



BSI Standards Publication

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

National foreword

This British Standard is the UK implementation of EN 62327:2011. It was derived by CENELEC from IEC 62327:2006.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by **[C]** **[C]** tags.

The UK participation in its preparation was entrusted to Technical Committee NCE/2, Radiation protection and measurement.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Amd. No.	Date	Text affected
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**Radiation protection instrumentation -
Hand-held instruments for the detection and identification of
radionuclides and for the indication of ambient dose equivalent rate from
photon radiation
(IEC 62327:2006, modified)**

Instrumentation pour la radioprotection -
Instruments portables pour la détection et
l'identification des radionucléides et pour
l'indication du débit d'équivalent de dose
ambiant pour le rayonnement de photons
(CEI 62327:2006, modifiée)

Strahlenschutz-Messgeräte -
Handgeräte für den Nachweis und die
Identifizierung von Radionukliden und die
Anzeige der durch Gammastrahlung
erzeugten Umgebungs-
Äquivalentdosisleistung
(IEC 62327:2006, modifiziert)

This European Standard was approved by CENELEC on 2011-06-27. 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 Central Secretariat or to any CENELEC member.

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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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

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Foreword

The text of the International Standard IEC 62327:2006, prepared by SC 45B, “Radiation protection instrumentation”, of IEC TC 45, “Nuclear instrumentation”, together with the common modifications prepared by the Technical Committee CENELEC TC 45B, Radiation protection instrumentation, was submitted to the CENELEC formal vote and was approved by CENELEC as EN 62327 on 2011-06-27.

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

The following dates were fixed:

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|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2012-06-27 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2014-06-27 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62327:2006 was approved by CENELEC as a European Standard with agreed common modifications as given below.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-393	2003	International Electrotechnology Vocabulary - Part 393: Nuclear instrumentation - Physical phenomena and basic concepts	-	-
IEC 60050-394	1995	International Electrotechnical Vocabulary -	-	-
+ A1	1996	Chapter 394: Nuclear instrumentation:	-	-
+ A2	2000	Instruments	-	-
IEC 60529	1989	Degrees of protection provided by enclosures	EN 60529	1991
+ A1	1999	(IP Code)	+ corr. May + A1	1993 2000
IEC 60846 (mod)	2002	Radiation protection instrumentation - Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation	EN 60846	2004
IEC 61187 (mod)	1993	Electrical and electronic measuring equipment - Documentation	EN 61187 + corr. March	1994 1995
ISO 4037-1	1996	X and gamma reference radiation for calibrating-dosemeters and doserate meters and for determining their response as a function of photon energy - Part 1: Radiation characteristics and production methods	-	-
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 22188	2004	Monitoring for inadvertent movement and illicit trafficking of radioactive material	-	-
International Bureau of Weights and Measures	1998	The international System of Units (SI)	-	-

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INTRODUCTION

Illicit and inadvertent movement of radioactive materials in the form of radiation sources and contaminated metallurgical scrap have become a problem of increasing importance. Radioactive sources out of regulatory control, so-called “orphan sources”, have frequently caused serious radiation exposures and wide spread 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 posts, 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 this International Standard.

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

1 Scope and object

This International Standard applies to hand-held instruments used for the detection and identification of radionuclides, the detection of neutron radiation and the indication of the ambient dose equivalent rate from photon radiation. This standard does not apply to the performance of radiation protection instrumentation which is covered in IEC 60846.

It is recognized that front line law-enforcement officers, who are generally not radiation experts, may use instruments covered by this standard. This requires user-friendly instrument design and operation with a high degree of inherent safety.

This standard specifies requirements for hand-held photon spectrometers, in particular for the detectors, the electronic multi-channel analyzers, the identification software, the radionuclide libraries, and the instrument display. It further specifies general characteristics, general test procedures, radiation characteristics, as well as electrical, mechanical, safety, and environmental characteristics.

This standard provides guidelines for selecting suitable radionuclide libraries covering radioactive materials that have been most frequently detected at border crossings.

This standard refers to instrumentation which may be used for the purposes described in ISO 22188.

This standard may be used for instruments that do not have neutron response capabilities, in which case, neutron response requirements do not apply.  In which case it shall be clearly identified that the instrument is for the measurement of photon radiation only. 

This standard does not cover laboratory type, high-resolution photon spectrometers.

 Conformation with the requirements of this standard does not guarantee that a radionuclide will always be detected. 

2 Normative references

The following referenced documents are  relevant to  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*