



# SLOVENSKI STANDARD SIST EN IEC 62327:2019

01-december-2019

Nadomešča:  
SIST EN 62327:2011

---

**Instrumenti za zaščito pred sevanjem - Ročni instrumenti za odkrivanje in prepoznavanje radionuklidov in za prikaz stopnje ekvivalentne doze v prostoru zaradi fotonskega sevanja (IEC 62327:2017)**

Radiation protection instrumentation - Hand-held instruments for the detection and identification of radionuclides and for the estimation of ambient dose equivalent rate from photon radiation (IEC 62327:2017)

**ITeH STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN IEC 62327:2019  
<https://standards.iteh.ai/catalog/standards/sist/62327-19/iec/62327-19>  
Instrumentation pour la radioprotection. Instruments portables pour la détection et l'identification des radionucléides et pour l'estimation du débit d'équivalent de dose ambiant pour le rayonnement de photons (IEC 62327:2017)

**Ta slovenski standard je istoveten z: EN IEC 62327:2019**

---

**ICS:**

13.280      Varstvo pred sevanjem      Radiation protection

**SIST EN IEC 62327:2019**      en

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN IEC 62327:2019](#)

<https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019>

EUROPEAN STANDARD

EN IEC 62327

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2019

ICS 13.280

Supersedes EN 62327:2011 and all of its amendments  
and corrigenda (if any)

English Version

Radiation protection instrumentation - Hand-held instruments for  
the detection and identification of radionuclides and for the  
estimation of ambient dose equivalent rate from photon radiation  
(IEC 62327:2017)

Instrumentation pour la radioprotection  $\zeta$  Instruments  
portables pour la détection et l'identification des  
radionucléides et pour l'estimation du débit d'équivalent de  
dose ambiant pour le rayonnement de photons  
(IEC 62327:2017)

To be completed  
(IEC 62327:2017)

This European Standard was approved by CENELEC on 2019-10-07. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

**EN IEC 62327:2019 (E)****European foreword**

The text of document 45B/882/FDIS, future edition 2 of IEC 62327, prepared by SC 45B "Radiation protection instrumentation" of IEC/TC 45 "Nuclear instrumentation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62327:2019.

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) 2020-07-07
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-10-07

This document supersedes EN 62327:2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

### Endorsement notice

[SIST EN IEC 62327:2019](https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019)

[https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-](https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019)

[ace45e927a53/sist-en-iec-62327-2019](https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019)

The text of the International Standard IEC 62327:2017 was approved by CENELEC as a European Standard without any modification.

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

IEC 60086-1:2015            NOTE    Harmonized as EN 60086-1:2015 (not modified)

IEC 60721-3-7            NOTE    Harmonized as EN 60721-3-7

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-395	2014	International Electrotechnical Vocabulary -- Part 395: Nuclear instrumentation: Physical phenomena, basic concepts, instruments, systems, equipment and detectors		-
IEC 60068-2-1	-	Environmental testing - Part 2-1: Tests Test A: Cold	EN 60068-2-1	-
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests Test B: Dry heat	EN 60068-2-2	-
IEC 60068-2-11	-	Basic environmental testing procedures Part 2-11: Tests - Test Ka: Salt mist	EN 60068-2-11	-
IEC 60068-2-14	-	Environmental testing - Part 2-14: Tests Test N: Change of temperature	EN 60068-2-14	-
IEC 60068-2-18	-		EN 60068-2-18	-
IEC 60068-2-27	2008	Environmental testing - Part 2-27: Tests Test Ea and guidance: Shock	EN 60068-2-27	2009
IEC 60068-2-64	-	Environmental testing - Part 2-64: Tests Test Fh: Vibration, broadband random and guidance	EN 60068-2-64	-
IEC 60068-2-66	-	Environmental testing - Part 2: Test methods - Test Cx: Damp heat, steady state (unsaturated pressurized vapour)	EN 60068-2-66	-
IEC 60068-2-68	-	Environmental testing - Part 2-68: Tests Test L: Dust and sand	EN 60068-2-68	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)		-
IEC 60846-1 (mod)	-	Radiation protection instrumentation Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation - Part 1: Portable workplace and environmental meters and monitors	EN 60846-1	-
IEC 60846-2 (mod)	-	Radiation protection instrumentation Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation - Part 2: High range beta and photon dose and dose rate portable instruments for emergency radiation protection purposes	EN 60846-2	-

## EN IEC 62327:2019 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-2	2008	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	2009
IEC 61000-4-3	2006	Electromagnetic compatibility (EMC) - Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	2006
IEC 61000-4-6	2013	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2014
IEC 61000-4-8	2009	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	2010
IEC 61005 (mod)	-		EN 61005	-
IEC 61187 (mod)	-	Electrical and electronic measuring equipment - Documentation	EN 61187	-
			+EN 61187:1994/corrigendum Mar. 1995	1995
IEC 62706	-	Radiation protection instrumentation -- Environmental, electromagnetic and mechanical performance requirements		-
IEC 62755	-	Radiation protection instrumentation - Data-format for radiation instruments used in the detection of illicit trafficking of radioactive materials		-

iTeH STANDARD PREVIEW  
(standards.iteh.ai)

[SIST EN IEC 62327:2019](https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019)

<https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019>



IEC 62327

Edition 2.0 2017-12

# INTERNATIONAL STANDARD

**Radiation protection instrumentation – Hand-held instruments for the detection and identification of radionuclides and for the estimation of ambient dose equivalent rate from photon radiation**

[SIST EN IEC 62327:2019](https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019)

<https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019>

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 13.280

ISBN 978-2-8322-5182-9

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references .....	8
3 Terms and definitions, abbreviated terms and symbols, quantities and units.....	9
3.1 Terms and definitions.....	9
3.2 Abbreviated terms and symbols .....	11
3.3 Quantities and units .....	12
4 General characteristics and requirements.....	12
4.1 General.....	12
4.2 Radiation detectors.....	12
4.3 Personal protection alarm .....	12
4.3.1 Requirements .....	12
4.3.2 Method of test.....	12
4.4 Stabilization time .....	13
4.4.1 Requirements .....	13
4.4.2 Method of test.....	13
4.5 Power supplies – battery.....	13
4.5.1 Requirements .....	13
4.5.2 Method of test.....	13
4.6 Markings.....	14
4.7 Communication interface.....	14
4.7.1 Requirements.....	14
4.7.2 Method of test.....	14
4.8 Data.....	14
4.8.1 Requirements .....	14
4.8.2 Method of test.....	15
5 General test procedures .....	15
5.1 Nature of test.....	15
5.2 Statistical fluctuations .....	15
5.3 Standard test conditions .....	15
5.4 Functionality test.....	16
5.4.1 General .....	16
5.4.2 Pre-test measurements.....	16
5.4.3 Intermediate measurements.....	16
5.4.4 Post-test measurements .....	16
6 Radiation detection requirements .....	17
6.1 Ambient dose equivalent rate.....	17
6.1.1 Requirements .....	17
6.1.2 Method of test.....	17
6.2 Gamma source localization .....	17
6.2.1 Requirements .....	17
6.2.2 Method of test.....	17
6.3 Over-range characteristics for ambient dose equivalent rate .....	18
6.3.1 Requirements .....	18
6.3.2 Method of test.....	18



6.4	Neutron detection .....	18
6.4.1	Requirements .....	18
6.4.2	Method of test.....	19
6.5	Neutron indication in the presence of photons.....	19
6.5.1	Requirements .....	19
6.5.2	Method of test.....	19
6.6	Radionuclide identification .....	20
6.6.1	Radionuclide identification library .....	20
6.6.2	Identification results .....	20
6.6.3	Radionuclide and radioactive material identification.....	21
6.6.4	Identification of mixed radioactive materials.....	22
7	Environmental requirements .....	23
7.1	General.....	23
7.2	Ambient temperature.....	23
7.2.1	Requirements .....	23
7.2.2	Method of test.....	23
7.3	Temperature shock .....	23
7.3.1	Requirements .....	23
7.3.2	Method of test.....	24
7.4	Relative humidity .....	24
7.4.1	Requirements .....	24
7.4.2	Method of test.....	24
7.5	Low/high temperature start-up .....	24
7.5.1	Requirements .....	24
7.5.2	Method of test.....	25
7.6	Moisture and dust protection.....	25
7.6.1	Requirements .....	25
7.6.2	Method of test – dust .....	25
7.6.3	Method of test – moisture .....	25
8	Mechanical requirements.....	26
8.1	General.....	26
8.2	Vibration .....	26
8.2.1	Requirements .....	26
8.2.2	Method of test.....	26
8.3	Mechanical shock .....	26
8.3.1	Requirements .....	26
8.3.2	Method of test.....	26
8.4	Impact (microphonics).....	26
8.4.1	Requirements .....	26
8.4.2	Method of test.....	27
9	Electromagnetic requirements .....	27
9.1	General.....	27
9.2	Electrostatic Discharge (ESD).....	27
9.2.1	Requirements .....	27
9.2.2	Method of test.....	27
9.3	Radio Frequency (RF).....	27
9.3.1	Requirements .....	27
9.3.2	Method of test.....	27
9.4	Radiated RF emissions .....	28

9.4.1	Requirements .....	28
9.4.2	Method of test.....	28
9.5	Conducted disturbances.....	28
9.5.1	Requirements .....	28
9.5.2	Method of test.....	29
9.6	Magnetic fields.....	29
9.6.1	Requirements .....	29
9.6.2	Method of test.....	29
10	Documentation .....	29
10.1	Operation and maintenance manual.....	29
10.2	Test certificate .....	30
10.3	Declaration of conformity .....	30
	Bibliography.....	33
	Table 1 – IEC standards concerning instruments for the detection of illicit trafficking of radioactive material .....	7
	Table 2 – Standard test conditions .....	15
	Table 3 – Test result analysis .....	17
	Table 4 – Radionuclide library.....	20
	Table 5 – Guidance regarding identification performance.....	22
	Table 6 – List of likely daughters and possible impurities.....	22
	Table 7 – Emission frequency limits .....	28
	Table 8 – Summary of performance requirements.....	31

<https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RADIATION PROTECTION INSTRUMENTATION –  
HAND-HELD INSTRUMENTS FOR THE DETECTION AND IDENTIFICATION  
OF RADIONUCLIDES AND FOR THE ESTIMATION OF AMBIENT DOSE  
EQUIVALENT RATE FROM PHOTON RADIATION**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62327 has been prepared by subcommittee 45B: Radiation protection instrumentation, of IEC technical committee 45: Nuclear instrumentation.

This second edition cancels and replaces the first edition of IEC 62327, issued in 2006. It constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) addition of detailed methods of test;
- b) revised identification test acceptance criteria for environmental tests;
- c) changed format to match SC 45B template.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
45B/882/FDIS	45B/887/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN IEC 62327:2019](#)

<https://standards.iteh.ai/catalog/standards/sist/63694ae8-d3f7-4af7-a6ee-ace45e927a53/sist-en-iec-62327-2019>