ICS 13.280 SLOVENSKÁ TECHNICKÁ NORMA Máj 2020

STN	**Prístroje na ochranu pred žiarením Poplachové osobné prístroje na detekciu žiarenia (PRD) určené na detekciu nelegálne prevážaných rádioaktívnych látok**	**STN EN IEC 62401** 35 6607

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

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/20

Obsahuje: EN IEC 62401:2019, IEC 62401:2017

130688

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62401

October 2019

ICS 13.280

English Version

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.

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.

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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

Ref. No. 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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Endorsement notice

The text of the International Standard IEC 62401:2017 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 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.

Publication	Year	Title	EN/HD	Year
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		-

IEC 62401

Edition 2.0 2017-12

INTERNATIONAL STANDARD

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

IEC 62401:2017-12(en)

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INTERNATIONAL STANDARD

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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.

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

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

1 Scope

This document applies to alarming radiation detection instruments that are pocket-sized, carried on the body and used to detect and indicate the presence and general magnitude of gamma radiation fields. Neutron detection may also be provided.

Personal Radiation Devices (PRDs) alert the user to the presence of a source of radiation that is distinctly above the measured average local background radiation level. They are not intended to provide a measurement of the ambient or personal dose equivalent rate.

The object of this document is to describe design and functional criteria along with testing methods for evaluating the performance of the PRDs used for detection of illicit trafficking of radioactive material (e. g., for border radiation monitoring).

This document does not apply to the ambient or personal dose equivalent rate meters which are covered in IEC 60846-1 or IEC 61526, respectively. If the manufacturer states that the PRD can be used for radiation protection purposes, compliance with IEC 60846-1 or IEC 61526 will be needed.

2 Normative references

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.

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*

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*