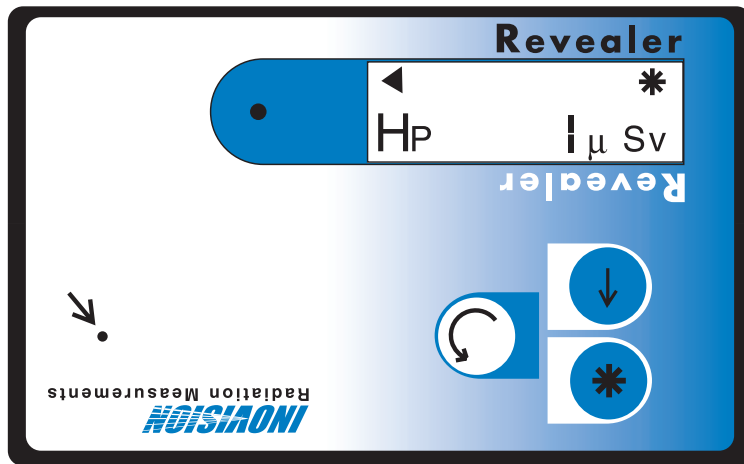


Revealer® Solid State Personal Alarming Dosimeter

Inovision Model 41277



- Audio & visual alarms
- Stores 5-year personal dose history
- Credit card size and lightweight
- Uses standard watch battery
- Rugged, shock-proof, and decontaminable
- PC enabled database management
- Windows® based software

Introduction

The Model 41277 Revealer is a personal dosimetry card that measures dose and dose rate in real time with audible and visual alarms that alerts the user immediately that a preset radiation level has been surpassed. With its credit card size and only three buttons needed to operate the device, the Revealer is the smallest and easiest to use electronic dosimeter available.

Applications

The Revealer and software track occupational doses for workers and visitors exposed to radiation in nuclear medicine, brachytherapy, radiation therapy, PET facilities, nuclear research facilities, airline flight crews, and HAZMAT teams where there is a need for an alarm level below 10 $\mu\text{Sv/hr}$ and energies above 50 keV are of concern.

The Revealer is a personal dosimeter that is the cornerstone of a complete dosimetry system. With the badge reader and Windows based database management system, an entire department's detailed dose history can be stored and managed.

The Revealer dose history records are downloaded to a personal computer via the Revealer Dosimeter Reader with user-friendly Windows based software. Dose Manager Software allows transfer of the user's personal data from the dosimeter memory. Retrieval of the stored data and detailed dose history are easily managed.

Features

- Electronic dosimeter with LCD display and large nonvolatile memory
- Measures dose equivalent $\text{Hp}(10)$ according to International Commission on Radiation Units (ICRU) 39
- Measures dose from 1 μSv to 10 Sv; dose rate from 1 $\mu\text{Sv/hr}$ to 1 Sv/hr
- Stores daily, monthly, quarterly, yearly, and 5-year cumulative doses
- 3400 hour operation typical on single battery
- Dosimeter includes protective vinyl pocket and pocket clip
- Badge reader and database management software available
- Available in rem units

Specifications

Detector Energy compensated silicon diode detector (an arrow indicates the detector location)

Radiation detected Gamma and x-ray from 50 keV to 2 MeV

Overall accuracy $\pm 15\%$ from 60 keV to 1.25 MeV;
 $\pm 30\%$ from 50 keV to 2 MeV

Sensitivity 0.03 CPS per $\mu\text{Sv/h}$, or 130 counts/mSv

Range

Dose 1 μSv to 10 Sv

Dose rate 1 $\mu\text{Sv/h}$ to 1 Sv/h

Alarms 70 dB buzzer with specific sound according to alarm type (dose or dose rate)

Flashing red LED (1 flash per second)

Flashing pictogram alarm, display of the threshold exceeded and the peak rate

Adjustable alarm thresholds Current dose, day/month/quarter doses from 10 μSv to 10 Sv; Dose rate from 10 $\mu\text{Sv/hr}$ to 1 Sv/hr

Data storage Complete identification of badge wearer and dosimeter

Last 100 doses Measurements in presetable time intervals, daily doses over the last 3 months, monthly doses over the last 5 years

Cumulative doses for the day, the last 30 days, the last 90 days, the last 12 months, the last 60 months, the working life time

Dates and values of the last 6 measurements exceeding alarm thresholds

Battery Standard lithium battery CR2450 (3 V, 540 mAh)

Battery life 3400 hours, 5 months in continuous operation, 1 year for 8 hr daily operation

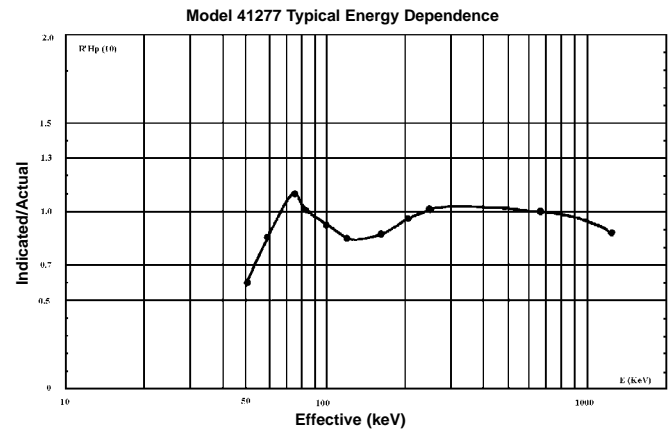
Battery backup Complete chronological data: doses, overflows, wearer identification and badge identification, for 10 years without battery, in an EEPROM memory

Typical energy dependence

Irradiation on PMMA phantom

Range of Cesium 137

$R[\text{Hp}(10)] = 1.04 \text{ "uSv"/uSv}$



Dimensions 3.5 (w) x 0.3 (d) x 2.2 in (h) (8.9 x 0.8 x 57 cm)

Weight 0.11 lb (0.05 kg)

Optional accessories

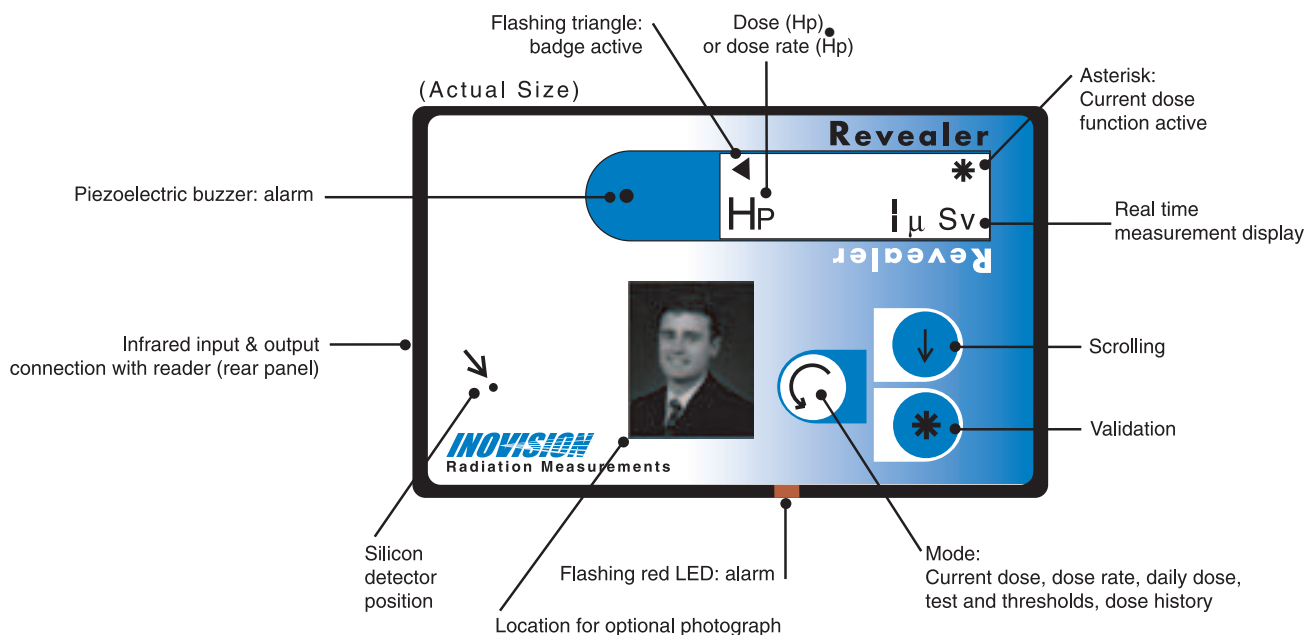
Revealer Dosimeter Reader Kit (Model 41278), consists of reader, AC adapter, and Dose Manager software

Available model(s)

41277 Revealer Solid State Personal Alarming Dosimeter, includes a protective cover, pocket clip, battery, and instruction manual

For additional information, please contact Cardinal Health, Radiation Management Services customer service at 440.248.9300, 800.850.4608, or fax: 440.349.2307; located at 6045 Cochran Road, Cleveland, Ohio 44139-3303, USA.

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Beeper mR Radiation Monitor

Model 05-106

Introduction

The slim, compact Beeper mR is the ideal personal monitoring device for alerting personnel to the presence of radiation in medical, industrial or research settings. It accurately measures and displays the radiation dose received.

Applications

The only control is a switch to turnoff and reset the instrument, making Beeper mR extremely easy to use. For added safety, the switch is recessed. An easy-to-read LCD display provides a continuous indication of accumulated dose. The loud "bleep" sounds every 15 to 30 minutes on background and becomes more frequent as dose rate increases, becoming a continuous sound in high radiation fields. A series of quiet "clicks" indicates it is properly functioning. Beeper mR is an enhanced version of the highly popular Beeper III and utilizes the same proven technology.

Specifications

Bleep rates for background radiation

Approx. 1 bleep every 15 to 30 minutes.
1 mR/h: approx. 1 bleep every 20 seconds.
100 mR/h and above: continuous signal to at least 60 Sv/h (6000 R/h)

Energy range 45 keV to 6 MeV ($\pm 25\%$)



Doserate response Linear to 5 R/h ($\pm 20\%$)

Display LCD 0.1 mR to 999,999.9 mR

Battery Three alkaline batteries, size AAA. Typical battery life is 1 year

Temperature range - 4° to + 122°F (- 20° to + 50°C)



Radiation Safety

- Continuously monitors radiation exposure and provides instant, accurate readings
- Measures "x" and gamma radiation
- Display can be easily read with the instrument in-pocket
- Sturdy casing with pocket clip protects against damage
- Features visible and audible "battery low" indicators
- Good energy and polar response...reliable readings match those from TLDs and film badges
- Recessed switch ensures the Beeper mR cannot be turned off accidentally

Dimensions 1.4 (w) x 6 in (d) (3.56 x 15.24 cm)

Display area 0.6 x 0.9 in (1.52 x 2.29 cm)

Weight 0.25 lb (0.11 kg)

Available model(s)

05-106 Beeper mR Radiation Monitor

05-106-2200 Beeper μ Sv Radiation Monitor

Beeper III Personal Radiation Monitor

Models 05-104

- Provides a continuous indication of gamma or x-ray dose rate
- Pocket-size... lightweight

Here is a simple, convenient instrument for alerting personnel to the presence of ionizing radiation. It provides a clear, audible indication of gamma and x-ray dose rates. No controls or adjustments are required.

The instrument operates continuously, giving a bleep every 15 minutes for normal background radiation, increasing with the dose rate to a continuous tone when high radiation doses are present. This compact unit slips easily into the pocket, where it is firmly held by a clip.

Specifications

Sensitivity to background radiation

Approx. 1 bleep per 15 minutes. 1 mR/hr: approx. 1 bleep per 20 seconds. 100 mR/hr and up: continuous signal (to at least 6000 R/hr)

Energy range 30 keV to 10 MeV

Temperature range - 4° to 122°F (- 20° to + 50°C)

Batteries Two alkaline AAA. Battery life approx. 1 year

Construction Plastic case with clip

Dimensions 1 (w) x 5.5 (d) x 0.63 in (t) (2.54 x 13.97 x 1.60 cm)

Weight 0.17 lb (0.08 kg)



Available model(s)

05-104 Beeper III Personal Radiation Monitor

For additional information, please contact Cardinal Health, Radiation Management Services customer service at 440.248.9300, 800.850.4608, or fax: 440.349.2307; located at 6045 Cochran Road, Cleveland, Ohio 44139-3303, USA.

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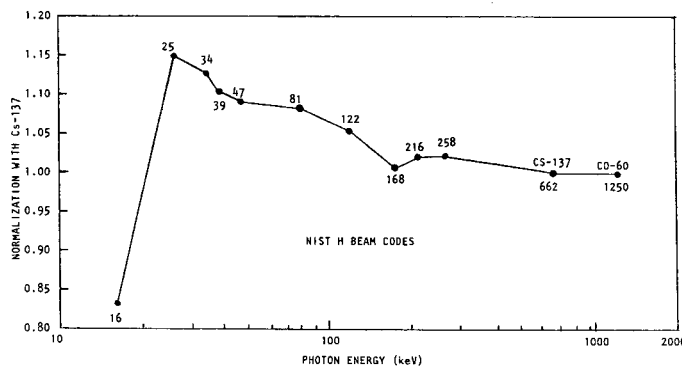
Direct Reading Pocket Dosimeters

Models 06-007 to 06-686

- Low leakage: measures background
- Superior energy response: 20 keV to 2 MeV
- Rugged: meets ANSI specifications N13.5 and N322
- Highly resistant to shock and vibration
- Available in a wide selection of ranges to meet all of your requirements

Introduction

Direct-Reading Pocket Dosimeters are rugged, precision instruments designed specifically for measuring accumulated quantities of gamma and x radiation. In use, the dosimeter is normally clipped to a pocket or to the outside of a lead apron. By checking the dosimeter reading periodically, the wearer is able to determine the exposure received during specific procedures. By knowing where and when greater-than-normal exposures occur, the wearer can identify the source and take quick, corrective action. We currently offers five dosimeters. Each dosimeter has a color-coded clip that signifies its range. This will help the user to identify the dosimeter (i.e. black clip = 0 to 200 mR, blue clip = 0 to 5 R, etc.), and ensure that the intended dosimeter is utilized.



Model 06-007

Applications

Direct-Reading Pocket Dosimeters are extremely easy-to-use. To read the integrated exposure, the user looks through the dosimeter eyepiece while pointing the unit toward any external light source. The exposure is determined by the position of a hairline fiber against a graduated scale. A Dosimeter Charger (Model 06-912) is used to re-zero the dosimeter.

The 0 to 200 mR Low-Energy Dosimeter is the most popular type for measuring personal radiation doses in hospital applications including fluoroscopy, portable radiography and angiography. Our dosimeters are ideal for nuclear medicine and health physics applications. All Direct-Reading Pocket Dosimeters are hermetically-sealed using state-of-the-art plastics and epoxy resins. These reliable, high-quality devices meet ANSI specifications N13.5 and N322, as well as military requirements.

Specifications

Radiation detected Gamma and x-radiation from 20 keV to 2 MeV

Ranges 0-200 mR to 600 R

Energy response See response curve:

160 keV to 2 MeV: $\pm 10\%$

40 keV to 160 keV: + 20%, - 10%

20 keV to 40 keV: + 20%, - 30%

Accuracy Within $\pm 10\%$ of true exposure

Rate response Dose rate independent for gamma and x-radiation

Electrical leakage Less than 0.5% of full scale for 24 hours at 50°C

Relative humidity Up to 90%

Detector Fiber electrometer mounted in an electrically-conducting plastic ion chamber

Material

Detector housing Very low permeability plastics; hermetically-sealed

Clip Glass fiber-filled, high-strength plastic

Dimensions 0.6 in \varnothing x 4.5 (l) (1.5 x 12.4 cm)

Weight 0.06 lb (0.03 kg)

Available model(s)

06-007 Direct-Reading Pocket Dosimeter, 0 to 200 mR; Black Clip

06-007-2200 Direct-Reading Pocket Dosimeter, 0 to 2 mSv; Black Clip

06-611 Direct-Reading Pocket Dosimeter, 0 to 5 R; Blue Clip

Available model(s) (continued)

06-622 Direct-Reading Pocket Dosimeter, 0 to 20 R; Green Clip

06-638 Direct-Reading Pocket Dosimeter, 0 to 200 R; Yellow Clip

06-686 Direct-Reading Pocket Dosimeter, 0 to 600 R; Red Clip

For additional information, please contact Cardinal Health, Radiation Management Services customer service at 440.248.9300, 800.850.4608, or fax: 440.349.2307; located at 6045 Cochran Road, Cleveland, Ohio 44139-3303, USA.

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Dosimeter Accessories

Models 06-201 to 06-912

RS

Radiation Safety

Multi-Dosimeter Checker

- Allows simultaneous testing of up to five or six direct-reading pocket dosimeters
- ^{137}Cs source requires no license. The Multi-Dosimeter Checkers consist of a plastic cylinder containing either five or six holes surrounding a central, hermetically-sealed, 9 μCi ^{137}Cs source

This device makes checking dosimeters easy. Properly charged and zeroed dosimeters are placed in the cylinder and exposed for the required period of time, depending on their range. Typically, a six-hour exposure of a properly-calibrated dosimeter will yield a reading from 25 to 35 mR.

Note: The hole diameter of Model 06-201 is larger than the hole diameter of Model 06-201-5000.

Specifications

Radioactive source 9 μCi ^{137}Cs source

Cylinder materials Cylinder material is PVC

Dimensions

Checker 2.5 in \varnothing x 2.5 (h)

Hole Model 06-201 0.6 in \varnothing x 2.5 in (d) (1.6 x 6.4 cm)

Hole Model 06-201-5000 0.807 in \varnothing x 2.5 (d) (2.1 x 6.4 cm)

Weight 0.5 lb (0.22 kg)

Available model(s)

06-201 Multi-Dosimeter Checker, six holes

06-201-5000 Multi-Dosimeter Checker, five holes



Dosimeter Charger and Storage Case Kit

- Convenient and cost-effective

Here you get the standard Dosimeter Charger (Model 06-912) in a rugged leatherette-covered case that holds up to 12 dosimeters. A chart conveniently affixed inside the case permits quick identification of each dosimeter and its user. The charger can be easily removed for battery change.

Specifications

Dimensions 5.25 (w) x 9.5 (d) x 5 in (h) (13.34 x 24.13 x 12.7 cm)

Weight 5 lb (2.3 kg)

Available model(s)

06-907 Dosimeter Charger and Storage Case Kit

06-907-1000 Dosimeter Storage Case without Charger



Dosimeter Charger

- For zeroing direct-reading dosimeters

This transistorized power supply zeroes all direct-reading dosimeters. A safety spring in the charging socket prevents damage from excessive pressure on the dosimeter. A protective cap keeps the socket free of dust

and moisture when charger is not in use. One standard 1.5 V "D" cell battery (not included) permits thousands of chargings.

Specifications

Dimensions 4 (w) x 4 (d) x 3 in (h) (10 x 10 x 7.6 cm)

Weight 1 lb (0.45 kg)

Available model(s)

06-912 Dosimeter Charger



For additional information, please contact Cardinal Health, Radiation Management Services customer service at 440.248.9300, 800.850.4608, or fax: 440.349.2307; located at 6045 Cochran Road, Cleveland, Ohio 44139-3303, USA.

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Prima® IIB Personal Radiation Warning Monitor

Victoreen® Model 05-205

- Ideal for personnel working in and around areas of variable radiation
- Provides audible indication of radiation rates
- Effective for gamma and x-ray sources
- Dual-range feature with volume control
- Compact and lightweight

Introduction

The Prima is a dual-range, pocket-sized, continuous warning device that sounds when the user is entering a radiation area or moving from one radiation field to another of different intensity. This lightweight (4 ounce) unit can be clipped to a shirt, lab coat, belt or lead apron.

The Prima responds to radiation by emitting a short, constant-pitch “chirp” at a frequency that varies with changes in radiation intensity. A high and low-rate switch allow the user to adjust the monitor for the environment in which it will be used.

Applications

For gamma radiation areas, the Prima emits approximately 1 chirp per minute (low sensitivity) or 10 chirps per minute (high sensitivity) in a 10 mR/hr field, as measured with ¹³⁷Cs. In addition to warning the wearer of different radiation intensities, the Prima can be hand-held and used to identify contaminated equipment, locate radioactive sources, or to train new radiation personnel.

As an x-ray monitor, the Prima may help reduce exposure during fluoroscopy. In the presence of x-radiation, the unit functions as an indicator of relative radiation intensity. By slight shifts in position (to reduce the “chirping” rate), the fluoroscopist can avoid some personal exposure. The Prima also helps locate leakage or excessive stray radiation. The monitor alerts the user when a radiation area is being entered and when movement from one radiation field to another of different intensity has occurred.



Specifications

Features The rugged plastic case has a positive-closure clip for easy attachment to a garment or belt

Detector Silicon diode

Power requirements One 9 V alkaline battery provides approximately six months under normal 8 hours/day operation

Dimensions 2.2 (w) x 3.4 (h) x 1 in (t)
(5.6 x 8.6 x 2.5 cm)

Weight 0.25 lb (0.11 kg)

Optional accessories

Check Source, ¹³⁷Cs, 10 µCi. Flat disc, 1 inch diameter (Model 62-103)

Available model(s)

05-205 Prima IIB Personal Radiation Warning Monitor, with volume control

For additional information, please contact Cardinal Health, Radiation Management Services customer service at 440.248.9300, 800.850.4608, or fax: 440.349.2307; located at 6045 Cochran Road, Cleveland, Ohio 44139-3303, USA.

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