



**SLOVENSKI STANDARD
SIST EN IEC 62618:2024**

01-maj-2024

Instrumenti za zaščito pred sevanjem - Spektroskopski alarmni osebni detektorji sevanja za odkrivanje nedovoljenega prometa z radioaktivnimi snovmi (IEC 62618:2022)

Radiation protection instrumentation - Spectroscopy-based alarming personal radiation detectors (SPRD) for the detection of illicit trafficking of radioactive material (IEC 62618:2022)

Strahlenschutz-Messgeräte - Spektroskopie-basierte alarmgebende persönliche Strahlungsdetektoren für den Nachweis von unerlaubt transportiertem radioaktivem Material (IEC 62618:2022)

Instrumentation pour la radioprotection - Détecteurs individuels spectroscopiques d'alarme aux rayonnements (SPRD) pour la détection du trafic illicite des matières radioactives (IEC 62618:2022)

<https://standards.iteh.ai/catalog/standards/sist/fcf379be-dd77-43f0-8fe6-4e8f177cd076/sist-en-iec-62618-2024>

Ta slovenski standard je istoveten z: EN IEC 62618:2024

ICS:

13.280	Varstvo pred sevanjem	Radiation protection
13.320	Alarmni in opozorilni sistemi	Alarm and warning systems

SIST EN IEC 62618:2024

en

EUROPEAN STANDARD

EN IEC 62618

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2024

ICS 13.280

Supersedes EN 62618:2016

English Version

Radiation protection instrumentation - Spectroscopy-based
alarming personal radiation detectors (SPRD) for the detection of
illicit trafficking of radioactive material
(IEC 62618:2022)

Instrumentation pour la radioprotection - Détecteurs
individuels spectroscopiques d'alarme aux rayonnements
(SPRD) pour la détection du trafic illicite des matières
radioactives
(IEC 62618:2022)

Strahlenschutz-Messgeräte - Spektroskopie-basierte
alarmgebende persönliche Strahlungsdetektoren für den
Nachweis von unerlaubt transportiertem radioaktivem
Material
(IEC 62618:2022)

This European Standard was approved by CENELEC on 2024-01-22. 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, Türkiye and the United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/fcf379be-dd77-43f0-8fe6-4e8f177cd076/sist-en-iec-62618-2024>



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 62618:2024 (E)**European foreword**

This document (EN IEC 62618:2024) consists of the text of IEC 62618:2022 prepared by IEC/SC 45B "Radiation protection instrumentation" of IEC/TC 45 "Nuclear instrumentation".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2025-01-22
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2027-01-22

This document supersedes EN 62618:2016 and all of its amendments and corrigenda (if any).

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.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62618:2022 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 standard indicated:

IEC 60068-2-11	NOTE	Approved as EN IEC 60068-2-11
IEC 60846-1	NOTE	Approved as EN 60846-1
IEC 61526	NOTE	Approved as EN 61526
IEC 62244	NOTE	Approved as EN IEC 62244
IEC 62327	NOTE	Approved as EN IEC 62327
IEC 62401	NOTE	Approved as EN IEC 62401
IEC 62484	NOTE	Approved as EN IEC 62484
IEC 62533	NOTE	Approved as EN 62533
IEC 62534	NOTE	Approved as EN 62534
IEC 62694	NOTE	Approved as EN 62694
IEC 63121	NOTE	Approved as EN IEC 63121

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.cencenelec.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	-	-
+ A1	2016		-	-
+ A2	2020		-	-
IEC 60079-11	-	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"	-	-
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	-	-
IEC/TR 62971	2015	Radiation instrumentation - Radiation sources used in illicit trafficking detection standards - Guidance and recommendations	-	-
UL 913	-	Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III, Division 1, Hazardous (Classified) Locations	-	-
ICRU report 39	-	Determination of Dose Equivalents Resulting from External Radiation Sources	-	-
ICRU report 47	-	Measurement of Dose Equivalents from External Photon and Electron Radiations	-	-



IEC 62618

Edition 2.0 2022-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Radiation protection instrumentation – Spectroscopy-based alarming personal radiation detectors (SPRD) for the detection of illicit trafficking of radioactive material

Instrumentation pour la radioprotection – Détecteurs individuels spectroscopiques d'alarme aux rayonnements (SPRD) pour la détection du trafic illicite de matières radioactives

[SIST EN IEC 62618:2024](https://standards.iteh.ai/catalog/standards/sist/fcf379be-dd77-43f0-8fe6-4e8f177cd076/sist-en-iec-62618-2024)

<https://standards.iteh.ai/catalog/standards/sist/fcf379be-dd77-43f0-8fe6-4e8f177cd076/sist-en-iec-62618-2024>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 13.280

ISBN 978-2-8322-6050-0

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions, abbreviated terms and symbols, quantities and units.....	8
3.1 Terms and definitions.....	8
3.2 Abbreviated terms and symbols	10
3.3 Quantities and units	10
4 General test procedure	11
4.1 Standard test conditions	11
4.2 Uncertainties.....	11
4.3 Statistical fluctuations	11
4.4 Background radiation during testing	12
4.5 Operating parameters and set up.....	12
4.6 Radiation sources	12
4.7 Special nuclear material (SNM) and depleted uranium (DU) sources.....	12
4.8 Speed of moving sources including scaling	12
4.9 Functionality test and test acceptance range requirements	13
4.10 Neutron measurement requirements	15
5 General requirements	16
5.1 Basic information	16
5.2 Mechanical characteristics	16
5.3 Data output.....	17
5.4 User indications	17
5.5 Markings	17
5.6 Alarms	18
6 Radiation detection requirements	18
6.1 False alarm rate.....	18
6.2 Gamma alarm	18
6.3 Personal protection alarm	19
6.4 Relative intrinsic error.....	19
6.5 Detection of gradually increasing radiation levels.....	20
6.6 Over-range	20
6.7 Detection of neutrons (if provided)	20
6.8 Gamma response of neutron detector (if provided).....	21
6.9 Identification of single radionuclides	22
6.10 Simultaneous radionuclide identification	23
6.11 Low-exposure rate identification.....	23
6.12 Over range characteristics for identification	23
7 Environmental requirements	24
7.1 Ambient temperature.....	24
7.2 Temperature shock	24
7.3 Relative humidity	24
7.4 Dust and moisture protection	25
8 Mechanical requirements.....	25
8.1 Vibration	25

8.2	Microphonics/Impact	26
8.3	Drop	26
9	Electromagnetic requirements	26
9.1	Electrostatic discharge (ESD)	26
9.2	Radio frequency (RF).....	27
9.3	Radiated RF emissions	27
9.4	Magnetic fields.....	27
10	Documentation	28
10.1	Operation and maintenance manual.....	28
10.2	Test certificate	28
10.3	Declaration of conformity	28
	Bibliography.....	29
	Table 1 – Overview of IEC radiation protection instrumentation standards	6
	Table 2 – Standard test conditions	11
	Table 3 – Test results analysis.....	15
	Table 4 – Identification acceptance criteria ¹	22

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN IEC 62618:2024](https://standards.iteh.ai/catalog/standards/sist/fcf379be-dd77-43f0-8fe6-4e8f177cd076/sist-en-iec-62618-2024)

<https://standards.iteh.ai/catalog/standards/sist/fcf379be-dd77-43f0-8fe6-4e8f177cd076/sist-en-iec-62618-2024>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RADIATION PROTECTION INSTRUMENTATION –
SPECTROSCOPY-BASED ALARMING PERSONAL
RADIATION DETECTORS (SPRD) FOR THE DETECTION
OF ILLICIT TRAFFICKING OF RADIOACTIVE MATERIAL****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.

IEC 62618 has been prepared by subcommittee 45B: Radiation protection instrumentation, of IEC technical committee 45: Nuclear instrumentation. It is an International Standard.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

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

- a) making the standard consistent with the new standards for detection of illicit trafficking of radioactive material (see the Introduction);
- b) creating unformed functionality test for all environmental, electromagnetic and mechanical tests and a requirement for the coefficient of variation of each nominal mean reading;
- c) reference to IEC 62706 for the environmental, electromagnetic and mechanical test conditions;
- d) adding information regarding climatic exposures.

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

Draft	Report on voting
45B/1011/FDIS	45B/1017/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.

iTeh Standards (<https://standards.iteh.ai>) Document Preview

[SIST EN IEC 62618:2024](https://standards.iteh.ai/catalog/standards/sist/fcf379be-dd77-43f0-8fe6-4e8f177cd076/sist-en-iec-62618-2024)

<https://standards.iteh.ai/catalog/standards/sist/fcf379be-dd77-43f0-8fe6-4e8f177cd076/sist-en-iec-62618-2024>