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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 34142-2017

**Radiation protection instrumentation -- Highly sensitive
hand-held instruments for photon detection of radioactive
material**

辐射防护仪器 用于放射性物质光子探测的高灵敏手持式仪器

(English Translation)

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Table of Contents

Foreword
1 Scope
2 Normative references
3 Terms and definitions, abbreviations, quantities and units
3.1 Terms and definitions
3.2 Abbreviations
3.3 Volume and unit
4 General requirements
4.1 General characteristics
4.2 Physical Structure
4.3 Basic information
4.4 Communication Interface
4.5 User Interface
4.6 Warm-up time
4.7 Logo
4.8 Power
4.9 Control and Protection
4.10 Photon around the dose equivalent rate instructions
4.11 Alarm
4.12 Effective measurement range
4.13 Angle dependency
4.14 Explosive air
4.15 Indicator Features
5 General test methods
5.1 Experimental nature
5.2 Reference conditions and standard test conditions
5.3 Reference gamma radiation background
5.4 Statistics Fluctuation
6 Radiation test
6.1 (Source tips) false alarm rate
6.2 Source alarm and response time
6.3 Personal protection alarm and response time

6.4 Around the dose equivalent rate indicator value

6.5 Around the dose equivalent rate of overload indicator characteristics

7 Additional features

7.1 Overview

7.2 Mobile use removed when the natural changes encountered in the background

7.3 Classification of sources

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the translation method identical with IEC 62533:2010 "Radiation protection instrumentation for photon detection of radioactive substances highly sensitive Handheld instrument. " the documents of our country that have consistent correspondence with the international standards that are normative references in this standard are as follows.

--- GB/T 4208-2008 enclosure protection (IP code) (IEC 60529:2001, IDT);

Electromagnetic compatibility test and measurement techniques Electrostatic discharge immunity test (IEC 61000-4-2).

2001, IDT);

--- GB/T 17626.3-2006 Electromagnetic compatibility test and measurement techniques RF electromagnetic field radiation immunity test (IEC 61000-4-3:2002, IDT);

--- GB/T 17626.6-2008 electromagnetic compatibility test and measurement techniques RF field induced conduction disturbances immunity (IEC 61000-4-6:2006, IDT).

This standard proposed by China National Nuclear Corporation.

This standard by the National Nuclear Instrument Standardization Technical Committee (SAC/TC30) centralized.

This standard was drafted unit. Nuclear Industrial Standardization Institute, Xiamen City, metrological testing institute, Xiamen Minya Zhongmin Electronic Technology Co., Ltd..

1 Scope

This standard applies to the detection and positioning of photons emitted radioactive handheld devices. These highly sensitive instruments are designed primarily for the purpose Used to detect subtle changes within the normal background caused by the illicit trafficking or unintentional transfer of radioactive material. With pocket-sized instrument (See GB/T 31835-2015), high-sensitivity instruments allow scanning large volume items

such as vehicles or containers. In order to monitor the inspection Points or hazardous areas, these instruments also allow fixed or temporarily fixed unattended use.

These instruments also provide ambient dose equivalent rate indications generated by photon radiation. However, this standard does not apply to GB/T 4835.1-2012 and GB/T 13161-2015 radiation protection equipment involved in the performance.

These instruments provide the following additional functions (not including the portable instruments specified in GB/T 31837-2015 for nuclide identification all the features).

- When used in the movement, the suppression of natural background fluctuations;
- According to the concerns of natural radioactive substances (NORM) alarm or medical radionuclide alarm classification;
- Remote source classification data (including limited photon spectrum).

The purpose of this standard is to establish performance requirements, including physical characteristics, general test conditions, radiation characteristics, electrical safety and environmental conditions.

In order to determine whether the instrument meets the requirements of this standard, this standard provides examples of acceptable test methods. Test results provide users with spokes Radiation detection equipment reliable detection of photon source capability information.

Equipment to meet or exceed the technical requirements of this standard performance requirements depend on the correct establishment of appropriate working parameters, the implementation of school Proper implementation of appropriate response testing and maintenance procedures, formal training of operators and development of exercises that take into account instrument limitations and capabilities as a method.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 2423.55-2006 Environmental testing for electric and electronic products Part 2. Environmental test Eh. Hammer test (IEC 60068-2-75:1997, IDT) GB/T 2900.81-2008 Electrotechnical terminology Nuclear physics and basic concepts (IEC 60050-393:2003, IDT) GB/T 2900.82-2008 Electrotechnical terminology Instruments Instruments, systems, equipment and detectors (IEC 60050-394:2007, IDT) Part 1. X and gamma reference radiations for calibration of dosimeters and dose rate meters and determination of their response.

Radiation characteristics and methods of production (ISO 4037-1:1996, IDT) X and gamma

reference radiations for the calibration of dosimeters and dose rate meters and determination of their response - Part 2. GB/T 12162.2-2004.

Radiation protection with the energy range of 8keV ~ 1.3MeV and 4MeV ~ 9MeV reference radiation dosimetry (ISO 4037-2.

1997, IDT)

X and gamma reference radiations for the calibration of dosimeters and dose rate meters and determination of their response - Part 3. GB/T 12162.3-2004.

Calibration of site dosimeters and personal dosimeters and determination of their energy response and angular response (ISO 4037-3:1999, IDT) IEC 60529:1989 Enclosure rating (IP code) IEC 61000-4-2:2008 Electromagnetic compatibility (EMC) part 4-2. Testing and measurement techniques - Electrostatic discharge immunity test