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Radiation measurement for your safety

ELECTRONIC PERSONAL DOSIMETER PM1300GN

GAMMA-NEUTRON EPD WITH EXTENDED RANGE OF REGISTERED ENERGIES

Purpose

PM1300GN is a compact direct-reading gamma-neutron electronic personal dosimeter designed for real-time control of radiation situation and measurement of personnel exposure. The instrument may be used both for autonomous work and as a part of automatic personnel exposure monitoring system (APDS).

Functions

- Measurement of personal dose equivalent (dose $H_p(10)$) and personal dose equivalent rate (dose rate $\dot{H}_p(10)$) of continuous and pulsed photon radiation
- Measurement of dose $H_p(10)$ and dose rate $\dot{H}_p(10)$ of neutron radiation
- Alarming in case the preset dose or dose rate threshold is exceeded
- Recording up to 10 000 events in the history
- Wireless data exchange via RF-interface and wired data exchange via USB-interface

Features

- Extended range of registered energies
- Long battery life: up to three months from one power element
- Quick response to the dose rate changes
- Remote control of personnel dose exposure while conducting radiation-hazardous works
- Creation of a database of personnel radiation burden

Application

- Nuclear power plants
- Medical institutions
- Oil and gas industry
- Radiological and isotope laboratories
- Processing and transportation of radioactive materials

ELECTRONIC PERSONAL DOSIMETER PM1300GN

Complies and exceeds the requirements of IEC 61526, ANSI 42.20

Dosimeter specifications

- **Detector:**
  - gamma: energy compensated silicon PIN diode
  - neutron: silicon semiconductor
- **Dose $H_p(10)$ measurement range:**
  - gamma: 1 μSv – 20 Sv
  - neutron: 10 μSv – 20 Sv
- **Dose $\dot{H}_p(10)$ rate measurement range:**
  - gamma: 1 μSv/h – 10 Sv/h
  - neutron: 50 μSv/h – 0.2 Sv/h
- **Energy range:**
  - gamma: 15 keV – 20 MeV
  - neutron: 0.025 eV – 15 MeV
- **Measurement accuracy:**
  - dose $H_p(10)$ gamma: ±15 %
  - dose rate $\dot{H}_p(10)$ gamma: ±15 %
  - dose $H_p(10)$ neutron: $\pm(15+100/\sqrt{H_p(10)})$ % (will be specified)
  - dose rate $\dot{H}_p(10)$ neutron: $\pm(15+375/\sqrt{t \cdot \dot{H}_p})$ % (will be specified)

  where $H_p(10)$ – measured dose $H_p(10)$, $\dot{H}_p(10)$ – measured dose rate $\dot{H}_p(10)$, t – time of dose rate $\dot{H}_p(10)$ measurement
- **Energy response:**

  In gamma radiation dose rate $\dot{H}_p(10)$ measurement mode, relative to 0.662 MeV (^{137}Cs):
  - from 15 keV to 7 MeV ±15%
  - from 7 MeV to 20 MeV ±40%

  In neutron radiation dose rate $\dot{H}_p(10)$ measurement mode, relative to collimated radiation of the ^{239}Pu-Be (α, n) source:
  - 30% up to + 80%
- **Thresholds:** 2 independent thresholds for both dose and dose rate
- **Power supply**: standard battery or NiMH accumulator (AAA)
- **Operation conditions:**
  - temperature: from −20 °C to 50 °C
  - humidity: up to 95% at 40 °C
  - atmospheric pressure: from 84 to 106.7 kPa
- **Ingress protection:** IP67

  Dimensions:
  - 130x57x35 mm with clip
  - 130x57x25 mm without clip
- **Mass** (with clip and battery): ≤ 200 g

Reader specifications

- **Operation frequency range:** 2.4 GHz
- **Adjustable readout distance**: from 20 cm up to 10 m
- **Output power:** 1mW
- **PC communication:** USB, Ethernet, RS-485
- **Number of stored events:** up to 50000
- **Power supply:**
  - 5V, up to 500 mA (USB);
  - backup battery – 1 AAA accumulator
- **Operation conditions:**
  - temperature: from −10 °C to 50 °C
  - humidity: up to 98% at 40°C
  - atmospheric pressure: from 84 to 106.7 kPa
- **Ingress protection:** IP40
- **Dimensions:** 100 × 100 × 50 mm
- **Mass:** ≤ 400 g

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Dosimeter as part of the Automated Personal Dosimetry System (APDS)

The dosimeter is easily integrated with both new and already installed APDS equipment. As part of the complex dosimetry system, the dosimeter allows to solve problems of access control to premises, real time monitor of personnel radiation burden, automate the procedure for admitting personnel to perform radiation-hazardous work, as well as creating systems for monitoring the movement of personnel in controlled access zones.

RF interface

Dosimeter is equipped with a wireless data exchange module which allows:

automated registration of the personnel in exposure monitoring system and issuing personal radiological work permits

- additional control of the personnel access to controlled premises based on issued personal radiological work permits
- remote control of the access, movement, location, and duty hours of personnel in the restricted areas
- simultaneous transmission of measurement results to the personnel exposure monitoring system
- monitor of the personnel movement in controlled premises during inspections.

The reader may be located autonomously in different zones of the controlled areas and simultaneously receive data from several dosimeters in the acquisition range and may be built in different gadgets like turn gates, info desks, etc.

Automated storage rack

Dosimeter maintains its operation with automated storage rack for the group dosimeter storage which enables:

- storing and controlling the access to the set of personal dosimeters by means of authorization in facial recognition system or entering access code
- remote adjusting of the instrument parameters including personal radiological work permits data recording
- data exchange via RF- or USB-interface and data transmission to the APDS data base
- detection of dosimeters surface contamination with alpha and beta radionuclides
- accumulator battery charging via USB-interface.

CE

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