



SLOVENSKI STANDARD SIST EN IEC 62401:2019

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Instrumenti za zaščito pred sevanjem - Alarmni osebni detektorji sevanja za odkrivanje nedovoljenega prometa z radioaktivnimi snovmi (IEC 62401:2017)

Radiation protection instrumentation - Alarming personal radiation devices (PRDs) for the detection of illicit trafficking of radioactive material (IEC 62401:2017)

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Instrumentation pour la radioprotection - Dispositifs individuels d'alarme aux rayonnements pour la détection du trafic illicite des matières radioactives (IEC 62401:2017)

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

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EUROPEAN STANDARD

EN IEC 62401

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October 2019

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Radiation protection instrumentation - Alarming personal radiation devices (PRDs) for the detection of illicit trafficking of radioactive material
(IEC 62401:2017)

Instrumentation pour la radioprotection - Dispositifs individuels d'alarme aux rayonnements pour la détection du trafic illicite des matières radioactives
(IEC 62401:2017)

To be completed
(IEC 62401:2017)

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.

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

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EN IEC 62401:2019 (E)**European foreword**

The text of document 45B/881/FDIS, future edition 2 of IEC 62401, 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 62401:2019.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-10-07

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

IEC 60079-11	NOTE	Harmonized as EN 60079-11
IEC 60846-1	NOTE	Harmonized as EN 60846-1
IEC 61526	NOTE	Harmonized as EN 61526
IEC 62327	NOTE	Harmonized as EN 62327

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-395	-	International Electrotechnical Vocabulary -- Part 395: Nuclear instrumentation: Physical phenomena, basic concepts, instruments, systems, equipment and detectors	-	-
IEC 60068-2-11	-	Basic environmental testing procedures -- Part 2-11: Tests - Test Ka: Salt mist	EN 60068-2-11	-
IEC 62706	2012	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	-	-

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INTERNATIONAL STANDARD

**Radiation protection instrumentation – Alarming personal radiation devices
(PRDs) for the detection of illicit trafficking of radioactive material**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RADIATION PROTECTION INSTRUMENTATION – ALARMING PERSONAL RADIATION DEVICES (PRDs) FOR THE DETECTION OF ILLICIT TRAFFICKING OF RADIOACTIVE MATERIAL

FOREWORD

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International Standard IEC 62401 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 62401, issued in 2007. It 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) changing some requirements:
 - removal of the 2 levels of background levels (high and low) needed for the different tests. Only one background level (laboratory) remains,
 - the gamma alarm is tested using moving sources and not statically (6.2),

- relative intrinsic error,
 - over-range,
 - detection of neutrons;
- c) creating a uniform functionality test for all environmental, electromagnetic and mechanical tests and a requirement for the coefficient of variation of each nominal mean reading;
- d) reference to IEC 62706 for the environmental, electromagnetic and mechanical test conditions.

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

FDIS	Report on voting
45B/881/FDIS	45B/888/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.

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

INTRODUCTION

Illicit and inadvertent movement of radioactive materials has become a problem of increasing importance. Radioactive sources out of regulatory control, so-called “orphan sources”, have frequently caused serious radiation exposures and widespread contamination. Although illicit trafficking in nuclear and other radioactive materials is not a new phenomenon, concern about a nuclear “black market” has increased in the last few years, particularly in view of its terrorist potential.

In response to the technical policy of the International Atomic Energy Agency (IAEA), the World Customs Organization (WCO) and the International Criminal Police Organization (Interpol) related to the detection and identification of special nuclear materials and security trends, nuclear instrumentation companies are developing and manufacturing radiation instrumentation to assist in the detection of illicit movement of radioactive and special nuclear materials. This type of instrumentation is widely used for security purposes at nuclear facilities, border control checkpoints, and international seaports and airports.

However, to ensure that measurement results made at different locations are consistent, it is imperative that radiation instrumentation be designed to rigorous specifications based upon agreed performance requirements stated in international standards. Several IEC standards have been developed to address body-worn, hand-held and portal instruments, see Table 1.

Table 1 – IEC standards concerning instruments for the detection of illicit trafficking of radioactive material

Type of instrumentation	IEC number	Title of the standard
Body-worn	62401	Radiation protection instrumentation – Alarming Personal Radiation Devices (PRDs) for the detection of illicit trafficking of radioactive material
	62618	Radiation protection instrumentation – Spectroscopy-Based Alarming Personal Radiation Devices (SPRD) for detection of illicit trafficking of radioactive material
	62694	Radiation protection instrumentation – Backpack-type radiation detector (BRD) for detection of illicit trafficking of radioactive material
Portable or hand-held	62327	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
	62533	Radiation protection instrumentation – Highly sensitive hand-held instruments for photon detection of radioactive material
	62534	Radiation protection instrumentation – Highly sensitive hand-held instruments for neutron detection of radioactive material
Portal	62244	Radiation protection instrumentation – Installed radiation portal monitors (RPMs) for the detection of illicit trafficking of radioactive and nuclear materials
	62484	Radiation protection instrumentation – Spectroscopy-based portal monitors used for the detection and identification of illicit trafficking of radioactive material
Data format	62755	Radiation protection instrumentation – Data format for radiation instruments used in the detection of illicit trafficking of radioactive materials