

Radiation protection instrumentation -
Spectroscopy-based portal monitors used for the
detection and identification of illicit trafficking of
radioactive material

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Radiation protection instrumentation - Spectroscopy-based
portal monitors used for the detection and identification of illicit
trafficking of radioactive material
(IEC 62484:2010)

Instrumentation pour la radioprotection - Moniteurs
spectroscopiques pour portiques d'accès utilisés pour la
détection et l'identification du trafic illicite des matières
radioactives
(IEC 62484:2010)

Strahlenschutz-Messgeräte - Auf Spektroskopie basierende
Portalmonitore für den Nachweis und die Identifikation des
unerlaubten Handels mit radioaktiven Stoffen
(IEC 62484:2010)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (EN 62484:2015) consists of the text of IEC 62484:2010 prepared by SC 45B "Radiation protection instrumentation" of IEC/TC 45 "Nuclear instrumentation".

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-11-02
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-11-02

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60038	NOTE	Harmonized as EN 60038.
IEC 60068-2-75	NOTE	Harmonized as EN 60068-2-75.
IEC 60846	NOTE	Harmonized in EN 60846 series.
IEC 61526:2010	NOTE	Harmonized as EN 61526:2013 (modified).
IEC 62327:2006	NOTE	Harmonized as EN 62327:2011 (modified).

CONTENTS

FOREWORD.....	5
1 Scope and object.....	7
2 Normative references	7
3 Terms and definitions, abbreviations, quantities and units	8
3.1 Terms and definitions	8
3.2 Abbreviations	10
3.3 Quantities and units	11
4 Design requirements	12
4.1 General requirements.....	12
4.1.1 Pedestrian monitor	12
4.1.2 Vehicle monitor.....	13
4.1.3 Rail vehicle monitor (includes rail transported containers)	13
4.1.4 Package (or conveyor) monitor	13
4.2 Physical configuration	14
4.3 Spectral identification and count rate information	14
4.4 Indication features.....	15
4.5 Occupancy and speed sensors for vehicle monitors	15
4.6 Markings	15
4.7 Power supply.....	15
4.7.1 Requirements	15
4.7.2 Method of test	16
4.8 Protection of switches	16
4.9 Energy and count rate range	16
4.10 Communications protocol and data format.....	16
4.11 User interface.....	16
4.11.1 Guidance regarding alarm logic	16
4.11.2 Audible (sound) alarm	17
4.11.3 Visual indicators	17
4.11.4 Warning indicators.....	17
4.11.5 Basic indications and functions.....	17
4.11.6 Advanced indications and functions.....	18
5 Radiation detection and indication performance requirements	18
5.1 General test conditions.....	18
5.1.1 Nature of tests.....	18
5.1.2 Reference conditions and standard test conditions	18
5.1.3 Statistical fluctuations.....	18
5.2 Reference radiation	19
5.3 Alarm categorization.....	19
5.4 False alarms	19
5.4.1 Requirements	19
5.4.2 Method of test	19
5.5 Response to gamma radiation	19
5.5.1 Requirements	19
5.5.2 Method of test	19
5.6 Radiation intensity and identification alarm.....	20
5.6.1 Requirements	20

5.6.2	Method of test	20
5.7	Response to neutron radiation.....	20
5.7.1	Requirements	20
5.7.2	Method of test	20
5.8	Over-range.....	20
5.8.1	Requirements	20
5.8.2	Method of test	21
5.9	Neutron indication in the presence of photons	21
5.9.1	Requirements	21
5.9.2	Method of test	21
5.10	Background effects.....	21
5.10.1	Requirements	21
5.10.2	Method of test	21
5.11	Radionuclide identification.....	22
5.11.1	Radionuclide categorization.....	22
5.11.2	Radionuclide identification qualification	22
5.11.3	General requirements for testing radionuclide identification ability	22
5.11.4	Single radionuclide identification	23
5.11.5	Identification of shielded radionuclides	24
5.11.6	Simultaneous radionuclide identification and masking.....	25
5.11.7	Over-range characteristics for identification	26
5.11.8	Pile-up effects	26
5.11.9	Radionuclide not in library	27
5.12	Environmental tests.....	27
5.12.1	Ambient temperature	27
5.12.2	Humidity tests.....	28
5.12.3	Dust and moisture resistance tests	28
5.13	Mechanical requirements.....	29
5.13.1	Vibration.....	29
5.13.2	Microphonics/Impact.....	30
5.14	Electromagnetic performance requirements.....	30
5.14.1	Electrostatic discharge (ESD).....	30
5.14.2	Radio frequency	30
5.14.3	Radiated RF emissions	31
5.14.4	Conducted disturbances	31
5.14.5	Magnetic fields	31
5.14.6	Surges and oscillatory waves	32
6	Documentation	32
6.1	Type test report.....	32
6.2	Certificate	32
6.3	Operation and maintenance manuals.....	32
Annex A (informative)	Identification of uranium isotopes	36
Bibliography	37
Figure 1	– Diagram of mounting dimensions for radionuclide identifying portal monitors	9
Table 1	– Speed of moving sources	33
Table 2	– Evaluation distances for different applications	33

Table 3 – Reference and standard test conditions.....	34
Table 4 – Approximate activity values for gamma-ray and neutron sources.....	34
Table 5 – Example of alarm categorizations.....	35
Table 6 – Emission limits	35
Table A.1 – Uranium detection and identification guidance	36

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RADIATION PROTECTION INSTRUMENTATION – SPECTROSCOPY-BASED PORTAL MONITORS USED FOR THE DETECTION AND IDENTIFICATION OF ILLICIT TRAFFICKING OF RADIOACTIVE MATERIAL

1 Scope and object

This International Standard specifies the operational and performance requirements for spectroscopy-based portal monitors used for the detection and identification of illicit trafficking of radioactive material. Spectroscopy-based portal monitors have the ability to detect gamma and neutron radiation and identify gamma-emitting radionuclides that may be present in or on persons, vehicles, containers, or packages in a static or transient mode of operation.

Operational requirements established by this standard include radiation detection and gamma-emitting radionuclide identification, and those requirements associated with the expected electrical, mechanical, and environmental conditions when a portal monitor is deployed.

The object of this standard is to establish performance requirements and to give examples of acceptable test methods, and to specify general characteristics, general test conditions, radiation characteristics, electrical safety, and environmental characteristics to determine if a portal monitor meets the requirements of this standard.

Special applications, which may include a monitor's operation under weather conditions or for detection needs not addressed by this standard, shall require additional testing.

Obtaining operating performance that meets or exceeds the specifications as stated in this standard depends upon properly installing the monitor, establishing appropriate operating parameters, providing security for the monitor, maintaining calibration, implementing a suitable response testing and maintenance program, auditing compliance with quality requirements, and providing proper training for operating personnel.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-393:2003, *International Electrotechnical Vocabulary (IEV) – Part 393: Nuclear instrumentation – Physical phenomena and basic concepts*

IEC 60050-394:2007, *International Electrotechnical Vocabulary (IEV) – Part 394: Nuclear instrumentation – Instruments, systems, equipment and detectors*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
Amendment 1 (1999)

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

ISO 4037-1:1996, *X and gamma reference radiation for calibrating dosimeters and dose rate meters and for determining their response as a function of photon energy – Part 1: Radiation characteristics and production methods*

ISO 4037-2:1997, *X and gamma reference radiation for calibrating dosimeters and dose rate meters and for determining their response as a function of photon energy – Part 2: Dosimetry for radiation protection over the energy ranges from 8 keV to 1,3 MeV and 4 MeV to 9 MeV*

ISO 4037-3:1999, *X and gamma reference radiation for calibrating dosimeters and dose rate meters and for determining their response as a function of photon energy – Part 3: Calibration of area and personal dosimeters and the measurement of their response as a function of energy and angle of incidence*

ISO 8529-1:2001, *Reference neutron radiations – Part 1: Characteristics and methods of production*

ISO 8529-2:2000, *Reference neutron radiations – Part 2: Calibration fundamentals of radiation protection devices related to the basic quantities characterizing the radiation field*

ISO 8529-3:1998, *Reference neutron radiations – Part 3: Calibration of area and personal dosimeters and determination of response as a function of neutron energy and angle of incidence*

International Bureau of Weights and Measures: *The International System of Units, 8th edition, 2006*

3 Terms and definitions, abbreviations, quantities and units

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions, as well as those given in IEC 60050-393 and IEC 60050-394 apply.

3.1.1

acceptable (or correct) identification

when a monitor identifies the radionuclide(s) that are present

3.1.2

alarm

an audible, visual, or other signal activated when the instrument reading exceeds a preset value, falls outside of a preset range, or when the instrument detects and/or identifies the presence of the source of radiation according to a preset condition

[IEV 393-18-03, modified]

3.1.3

alarm criteria

conditions that cause a monitor to alarm

3.1.4

confidence indication

an indication provided by the monitor on the reliability assigned to the determined identification