★★	150 ★★★★	1.7 ★	1.7 ★	4 ★★	4 ★★
Holster, Area monitor	X	X	X	X		
Car adapter	X	X	X	X	X	X
Testadapter	36 g Lu ₂ O ₃	36 g Lu ₂ O ₃	400 kBq Ba-133	400 kBq Ba-133	50 g Lu ₂ O ₃ 400 kBq Ba-133	

G20-10	G20-ER10	B20	B20-ER	N	NL	AB100
Pancake GM	Pancake GM	Pancake GM	Pancake GM	10 bar He-3 (IATA: UN 3363)	2.5 bar He-3	Dual phosphor scintillator
		> 5keV ★★★★	> 5 keV ★★★★			
> 17 keV ★★★★	> 17 keV ★★★★	> 17 keV with filter ★★★★	> 17 keV with filter ★★★★			
		★★★★	★★★★			
		★★★★	★★★★			★★★★
		★★★★	★★★★			★★★★
		with filter (★)	with filter (★)			★★★★
				★★★★	★★	
				★★★★	★★★★	
Sv/h rem/h	Sv/h rem/h	cps, cpm Bq, dpm, dps Sv/h, rem/h	ps, cpm Bq, dpm, dps Sv/h, rem/h	cps	cps	cps, cpm Bq, dpm, dps
2 mSv/h 200 mrem/h ★★	100 mSv/h 10 rem/h ★★★★	2 mSv/h 200 mrem/h ★★	100 mSv/h 10 rem/h ★★★★			
4 ★★	4 ★★	4 ★★	4 ★★			
				X	X	
X	X	X	X	X	X	
50 g Lu ₂ O ₃ 400 kBq Ba-133		9 g Lu ₂ O ₃	9 g Lu ₂ O ₃			9 g Lu ₂ O ₃

RadEye G20 variants Excellence

RadEye	G20	G20-ER	G20-10	G20-ER10
Exposure Dose Rate (R/h)	★★★★	★★★★		
Ambient Dose Equivalent Rate (Sv/h)			★★★★	★★★★
X-Ray	★★★★	★★★★	★★★★	★★★★
Wide Range	★★	★★★★	★★	★★★★



RadEye G20: # 4250686

RadEye G20-ER: # 425068610

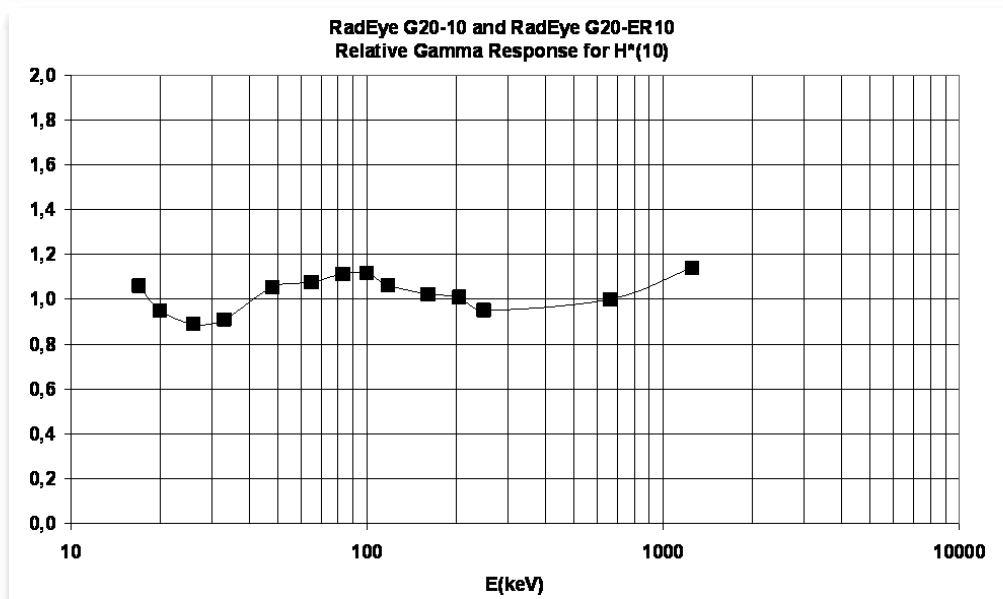
RadEye G20-10: # 4250687

RadEye G20-ER10: # 425068710

The RadEye G20-10 and G20-ER 10 are excellent gamma survey meters with a flat energy response curve from 17 keV to 1.3 MeV according to ambient equivalent dose $H^*(10)$. The versions G20 and G20-ER are equipped with a different energy filter in order to yield an energy response for dose rate measurements in R/h.

Features of RadEye G20/G20-ER and G20-10/G20-ER10

- Light Weight (300 g), excellent grip with and without gloves
- Rugged and compact design, thick rubber protective cover
- Low cost of ownership with > 500 h operation time with 2 AAA batteries – rechargeable NiMH-cells can be used
- Menu-driven user interface results in low training cost and immediate familiarity
- Huge internal data memory for both scaler results and continuous data recording
- Bright backlit LCD display – plain text messages - different languages can be selected
- Audible indication: single pulse or chirper mode proportional to count rate
- Earphone output for operation in loud environment



Gamma test adapter for RadEye G20/G20-ER and portable scintillation detectors (50 g Lu_2O_3): # 4254948

62 mm diameter, 7 mm height (aluminium housing)

55 mm diameter, 3 mm height (Lu_2O_3 ceramics)

Induced net dose rate for RadEye G20: 0.25 $\mu\text{Sv/h}$ (25 $\mu\text{rem/h}$).

Time requirement for response verification approx. 5 min.

For immediate response verification a 400 kBq Ba-133 (exempt quantity) or other gamma test sources can be used.



For additional information please see page 16!

RadEye N / RadEye NL Excellence

Neutron Radiation Detection	★★★★
Neutron Source Verification	★★★★
Neutron Source Detection	★★★
Neutron Dose Rate	(★)

The new RadEye N closes a gap in the classical product spectrum of the radiation measurement technology.

Rem-Counters for neutron detection with a He-3 or BF₃ tube are usually heavy and bulky since fast neutrons have to be moderated in order to be detected and to provide the correct neutron dose rate response.

Low energy neutrons with their lower biological impact however have to be suppressed to a large extent. Thus the rather low sensitivity of Rem-Counters to pre-moderated neutrons can be explained.

Dropping the demand for energy compensated dose rate response, a device can be built with one fiftieth of the weight and comparable or even a higher neutron response as compared to a Rem-Counter.



RadEye Area Monitor for neutron radiation



RadEye N: # 4250677



RadEye NL: # 4250678

RadEye NL

Users (e.g. service staff) who travel on commercial aircraft should use the RadEye NL, with a He-3 pressure of 2.5 bar. In this case both the neutron sensitivity and the background effect is only half as much as of the RadEye N.



RadEye can be worn in a holster

High sensitivity for neutron radiation

- Rapid warning of neutron radiation fields
- Applicable as an Area Monitor
- Exceeds the neutron response requirements of ISO 22188
- Ideal complement to passive and active neutron dosimeters

160g lightweight with low power technology

- Always ready for use - can be worn and operated in its holster
- Hands-free operation with no restriction of personal mobility
- Rapid scanning of changing field intensities
- Detection of neutron shielding deficiencies and source presence
- Ideal complement to Rem-Counters

No spill-over from gamma radiation up to 10 mSv/h (1 R/h)

- Ideal for verification of neutron fields when dealing with unknown radiation sources
- No false "Neutron Alarm"
- Can be used in high gamma dose rate fields

Main Applications	Users of industrial neutron sources, e.g. in geology and material testing Operators and users of accelerators in medical science and research Radiation protection staff and inspectors of nuclear facilities First Responders and law enforced officers
Detector	He-3 tube with 10 bar filling pressure (RadEye N) He-3 tube with 2.5 bar filling pressure (RadEye NL)
Sensitivity when worn at the body (RadEye N)	approx. 0.3 cps per $\mu\text{Sv/h}$ (3 cps per mrem/h) for Cf-252, detects 0.01 μg Cf-252 in typically 2 - 3 s for 25 cm (10") distance
Background	approx 0.005 cps at 300 m above sea level (RadEye N)
Gamma spill-over	< 0.2 cps at 10 mSv/h (1 R/h) Cs-137 radiation
Measuring units	Count rate (cps) moving average over 10 s Mean value and peak value over any time period
Operation time (2 AAA alkaline batteries)	400 h (RadEye N) 500 h (RadEye NL)

RadEye AB 100 Excellence

Beta Contamination	★★★
Alpha Contamination	★★★
Gamma Source Detection	★



RadEye AB100: # 4250683

The RadEye AB100 is a modern contamination meter for surface contamination measurements with excellent alpha/beta discrimination. The user can select the proper calibration factor within a list of isotopes (e.g. Bq, Bq/cm², dpm).

The instrument is part of the growing RadEye family of high-end stand-alone meters, which are designed to meet the most demanding user expectations.



Simultaneous measurement of alpha-, beta-, and gamma radiation



Alpha alarm is indicated



Scaler Mode

Features of RadEye AB100

- Light Weight (900 g), excellent grip with or without gloves
- Rugged and compact design
- Low cost of ownership with > 1,000 h operation time using 2 C batteries – rechargeable NiMH-cells can be used
- Menu-driven user interface resulting in low training cost and immediate familiarity
- Huge internal data memory for both scaler type and continuous data recording
- Bright backlit LCD display – plain text messages - different languages can be selected
- Easy adaptation to different tasks by supervisor configuration, calibration, selection of measuring units
- Versatile operation modes:
 - Scaler / Timer with preset count and preset time for sample measurements
 - Continuous ratemeter mode for frisker operation
 - Alpha, Beta and Alpha + Beta modes
 - Gross or net counting
- Audible indication: single pulse for alpha, chirper mode for beta - proportional to count rate
- Earphone output for operation in a loud environment
- One hot and four advanced buttons - easy to use, no PC required

Main Applications	Civil Defence, Fire Brigades, Hospitals, Nuclear Industry, Pharmaceutical Industry	
Efficiency (per surface emission)	Am-241:	36 % (α)
	Co-60 :	23 % (β)
	Sr/Y-90:	49 % (β)
Gamma response (Cs-137)	approx. 40 s ⁻¹ /(μSv/h)	0.4 s ⁻¹ /(μR/h)
Window thickness/Active area	Thickness: 0.87 mg/cm ² aluminized plastic film	
	Sensitive area of 69 x 145 mm [2.71" x 5.71"]; Open area of approx. 85 %	
Dimensions / Weight	355 mm x 100 mm x 180 mm [14" x 4" x 7.1"] / approx. 0.9 kg [2 lb]	

RadEye Area Monitor Excellence

The Area Monitor is a RadEye application suitable for several different RadEye types. The following applications are possible:

- Gamma dose rate measurement (RadEye G),
- Highly sensitive alarm indication for radioactive gamma sources (RadEye PRD)
- Detection of neutron sources (RadEye N)

The wall mounted RadEye Area Monitor extends the application range to convenient and cost-effective gamma and neutron area monitoring. In case of exceeding a preset threshold the system sets off an audible/optical alarm and the RadEye can be immediately used as a portable instrument.

- Area Monitor and flexible handheld instrument in one
- No additional handheld instrument for locating the source is necessary
- In case of power failure the RadEye is still operational due to rechargeable batteries and built-in battery charger
- Simultaneous gamma and neutron monitoring with two RadEye Area Monitors



RadEye Area Monitor: # 4250680



1. Alarm Indication

Acoustical and optical alarm is indicated by the RadEye Area Monitor and the optional external alarm indicator.

Horn and bright flash light can be acknowledged even if radiation level is still elevated.

2. No need for an additional portable instrument!

Authorized staff takes the RadEye out of the box.



3. Finding the radiation source



4. Re-insertion of the RadEye

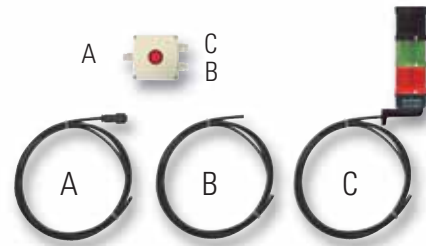
The green light of the external indicator turns on once the RadEye is reinstalled in the box. Now the Area Monitor is ready for action again.

The wall mounted Area Monitor can be complemented with an external alarm unit with horn and beacon signalling and can be remotely acknowledged. The alarm unit can be placed up to a distance of 10 m (other lengths upon request) from the Area Monitor via cable.



4250680

RadEye Area Monitor: Enclosure w/ transparent door; car adapter; AC/DC adapter w/ 2m cable & connector; red light on enclosure; RS 232 interface 9 pin D-SUB connector (watertight); connector for ext. alarm unit.



425068010

Additional external alarm unit consisting of:
5 m cable with connector fitting to connector at 4250680; small box with latching relay and acknowledgement button;
5 m cable between box and strobe + horn with wall mount holder.

In conjunction with the special battery lid and 2 standard NiMH AAA-cells, the inductive RadEye charger allows permanent operation of any RadEye version (except RadEye AB 100).

The RadEye remains galvanically isolated from the external DC-supply.



Inductive RadEye charger
425067080



Special battery lid
425067034

In case an alarm-relay output from the RadEye and/or simultaneous serial data communication is required, the car adapter 425067065 or the area monitor 425067080 is required.

RadEye Accessories

- | | | | | | |
|---|---|--|---|---|--|
| <p>A
B
C</p> |  | <p>Earphone for RadEye series
425067037</p> | <p>A
B
C</p> | <p>User Software
"RadEye.Exe"
+
Calibration Software
"Cal-RadEye.Exe"</p> | <p>RadEye Software
425069951
+
425069952</p> |
| <p>A
B</p> |  | <p>Holster for RadEye units. Sized to insert instrument with rubber shock protection
425067046</p> | <p>A
B</p> |  | <p>Transparent plastic holster with safety-lanyard
425067044
(without RadEye)</p> |
| <p>A
B</p> |  | <p>1 Desktop holder for RadEye for use with data cables 4254026 or 4254029
425067060</p> | <p>A
B</p> |  | <p>2 Docking station ("car adapter") with charging circuitry (8-30 V DC, cigarette lighter plug), alarm relay and RS 232 interface.
425067065</p> |
| <p>2
4</p> |  | <p>3 RS 232 to USB adapter for data cable 4254029, docking station 425067065, area monitor 425067080
SM168535251</p> | <p>1
C</p> |  | <p>4 Data cable RS 232 for RadEye desktop holder
4254029</p> |
| <p>1
2</p> |  | <p>1 2 Goose neck mounting kit for attachment to the windshield; fits to docking station 425067065 or desktop holder 425067060
425067064</p> | <p>1
2</p> |  | <p>1 2 Knuckle joint screw-mounting kit; fits to docking station 425067065 or desktop holder 425067060
425067063</p> |
| <p>1
2</p> |  | <p>1 2 Flat mounting kit, incl. plates for screw- and adhesive mounting; fits to docking station 425067065 or desktop holder 425067060
425067059</p> | <p>1
2</p> |  | <p>1 2 Pivot arm screw-mounting kit; fits to docking station 425067065 or desktop holder 425067060
425067062</p> |
| <p>1
2</p> |  | <p>1 2 Goose neck screw-mounting kit; fits to docking station 425067065 or desktop holder 425067060
425067061</p> | <p>2
3
4</p> |  | <p>2 3 4 RS 232 adapter cable, 9-pin, 5 m, fits to docking station 425067065 and Area Monitor 425067080
SM168535223</p> |
| <p>2</p> |  | <p>2 AC/DC converter for AC supply of docking station 425067065 (1000 - 240 V AC, 24 V DC, 600 mA) with US, UK, EU connector
425067066</p> | <p>1
C</p> |  | <p>1 C USB data cable for desktop holder
4254026</p> |

How to read this overview

1) RadEye versions classification

The accessory shown is suitable for use with:

- A** RadEye PRD/PRD-ER, RadEye G/G-10, RadEye N/NL
- B** RadEye G20/G20-ER, RadEye B20/B20-ER
- C** RadEye AB100

2) Combinations of accessories

The accessories marked with **1 2 3 4** on the left side of the product image are a necessary and/or reasonable combination with products including the same number **1 2 3 4** inside the image.

RadEye Accessories - Telescopic Adapter A B

- 1 RadEye adapter with connector to the handle or extensions: # **425067078** (without RadEyes)
- 2 Short handle, length 0.35 m: # **425067075** (without RadEye)
- 3 Aluminium extension, length 1.2 m: # **425067076** (without RadEye)
- 4 Telescopic extension up to 4.0 m: # **425067077** (without RadEye)



Advantages and additional information regarding Test Adapters based on Lu_2O_3

Thermo Fisher Scientific has developed an innovative series of Test Adapters based on high purity natural Lutetium-Oxide (containing the isotope Lu-176 with a 28 times greater half-life than K-40) to provide all users with the capability to “challenge” their radiations detectors functionality. These adapters can be used for performance verification of highly sensitive gamma detectors and pancake type beta contamination probes. Unlike other materials and objects containing natural radioactivity - such as old watches or incandescent lantern mantles - these test adapters have an activity that is well-defined and reproducible. Due to their natural origin and low specific activity, under US DOT or IATA rules for dangerous goods shipments these adapters are not considered as radioactive material.

X-ray and Gamma lines:*

Energy	8 keV	54 keV	55 keV	63 keV	88 keV	202 keV	307 keV	401 keV
Emission	23 %	9.4 %	16.5 %	6.9 %	13 %	84 %	93 %	0.8 %

Beta max. energy:*

Energy	188 keV	589 keV
Emission	0.9 %	99.1 %

The actual beta spectrum is broadened and shifted to lower energies due to energy loss in the bulk material.

* Nuclides 2000: An Electronic Chart of the Nuclides, Version 1.00 European Communities, 1999.

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