



NSAI
Standards

Irish Standard
I.S. EN 62533:2016

Radiation protection instrumentation - Highly sensitive hand-held instruments for photon detection of radioactive material

I.S. EN 62533:2016

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 62533:2016 is the adopted Irish version of the European Document EN 62533:2016, Radiation protection instrumentation - Highly sensitive hand-held instruments for photon detection of radioactive material

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In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

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EUROPEAN STANDARD

EN 62533

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2016

ICS 13.280

English Version

**Radiation protection instrumentation - Highly sensitive hand-held
instruments for photon detection of radioactive material
(IEC 62533:2010 , modified)**

Instrumentation pour la radioprotection - Instruments
portables de haute sensibilité pour la détection photonique
de matières radioactives
(IEC 62533:2010 , modifiée)

Strahlenschutz-Messgeräte - Hochempfindliche Handgeräte
zur Detektion von Photonenstrahlung emittierendem
radioaktivem Material
(IEC 62533:2010 , modifiziert)

This European Standard was approved by CENELEC on 2015-12-28. 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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

This document (EN 62533:2016) consists of the text of IEC 62533:2010 prepared by SC 45B "Radiation protection instrumentation" of IEC/TC 45 "Nuclear instrumentation", together with the common modifications prepared by CLC/TC 45B "Radiation protection instrumentation".

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) 2016-12-28
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The text of the International Standard IEC 62533:2010 was approved by CENELEC as a European Standard with agreed common modifications.

COMMON MODIFICATIONS

Modification to 8.6.3.2 Test method

Add the following after the first paragraph:

Instead of Cs-137, an alternate source (e.g. Ba-133 or NORM) may be used in case the required activity of Cs-137 cannot be transported to or handled at the site of RF measurement due to legal national restrictions.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When 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 60050-393	2003	International Electrotechnical Vocabulary - Part 393: Nuclear instrumentation - Physical phenomena and basic concepts	-	-
IEC 60050-394	2007	International Electrotechnical Vocabulary - Part 394: Nuclear instrumentation - Instruments, systems, equipment and detectors	-	-
IEC 60068-2-75	1997	Environmental testing - Part 2-75: Tests - Test Eh: Hammer tests	EN 60068-2-75	1997
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
-	-	-	+ corrigendum May	1993
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	2008	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2009
ISO 4037-1	1996	X and gamma reference radiation for calibrating dosimeters and doserate meters and for determining their response as a function of photon energy - Part 1: Radiation characteristics and production methods	-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 4037-2	1997	X and gamma reference radiation for calibrating dosimeters and doserate meters and for determining their response as a function of photon energy - Part 2: Dosimetry for radiation protection over the energy ranges from 8 keV to 1,3 MeV and 4 MeV to 9 MeV	-	-
ISO 4037-3	1999	X and gamma reference radiation for calibrating dosimeters and doserate meters and for determining their response as a function of photon energy - Part 3: Calibration of area and personal dosimeters and the measurement of their response as a function of energy and angle of incidence	-	-

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IEC 62533

Edition 1.0 2010-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Radiation protection instrumentation – Highly sensitive hand-held instruments
for photon detection of radioactive material**

**Instrumentation pour la radioprotection – Instruments portables de haute
sensibilité pour la détection photonique de matières radioactives**





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IEC 62533

Edition 1.0 2010-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Radiation protection instrumentation – Highly sensitive hand-held instruments
for photon detection of radioactive material**

**Instrumentation pour la radioprotection – Instruments portables de haute
sensibilité pour la détection photonique de matières radioactives**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RADIATION PROTECTION INSTRUMENTATION –
HIGHLY SENSITIVE HAND-HELD INSTRUMENTS
FOR PHOTON DETECTION OF RADIOACTIVE MATERIAL**

FOREWORD

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International Standard IEC 62533 has been prepared by subcommittee 45B: Radiation protection instrumentation, of IEC technical committee 45: Nuclear instrumentation.

The text of this standard is based on the following documents:

FDIS	Report on voting
45B/640/FDIS	45B/654/RVD

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

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

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

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

RADIATION PROTECTION INSTRUMENTATION – HIGHLY SENSITIVE HAND-HELD INSTRUMENTS FOR PHOTON DETECTION OF RADIOACTIVE MATERIAL

1 Scope and object

This International Standard applies to hand-held instruments used for the detection and localization of radioactive photon emitting materials. These instruments are highly sensitive meaning that they are designed to detect slight variations in the range of usual photon background caused mainly by illicit trafficking or inadvertent movement of radioactive material. Compared to pocket devices (see IEC 62401), this highly sensitive instrument allows the scanning of larger volume items such as vehicles or containers. They may also be used in fixed or temporarily fixed unattended mode to monitor check points or critical areas.

These instruments also provide an indication of the ambient dose equivalent rate from photon radiation. However, this standard does not apply to the performance of radiation protection instrumentation which is covered in IEC 60846-1 and IEC 61526.

These instruments may provide additional functions as described below without including all features of specialized portable identification devices as defined by IEC 62327:

- rejecting natural background variation encountered when used in movement;
- sorting alarms of interest from naturally occurring radioactive material (NORM) or medical radionuclides originated alarms;
- provide source categorization data (including limited photon spectra) to a remote location.

The object of this standard is to establish performance requirements including physical characteristics, general test conditions, radiation characteristics, electrical safety, and environmental conditions. This standard provides examples of acceptable test methods to determine if an instrument meets the requirements of this standard. The results of tests performed provide information to users on the capability of radiation detection instruments for reliably detecting photon sources.

Obtaining operating performance that meets or exceeds the specifications as stated in this standard depends upon properly establishing appropriate operating parameters, maintaining calibration, implementing a suitable response testing and maintenance program, providing proper training for operating personnel and developing operating procedures that address the instrument limitations and capabilities.

2 Normative references

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.

IEC 60050-393:2003, *International Electrotechnical Vocabulary (IEV) – Part 393: Nuclear instrumentation – Physical phenomena and basic concepts*

IEC 60050-394:2007, *International Electrotechnical Vocabulary (IEV) – Part 394: Nuclear Instrumentation – Instruments, systems, equipment and detectors*

IEC 60068-2-75:1997, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

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