

BS EN 62080:2009+A2:2015



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Sound signalling devices for household and similar purposes

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National foreword

This British Standard is the UK implementation of EN 62080:2009+A2:2015. It is identical to IEC 62080:2001, incorporating amendment 1:2008 and amendment 2:2015. It supersedes BS EN 62080:2009, which will be withdrawn on 22 May 2018.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee PEL/23, Electrical accessories.

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

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

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Amendments/corrigenda issued since publication

Date	Text affected
31 December 2015	Implementation of IEC amendment 2:2015 with CENELEC endorsement A2:2015

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 62080:2009+A2

September 2015

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English version

Sound signalling devices for household and similar purposes
(IEC 62080:2001 + A1:2008)

Dispositifs de signalisation sonore
pour usage domestique et analogue
(CEI 62080:2001 + A1:2008)

Akustische Signalgeber für den Haushalt
und ähnliche Zwecke
(IEC 62080:2001 + A1:2008)

This European Standard was approved by CENELEC on 2009-10-01. 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.

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 Central Secretariat has the same status as the official versions.

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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 62080:2001 and its amendment 1:2008, prepared by IEC TC 23 Electrical accessories, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 62080 on 2009-10-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2010-10-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2012-10-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62080:2001 + A1:2008 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A2

The text of document 23/705/FDIS, future edition 1 of IEC 62080:2009/A2, prepared by IEC/TC 23 "Electrical accessories" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62080:2009/A2:2015.

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publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2018-05-22
standards conflicting with the
document have to be withdrawn

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

Endorsement notice

The text of the International Standard IEC 62080:2009/A2:2015 was approved by CENELEC as a European Standard without any modification.

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 60065 (mod)	1998	Audio, video and similar electronic apparatus - Safety requirements	EN 60065	1998 ¹⁾
IEC 60068-2-32	1975	Environmental testing - Part 2: Tests - Test Ed: Free fall	EN 60068-2-32	1993 ²⁾
IEC 60068-2-75	1997	Environmental testing - Part 2-75: Tests - Test Eh: Hammer tests	EN 60068-2-75	1997
IEC 60083	1997	Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC	-	-
IEC 60085	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990 ³⁾
IEC 60112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980 ⁴⁾
IEC 60127	series	Miniature fuses	EN 60127	series
IEC 60212	1971	Standard conditions for use prior to and during the testing of solid electrical insulating materials	HD 437 S1	1984
IEC 60216	series	Electrical insulating materials - Thermal endurance properties	EN 60216	series
IEC 60227	series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V	- ⁵⁾	-
IEC 60245	series	Rubber insulated cables - Rated voltages up to and including 450/750 V	- ⁶⁾	-
IEC 60317	series	Specifications for particular types of winding wires	EN 60317	series
IEC 60320	series	Appliance couplers for household and similar general purposes	EN 60320	series

¹⁾ EN 60065 is superseded by EN 60065:2002, which is based on IEC 60065:2001, mod.

²⁾ EN 60068-2-32 is superseded by EN 60068-2-31:2008, which is based on IEC 60068-2-31:2008.

³⁾ HD 566 S1 was superseded by EN 60085:2004, which is itself superseded by EN 60085:2008, based on IEC 60085:2007.

⁴⁾ HD 214 S1 is superseded by EN 60112:2003, which is based on IEC 60112:2003.

⁵⁾ The HD 21 series, which is related to, but not directly equivalent with the IEC 60227 series, applies instead.

⁶⁾ The HD 22 series, *Cables of rated voltages up to and including 450/750 V and having cross-linked insulation*, which is related to, but not directly equivalent with the IEC 60245 series, applies instead.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60384-14	1993 ⁷⁾	Fixed capacitors for use in electronic equipment - Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains	-	-
IEC 60417	database	Graphical symbols for use on equipment	-	-
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 60664-1	1992	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2003 ⁸⁾
IEC 60664-3	- ⁹⁾	Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	2003 ¹⁰⁾
IEC 60670 (mod)	series	Boxes and enclosures for electrical accessories for household and similar fixed electrical installations	EN 60670	series
IEC 60695-2-1	all sheets	Fire hazard testing - Part 2: Test methods - Section 1: Glow-wire test methods	EN 60695-2-1 ¹¹⁾	all sheets
IEC 60730 (mod)	series	Automatic electrical controls for household and similar use	EN 60730	series
IEC 60998 (mod)	series	Connecting devices for low voltage circuits for household and similar purposes	EN 60998	series
IEC 61000-2-2	1990 ¹²⁾	Electromagnetic compatibility (EMC) - Part 2: Environment - Section 2: Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems	-	-
IEC 61000-3-2 (mod)	2000	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)	EN 61000-3-2	2000 ¹³⁾
IEC 61000-3-3	1994	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A	EN 61000-3-3 + corr. July	1995 ¹⁴⁾ 1997
IEC 61000-4-2	1995	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	1995 ¹⁵⁾

⁷⁾ IEC 60384-14 is superseded by IEC 60384-14:2005, which is harmonized as EN 60384-14:2005.

⁸⁾ EN 60664-1 is superseded by EN 60664-1:2007, which is based on IEC 60664-1:2007.

⁹⁾ Undated reference.

¹⁰⁾ Valid edition at date of issue.

¹¹⁾ EN 60695-2-1/0 to 1/3 are superseded by EN 60695-2-10:2001 to EN 60695-2-13:2001, which are based on IEC 60695-2-10:2000 to IEC 60695-2-13:2000.

¹²⁾ IEC 61000-2-2 is superseded by IEC 61000-2-2:2002, which is harmonized as EN 61000-2-2:2002.

¹³⁾ EN 61000-3-2 is superseded by EN 61000-3-2:2006, which is based on IEC 61000-3-2:2005.

¹⁴⁾ EN 61000-3-3 is superseded by EN 61000-3-3:2008, which is based on IEC 61000-3-3:2008.

¹⁵⁾ EN 61000-4-2 is superseded by EN 61000-4-2:2009, which is based on IEC 61000-4-2:2008.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-3 (mod)	1995	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	1996 ¹⁶⁾
IEC 61000-4-4	1995	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	1995 ¹⁷⁾
IEC 61000-4-5 + corr. October	1995 1995	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995 ¹⁸⁾
IEC 61000-4-6	1996	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	1996 ¹⁹⁾
IEC 61000-4-11	1994	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11	1994 ²⁰⁾
IEC 61558-1 (mod)	1997	Safety of power transformers, power supply units and similar - Part 1: General requirements and tests	EN 61558-1 + A11	1997 ²¹⁾ 2003
CISPR 14	series	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus	EN 55014	series
ISO 1456	1988 ²²⁾	Metallic coatings - Electrodeposited coatings of nickel plus chromium and of copper plus nickel plus chromium	-	-
ISO 2081	1986 ²³⁾	Metallic coatings - Electroplated coatings of zinc on iron or steel	-	-
ISO 2093	1986	Electroplated coatings of tin - Specification and test methods	-	-

¹⁶⁾ EN 61000-4-3 is superseded by EN 61000-4-3:2002, which is based on IEC 61000-4-3:2002.

¹⁷⁾ EN 61000-4-4 is superseded by EN 61000-4-4:2004, which is based on IEC 61000-4-4:2004.

¹⁸⁾ EN 61000-4-5 is superseded by EN 61000-4-5:2006, which is based on IEC 61000-4-5:2005.

¹⁹⁾ EN 61000-4-6 was superseded by EN 61000-4-6:2007, which is itself superseded by EN 61000-4-6:2009, based on IEC 61000-4-6:2008.

²⁰⁾ EN 61000-4-11 is superseded by EN 61000-4-11:2004, which is based on IEC 61000-4-11:2004.

²¹⁾ EN 61558-1 is superseded by EN 61558-1:2005, which is based on IEC 61558-1:2005.

²²⁾ ISO 1456:1988 is superseded by ISO 1456:2009, which is harmonized as EN ISO 1456:2009.

²³⁾ ISO 2081:1986 is superseded by ISO 2081:2008, which is harmonized as EN ISO 2081:2008.

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SOUND SIGNALLING DEVICES FOR HOUSEHOLD AND SIMILAR PURPOSES

1 Scope

 This International Standard applies to **sound signalling devices** with integral enclosures or to **sound signalling devices** intended to be fitted into or supplied with enclosures according to IEC 60670 intended for household and similar purposes with **rated voltages** not exceeding 250 V a.c. or 250 V d.c. and with rated power inputs not exceeding 100 VA. In these **sound signalling devices** an indicating light having a rated input power not exceeding 10 VA may also be incorporated. 

These products are designated as "devices" throughout the remainder of the text.

This standard applies to **fixed**, **portable** and **plug-in devices** for indoor or outdoor use.

In locations where special conditions prevail, special constructions may be required.

NOTE 1 This standard or parts of it may be used as a guide for **sound signalling devices** having a voltage less than 50 V a.c. or 75 V d.c. Additional requirements for **sound signalling devices** having a voltage less than 50 V a.c. or 75 V d.c. are under consideration.

NOTE 2 This standard does not cover the radio transmitting or receiving functions.

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 60065:1998, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60068-2-32:1975, *Environmental testing – Part 2: Tests. Test Ed: Free fall (Procedure 1)*

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

IEC 60083:1997, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

IEC 60085:1984, *Thermal evaluation and classification of electrical insulation*

IEC 60112:1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 60127 (all parts), *Miniature fuses*

IEC 60212:1971, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

IEC 60216 (all parts), *Guide for the determination of thermal endurance properties of electrical insulating materials*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750 V*

- IEC 60317 (all parts), *Specifications for particular types of winding wires*
- IEC 60320 (all parts), *Appliance couplers for household and similar general purposes*
- IEC 60384-14:1993, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*
- IEC 60417 (all parts), *Graphical symbols for use on equipment*
- IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
- IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*
- IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coatings to achieve insulation coordination of printed board assemblies*
- IEC 60670, *General requirements for enclosures for accessories for household and similar fixed-electrical installations*
- IEC 60695-2-1 (all sheets) *Fire hazard testing – Part 2: Test methods – Section 1: Glow-wire test and guidance*
- IEC 60730 (all parts), *Automatic electrical controls for household and similar use*
- IEC 60998 (all parts), *Connecting devices for low-voltage circuits for household and similar purposes*
- IEC 61000-2-2:1990, *Electromagnetic compatibility (EMC) – Part 2: Environment – Section 2: Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems*
- IEC 61000-3-2:2000, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*
- IEC 61000-3-3:1994, *Electromagnetic compatibility (EMC) – Part 3: Limits – Section 3: Limitation of voltage fluctuation and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A*
- IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test. Basic EMC Publication*
- IEC 61000-4-3:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency, electromagnetic field immunity test*
- IEC 61000-4-4:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test. Basic EMC Publication*
- IEC 61000-4-5:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 5: Surge immunity test*
- IEC 61000-4-6:1996, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 6: Immunity to conducted disturbances, induced by radio-frequency fields*
- IEC 61000-4-11:1994, *Electromagnetic compatibility (EMC) – Part 4: Testing and measuring techniques – Section 11: Voltage dips, short interruptions and voltage variations immunity tests*
- IEC 61558-1:1997, *Safety of power transformers, power supply units and similar – Part 1: General requirements and tests*

CISPR 14 (all parts), *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus*

ISO 1456:1988, *Metallic coatings – Electrodeposited coatings of nickel plus chromium and of copper plus nickel plus chromium*

ISO 2081:1986, *Metallic coatings – Electroplated coatings of zinc on iron or steel*

ISO 2093:1986, *Electroplated coatings of tin – Specification and test methods*

3 Definitions

For the purpose of this International Standard, the following definitions apply.

NOTE Where the terms “voltage” and “current” are used, they imply r.m.s. values unless otherwise specified.

3.1

sound signalling device

electromechanical or electronic device which emits an audible sound when activated

NOTE The activation may be produced by manual or automatic means, and where transmission or the activation signal may be through conductors or by radio or any other transmission means.

3.2

type D device

device where the sound output continues in proportion to the duration of operation of the control

3.3

type R device

3.3.1

type R1 device

device where the first sound note is created by the initial operation of the control and a second note is created on the release of the control

3.3.2

type R2 device

device where the sound output is created by the initial operation of the control and where the period of sound output continues for the designed duration irrespective of the condition of the control

3.4

enclosure

part providing protection of equipment against certain external influences, and in any direction, protection against direct contact

[3.1 of IEC 60529]

3.5

fixed device

device which is intended to be permanently connected to a power supply, and to be used when fastened to a support

NOTE A support may be a permanent part of a building, an appliance, etc.

3.6

portable device

device intended to be connected to, or integral with, flexible cable(s), and which can easily be moved from one place to another while connected to the power supply

3.7

plug-in device

device provided with plug pins and which relies upon insertion into a socket-outlet for its power supply

3.8

intermittent operation

sequence of cycles of operation with a specified ON period and specified OFF period

3.9

continuous operation

operation for an unlimited period

3.10

rated voltage

voltage assigned to the device by the manufacturer

3.11

rated voltage range

range of voltages assigned to the device by the manufacturer, expressed by its upper and lower limits

3.12

ELV (extra low voltage)

voltage supplied from a source within the device which does not exceed 50 V a.c. or 120 V ripple free d.c. between conductors or between conductors or earth when the device is supplied at **rated voltage**

3.13

SELV (safety extra-low voltage)

voltage not exceeding 50 V a.c. or 120 V ripple free d.c. between conductors or between conductors or earth in a circuit which is isolated from the supply by means such as a safety isolating transformer

NOTE 1 Maximum voltages lower than 50 V a.c. or 120 V ripple free d.c. may be specified in particular situations especially when direct contact with live parts is allowed.

NOTE 2 The voltage limit should not be exceeded at any load between full load and no load when the source is a safety isolating transformer.

NOTE 3 "Ripple free" is an r.m.s ripple voltage of not more than 10 % of the d.c. component.

3.14

rated power input

power input under normal conditions at normal operating temperature assigned to the device by the manufacturer

3.15

rated current

current assigned to the device by the manufacturer

3.16

rated frequency

frequency assigned to the device by the manufacturer

3.17

rated frequency range

range of frequencies assigned to the device by the manufacturer, expressed by its upper and lower limits

3.18

normal use

use of the device for the purpose for which it was made and/or declared by the manufacturer

3.19

terminal

conductive part of one pole comprising one or more clamping units and insulation if necessary

[3.5 of IEC 60998-1]

3.20

screw-type terminal

terminal for the connection of two or more conductors by means of screw-type clamping units

[3.101 of IEC 60998-2-1]

3.21

pillar terminal

terminal in which the conductors are inserted into a hole or cavity, where they are clamped under the shank of a screw or screws

NOTE The clamping pressure may be applied directly by the shank of the screw or through an intermediate part to which pressure is applied by the shank of the screw.

[3.101.1 of IEC 60998-2-1]

3.22

screw terminal

terminal in which the conductors are clamped under the head of one or more screws

NOTE The clamping pressure may be applied directly by the head of a screw or through an intermediate part, such as a washer, a clamping plate or an anti-spread device.

[3.101.2 of IEC 60998-2-1]

3.23

thread-forming screw

tapping screw having an uninterrupted thread, which by screwing in, forms a thread by displacing material

NOTE An example is shown in figure 1a.

3.24

thread-cutting screw

tapping screw having an interrupted thread, which by screwing in, forms a thread by removing material.

NOTE An example is shown in figure 1b.

3.25

mantle terminal

terminal in which the conductors are clamped against the base of a slot in a threaded stud by means of a nut, by a suitably shaped washer placed under the nut, by a central peg if the nut is a cap nut, or by an equally effective means for transmitting the pressure from the nut to the conductors within the slot

[3.101.5 of IEC 60998-2-1]

3.26

screwless terminal

connecting device for the connection and subsequent disconnection of a rigid (solid or stranded) or flexible conductor or the interconnection of two conductors capable of being dismantled the connection being made directly or indirectly, by means of springs, parts of angled eccentric or conical form, etc., without special preparation of the conductor concerned other than removal of insulation

3.27

base

part of the device retaining current-carrying parts and, in general, the mechanism in position

3.28

creepage distance

shortest distance along the surface of the insulating material between two conductive parts

3.29

clearance

shortest distance in air between two conductive parts

3.30

accessible parts or surfaces

parts which can be touched by means of the standard test finger shown in figure 2

3.31

basic insulation

insulation applied to live parts to provide basic protection against electric shock

NOTE **Basic insulation** does not necessarily include insulation used exclusively for functional purposes.

3.32

supplementary insulation

independent insulation applied in addition to the **basic insulation** in order to provide protection against electric shock in the event of a failure of the **basic insulation**

3.33

double insulation

insulation comprising both **basic insulation** and **supplementary insulation**

3.34

reinforced insulation

single insulation system applied to live parts which provides a degree of protection against electric shock equivalent to **double insulation**

NOTE The term "insulation system" does not imply that the insulation should be one homogeneous piece. It may comprise several layers which cannot be tested singly as **supplementary** or **basic insulation**.

3.35

earth protected device

device in which protection against electric shock does not rely on **basic insulation** only but which includes an additional safety precaution such as exposed conductive parts connected to the protective earthing conductor in the fixed wiring of the installation in such a way that exposed conductive parts cannot become live in the event of a failure of the **basic insulation**

NOTE This provision includes a protective conductor in the supply cable. 

3.36

additive insulation protected device

device in which protection against electric shock does not rely on **basic insulation** only, but in which additional safety precautions such as **double insulation** or **reinforced insulation** are provided, there being no provision for protective earthing or reliance upon installation conditions

3.37

installation protected device

device in which the protection against electric shock does not rely on **basic insulation** only, but in which additional safety precautions are provided during the installation according to the installation rules

NOTE This definition is in accordance with 7.2.3 of IEC 61140. 

3.38

rated operating time

time during which the device is operating

3.39

temperature-limiting device

device which during abnormal operation limits the temperature of the controlled part by automatically opening the circuit or by reducing the current and which is constructed so that its setting cannot be altered by the user

3.40

type X rewirable attachment

method of attachment of the supply flexible cable such that it can easily be rewired

NOTE 1 The supply flexible cable may be specially prepared and only available from the manufacturer or its service agents.

NOTE 2 A specially prepared flexible cable may also include a part of the device.

3.41

type Z non-rewirable attachment

method of attachment of the supply flexible cable such that it cannot be replaced without breaking or destroying a part of the device

4 General requirements

Devices and **enclosures** shall be so designed and constructed that, in **normal use**, they are reliable and operate without danger to the user or the surroundings.

Compliance is checked by fulfilling all the requirements and tests specified.

5 General notes on tests

5.1 The tests according to this standard are type tests.

5.2 Unless otherwise specified, the tests shall be carried out on a single specimen as delivered under normal conditions of use, which shall satisfy all the tests applicable to the device.

If the device is intended for several supply voltages, for both a.c. and d.c., more than one specimen may be required.

NOTE If it is necessary to dismantle a device for certain tests, an additional specimen is necessary.

The test on constituent parts may require the provision of additional specimens of these parts. If it is necessary to submit such specimens, they shall be presented at the same time as the device.

5.3 Unless otherwise specified, the tests shall be carried out in the order of the clauses. Before starting the tests, the device shall be supplied at **rated voltage** to verify that it is in operating condition.

5.4 The tests shall be carried out with the device or any removable parts placed in the most unfavourable position which can occur in **normal use**.

5.5 Unless otherwise specified, the tests are carried out at an ambient temperature between 15 °C and 35 °C. In case of doubt, the tests are made at an ambient temperature of 20 °C ± 5 °C.

5.6 Devices for a.c. only shall be tested with a.c. at the **rated frequency**, if marked, and those for a.c. and d.c. shall be tested at the more unfavourable supply.

Devices for a.c. which are not marked with a frequency range of 50 Hz to 60 Hz shall be tested with either 50 Hz or 60 Hz, whichever is the more unfavourable.

Devices carrying an indication of the range of rated frequencies other than 50 Hz to 60 Hz shall be tested at the most unfavourable frequency of the **rated frequency range**.

5.7 Devices designed for more than one **rated voltage** shall be tested on the basis of the most unfavourable voltage as declared by the manufacturer.

5.8 Devices provided with adjustment means shall be tested with the adjustment set to the most unfavourable position if the adjustment can be modified by the user.

Appropriate sealing is considered not to allow any modification of the adjustment means by the user.

5.9 Devices are tested installed according to the manufacturer's instructions:

- flush type devices are tested mounted in their appropriate **enclosures**;
- surface mounted devices are tested mounted as intended for **normal use**;
- **portable devices** intended to be supplied by means of a flexible supply cable are tested with the appropriate cable attached to the device;
- **plug-in devices** intended to be inserted into a socket-outlet are tested with the device mounted in an appropriate socket-outlet.

5.10 For devices having characteristics of both type D and type R (see clause 6), the tests shall be carried out for both.

5.11 For devices incorporating electronic circuits, see annex A.

6 Classification

Devices are classified as follows:

6.1 According to the type of sound signal:

- **type D device**;
- **type R1 device**;
- **type R2 device**.

NOTE The three types of devices may be incorporated in a single "**sound signalling device**".

6.2 According to the duration of operation:

- **intermittent operation**;
- **continuous operation**.

6.3 According to the nature of the supply:

- devices for a.c. only;
- devices for d.c. only;
- devices for both a.c. and d.c.

6.4 According to the protection against electric shock:

6.4.1 Additive insulation protected device

NOTE Devices protected by additive insulation, this insulation being integral with the device.

6.4.2 Earth protected device

NOTE The protection is determined partly by the construction and partly by the protective earth.

6.4.3 Installation protected device

NOTE The protection is determined partly by the **enclosure** in which the device is intended to be mounted and partly by the method installation.

6.5 According to the degree of protection against solid foreign objects and harmful ingress of water, to be defined in accordance with IEC 60529 (IP system).

6.6 According to the method of application/mounting:

- fixed surface device;
- fixed flush device;
- **portable device**;
- **plug-in device**.

6.7 According to the method of installation, as a consequence of the design:

- devices where the cover or cover plate can be removed without displacement of the conductors (design A);
- devices where the cover or cover plate cannot be removed without displacement of the conductors (design B).

NOTE If a device has a **base** (main part) which cannot be separated from the cover or cover-plate, and requires a supplementary plate to meet the standard, which can be removed for redecorating the wall without displacement of the conductors, it is considered to be of design A, provided the additional plate meets the requirements specified for covers and cover-plate.

6.8 According to the maximum and minimum ambient temperature of intended use:

- devices without T marking are for ambient temperatures between 0 °C + 35 °C;
- devices with T marking are for ambient temperatures lower than 0 °C or higher than +35 °C;

7 Marking

7.1 Devices shall be marked with at least the following:

- a) **rated voltage** or the **rated voltage range** in volts;
- b) symbol for nature of supply if the **rated frequency** or **rated frequency range** is not marked;
- c) **rated frequency** or **rated frequency range** when relevant;

- d) **rated power input** in volt-amperes or watts if greater than 25 W;
- e) manufacturer's or responsible vendor's name, trade mark or identification mark;
- f) type reference;
- g) symbol for degree of protection IP, only if greater than IP20;

The following marking shall be either placed on the device or provided in the instruction sheet:

- h) T marking, if applicable;
- i) indication of the type (D, R1, R2);
- j) duration of **intermittent operation** for **type D devices** other than devices for **continuous operation**, for example "2/1 min".

Additional information may be given provided the information is not misleading.

7.2 If the device is designed to be suitable for different **rated voltages** or different rated power inputs, it shall be easy to clearly distinguish the voltage or power input to which the device is set.

This requirement is considered as satisfied if the **rated voltage** or rated power input for which the device is intended is placed on a wiring diagram. The wiring diagram may be on the inside face of a cover that has to be removed in order to connect the supply conductors.

7.3 When symbols are used, they shall be as follows:

Ampere	A
Volt	V
Volt-ampere, watt	VA; W
Alternating current (no. 5032 of IEC 60417)	~
Hertz	Hz
Hours	h
Minutes	min
Seconds	s
Direct current (no. 5031 of IEC 60417).....	— — —
Neutral	N
Protective earth (no. 5019 of IEC 60417)	
Degree of protection according to IEC 60529	IPXX
Ambient temperature limits if outside the range from 0 °C to 35 °C.	Y T Z

If a symbol for nature of supply is used, it shall be placed next to the marking for rated voltage.

NOTE 1 The letter "X" should be replaced by the relevant number. An additional letter can be used according to IEC 60529.

NOTE 2 The letter "Y" before the "T" is replaced by the lowest ambient temperature. The letter "Z" after the "T" is replaced by the highest ambient temperature. 

 Examples:

- 10 T 55: means from –10 °C up to +55 °C
- 10 T 35: means from –10 °C up to +35 °C
- 10 T 55: means from +10 °C up to +55 °C
- 0 T 55: means from 0 °C up to +55 °C 

7.4 Terminals provided exclusively for the neutral conductor shall be designated by the letter N.

The protective earth **terminals** shall be designated by the earth symbol number 5019 of IEC 60417.

These indications shall not be placed on screws or any other easily removable parts.

7.5 The adjustment means or similar intended to be set during installation or in **normal use** shall be provided with a mark indicating the direction of increase or decrease of the quantity to be controlled. The symbol number 5004 of IEC 60417 is used.

(+ or – indication is considered as sufficient.)

7.6 For devices fitted with a flexible supply cable, the instructions shall contain the following information:

- for **type X rewirable attachments** having a specially prepared cable:

"If the external flexible cable of this device is damaged, it shall be replaced by a special cable or assembly available from the manufacturer or service agent."

- for **type Z non-rewirable attachments**:

"The supply flexible cable cannot be replaced, if the flexible cable is damaged, the device shall be scrapped."

Compliance with the requirements of 7.1 to 7.6 is checked by inspection.

7.7 Marking shall be easily legible, durable and indelible.

The indications, including wiring diagram, if provided, shall be clearly visible with normal or corrected vision, without additional magnification, marked either on the front of the device or on the inner part of its associated **enclosure**, or on the main part of the device so as to be easily legible on removal of any cover or cover plate which may be present when the device is mounted and wired during installation. These indications shall not be placed on parts which can be removed without the use of a tool.

Compliance is checked by inspection and, if necessary, by the following test:

The test is made by rubbing the marking by hand for 15 s with a piece of cotton cloth soaked with water, and again for 15 s with a piece of cotton cloth soaked in petroleum spirit.

Marking made by impressing, moulding or engraving is not subjected to this test.

After this test, the marking shall be easily legible.

The marking shall also remain legible after all non-destructive tests of the standard.

It shall not be easily possible to remove labels, and they shall not show any signs of curling.

NOTE The petroleum spirit is defined as an aliphatic solvent hexane, with a content of aromatic of maximum 0,1 volume percentage, a kauributanol value of 19, an initial boiling point of approximately 65 °C, a dry point of approximately 69 °C, and a density of approximately 0,68 g/cm³.

8 Protection against electric shock

Devices shall be designed and constructed so that there is adequate protection against electric shock when they are either mounted or installed in accordance with the manufacturer's instructions. This requirement applies after removal of any detachable parts which can be removed without the use of a tool.

The insulating properties of lacquer, enamel, paper, cotton, oxide film on metal parts, beads and filling material which soften in heat shall not be relied upon to provide the required protection against contact with live parts.

Compliance is checked by inspection and by the following test (if applicable):

The specimen is tested either mounted or installed in accordance with the manufacturer's instructions.

The standard test finger shown in figure 2 is applied without appreciable force in every possible position.

Apertures preventing entry of the finger are further tested by means of a straight unjointed test finger of the same dimensions which is applied with a force of 20 N. If this finger enters, the test with the standard finger is repeated, the finger being introduced through the aperture. If the unjointed test finger does not enter, the force is increased to 30 N.

If the protection is displaced or the aperture so distorted that the standard test finger can be introduced without force, the test with the standard test finger is repeated. Any contact is electrically detected.

A1 *In addition, openings in insulating material or unearthed conductive parts are tested by applying the test pin shown in Figure 11 without appreciable force in every possible position. **A1***

It shall not be possible with either the standard test finger or the test pin to touch live parts.

*For **additive insulation protected devices**, it shall not be possible to touch conductive parts which are separated from live parts by **basic insulation** or the **basic insulation** itself.*

In case of doubt, for T rated devices, the previous tests are repeated at the minimum and maximum T rated temperature ± 2 °C.

NOTE A conductive part is not considered to be live if this part is supplied by **SELV**.

9 Constructional requirements

9.1 Devices shall be so constructed as to permit:

- easy introduction and connection of the conductors in the **terminals**;
- adequate space between the underside of the **base** and the surface on which the **base** is mounted or between the sides of the **base** and the **enclosure** (cover or **enclosure**) so that, after installation of the device, the insulation of the conductors is not necessarily pressed against live parts of different polarity or against moving parts.

NOTE 1 This requirement does not imply that the metal parts of the **terminals** are necessarily protected by insulating barriers or insulating shoulders, to avoid contacts, due to incorrect installation of the **terminal** metal parts, with the insulation of the conductor.

NOTE 2 For surface-type devices, mounted on a mounting plate, a wiring channel may be needed to comply with this requirement.

In addition, devices classified as design A shall permit:

- easy fixing of the **base** to a wall or in a **enclosure** and correct positioning of the conductors;
- easy positioning and removal of the cover or cover-plate, without displacing the conductors.

Where the fixing of covers, cover-plates of devices serves to fix the **base**, there shall be means to maintain the **base** in position, even after removal of the covers and cover-plates.

Compliance is checked by inspection and by an installation test with conductors of the largest cross-sectional area as declared by the manufacturer.

9.2 Covers providing protection against electric shock shall be securely fixed.

Compliance is checked according to 9.2.1, 9.2.2 or 9.2.3.

9.2.1 For covers and cover-plates whose fixing is of the screw-type: *by inspection only.*

9.2.2 For covers and cover-plates whose fixing is not dependent on screws and whose removal is obtained by applying a force in a direction approximately perpendicular to the mounting/supporting surface (see table 1):

- when their removal may give access, with the standard test finger, to live parts: *by the test of 15.5;*
- when their removal may give access, with the standard test finger, to non-earthed metal parts separated from live parts in such a way that **creepage distances** and **clearances** have the values specified in clause 23, *by the test of 15.6;*
- when their removal may give access, with the standard test finger, only to:
 - insulating parts, or
 - earthed metal parts, or
 - metal parts separated from live parts in such a way that **creepage distances** and **clearances** have twice the values specified in clause 23 or
 - live parts of **SELV** circuits not greater than 25 V a.c.:
by the test of 15.7.

Table 1 – Force to be applied to covers, cover-plates, or actuating members whose fixing are not dependent on screws

Accessibility with the test finger after removal of covers, cover-plates or parts of them	Test according to	Force to be applied N			
		Devices complying with 15.8 and 15.9		Devices not complying with 15.8 and 15.9	
		Shall not come off	Shall come off	Shall not come off	Shall come off
To live parts	15.5	40	120	80	120
To non-earthed metal parts separated from live parts by creepage distances and clearances according to table 12	15.6	10	120	20	120
To insulating parts, earthed metal parts, live parts of SELV ≤25 V a.c. or metal parts separated from live parts by creepage distances and by clearances twice those according to table 12	15.7	10	120	10	120

9.2.3 For covers and cover-plates whose fixing is not dependent on screws and whose removal is obtained by using a tool in accordance with the manufacturer's instructions given in an instruction sheet or in a catalogue:

by the same tests of 9.2.2, except that the requirements of 15.5.2 are not applicable.

9.3 Ordinary devices shall be so constructed that, when they are fixed and wired as in **normal use**, they shall have at least a degree of protection IP2X.

Compliance is checked by inspection and by an installation test with conductors of the smallest cross sectional area as declared by the manufacturer.

9.4 Devices other than ordinary, when installed according to the manufacturer's instructions, shall have the declared degree of protection against ingress of water (see 13.3) when fitted with screwed conduits or with polyvinyl chloride (PVC) sheathed or similar type of cables.

Surface-type devices other than ordinary shall have provision for opening a drain hole at least 5 mm in diameter, or 20 mm² in area with a width and a length of at least 3 mm.

The drain hole shall be effective in all the mounting positions of the device according to the installation instructions given by the manufacturer. Alternatively, the drain hole shall be effective in at least two positions of the device when it is mounted on a vertical wall, one of these with the conductors entering at the top and the other with the conductors entering at the bottom.

Compliance is checked by inspection, by measurement and by the relevant tests of 13.3.

A drain hole in the back of the enclosure is deemed to be effective only if the design of the enclosure ensures a **clearance** of at least 5 mm from the wall, or provides a drainage channel of at least the size specified.

9.5 Handles, knobs, setting knobs, grips, levers and similar parts shall be fixed in a reliable manner so that they will not work loose in **normal use**, if loosening may result in a hazard.

Compliance is checked by inspection and by the following tests:

*Where it is possible in **normal use**, an axial pull shall be applied for 1 min to try to pull off the actuating member.*

*If the shape of the actuating member is such that an axial pull is likely to be applied in **normal use**, the force is 100 N.*

*If the shape of the actuating member is such that an axial pull is unlikely to be applied in **normal use**, the force is 15 N.*

An axial push of 30 N for 1 min is then applied to all actuating members.

During and after these tests, the device shall show no damage, nor shall an actuating member have moved so as to impair compliance with this standard.

NOTE Sealing compound and the like, other than self-hardening resins are not considered to be adequate to prevent loosening.

9.6 Screws or other means for mounting the device on a surface or in a box or **enclosure** shall not serve any other fixing purpose.

9.7 Combinations of devices with other accessories, comprising separate **bases**, shall be so designed that the correct position of each **base** is ensured.

Compliance with the requirements of 9.6 and 9.7 is checked by inspection.

9.8 Devices to be installed in an enclosure shall be so designed that the conductor ends can be prepared after the enclosure is mounted in position, but before the device is fitted in the enclosure.

In addition, the **base** shall have adequate stability when mounted in the enclosure.

Compliance is checked by inspection and by an installation test with conductors of the largest cross-sectional area as declared by the manufacturer.

9.9 Inlet openings shall allow the introduction of the conduit or the protective covering of the cable so as to afford complete mechanical protection.

Ordinary surface-type devices shall be so constructed that the conduit or protective covering can enter at least 1 mm into the **enclosure**.

In ordinary surface-type devices, the inlet opening for conduit entries, if any, or at least two of them if there are more than one, shall be capable of accepting conduit sizes of 16 or 20.

Compliance is checked by inspection during the test of 9.9 and by measurement.

NOTE Inlet openings of adequate size may also be obtained by the use of knockouts or of suitable insertion pieces.

9.10 Requirements for membranes in inlet openings

9.10.1 Membranes shall be reliably fixed and shall not be displaced by mechanical and thermal stresses occurring in **normal use**. Membranes are tested when assembled in the devices.

Compliance is checked by the following test:

The devices fitted with membranes which have been subjected to the treatment specified in 13.1, are placed for 2 h in a heating cabinet as described in 13.1, the temperature being maintained at 40 °C ± 2 °C.

Immediately after this period, a force of 30 N is applied for 5 s to various parts of the membranes by means of the tip of a straight unjointed test finger of the same dimensions as the standard test finger shown in figure 2.

During these tests, the membranes shall not deform to such an extent that live parts become accessible.

*For membranes likely to be subjected to an axial pull in **normal use**, an axial pull of 30 N is applied for 5 s.*

During this test, the membranes shall not come out.

The test is then repeated with membranes which have not been subjected to any treatment.

9.10.2 It is recommended that membranes be so designed and made of such material that the introduction of the cables into the devices is permitted when the ambient temperature is low.

NOTE In some countries, compliance with this requirement is considered necessary due to installation practices in cold conditions.

Compliance is checked by the following test:

- *the device is fitted with membranes which have not been subjected to any ageing treatment, those without an opening being suitable pierced;*
- *the device is subjected to a temperature of $-15\text{ °C} \pm 2\text{ °C}$ for 2 h;*
- *after this period, while the device is still cold, it shall be possible to introduce, without undue force, cables of the heaviest type, as declared by the manufacturer, through the membranes;*
- *after the tests in 9.10.1 and 9.10.2, the membranes shall show no harmful deformation, cracks or similar damage which would lead to non-compliance with this standard.*

9.11 Devices in which SELV provides the degree of protection against electric shock, shall be designed such that the insulation between the parts supplied at SELV and other live parts satisfy the requirements regarding **double insulation** or **reinforced insulation**.

*Compliance is checked by a test specified for **double insulation** and **reinforced insulation**.*

9.12 Components of devices which provide **supplementary insulation** or **reinforced insulation** and which might be omitted during installation or reassembly shall be:

- either fixed in such a way that they cannot be removed without being seriously damaged;
- or designed in such a manner that they cannot be replaced in an incorrect position and that, if they are omitted, the device cannot operate or is clearly incomplete.

However, a sleeve may be used as **supplementary insulation** on internal conductors if it is held in place by effective means.

A sleeve is considered as effectively secured if it can be removed only by breaking it or cutting it or if it is secured at both ends.

Compliance is checked by inspection and by a manual test.

9.13 Inside the device, the sheath of a flexible cable shall be used as **supplementary insulation** only at a point where it is not subjected to excessive thermal or mechanical stresses and if its insulating properties are not less than those specified for flexible cable sheaths in IEC 60227 or IEC 60245, appropriate to the type of cable fitted by the manufacturer.

9.14 All devices shall be designed such that the **creepage distances** and **clearances** over **supplementary insulation** or **reinforced insulation** cannot be reduced by wear below the values specified in clause 23. They shall be designed in such a way that, if wires, screws, nuts, washers, springs or similar parts become loose or detached, they cannot, in **normal use**, reach a position where the **creepage distance** or **clearance** over **supplementary insulation** or **reinforced insulation** is reduced to less than 50 % of the value specified in clause 23.

Compliance is checked by inspection, by measurements and by a manual test.

In application of this requirement:

- *it is accepted that two independent fixings do not become detached simultaneously;*
- *parts secured by means of screws or nuts and lockwashers are considered as being not liable to become loose providing that it is not necessary to remove these screws or these nuts during replacement of the supply cable;*
- *wires with soldered connections are not considered as being sufficiently secured unless they are maintained in place close to the soldered end independently of the solder;*
- *flexible wires connected to **terminals** are not considered as sufficiently secured unless supplementary fixing is provided close to the **terminal** such that this method of fixing clamps both the insulation and the core at the same time;*
- *rigid conductors are not considered as liable to come out of a **terminal** if they remain in position when the **terminal** screw is loosened.*

9.15 Plug-in devices provided with pins for insertion into socket-outlets shall not impose undue strain on these socket-outlets.

*Compliance is checked by inserting the pins of the device, as in **normal use**, into a socket-outlet with earthing contact. The socket-outlet has a horizontal pivot at a distance of 8 mm behind the engagement face of the socket-outlet and in the plane of the contact tubes.*

The torque which has to be applied to maintain the engagement face of the socket-outlet in the vertical plane shall not exceed 0,25 Nm.

NOTE The torque to be applied to the socket-outlet without the device is not included in this value.

10 Normal operation

The devices shall operate under all normal conditions liable to arise in practice.

Compliance is checked by the following test:

The device shall be at ambient temperature at the start of the test for non T- marked devices. The device shall be t min. or t max. for T- marked devices, whichever produces the most onerous conditions.

The test is carried out under the following conditions:

*The devices are operated at a voltage of 0,94 and 1,06 times **rated voltage**, whichever is the most onerous.*

- *For **type D devices** intended to be operated continuously, by a **continuous operation** of 3 h or until steady state thermal conditions are reached, whichever is the greater.*
- *For **type D devices** intended to be operated intermittently, by 10 cycles of operation. Each cycle shall operate for a minimum ON period of 5 s and a maximum OFF period of 15 s.*
- *For **type R1 devices**, by 10 cycles of operation, each cycle comprising an ON period of 5 s and OFF period of 15 s.*