
**Kabelska omrežja za televizijske in zvokovne signale ter interaktivne storitve –
11. del: Varnost (IEC 60728-11:2005, spremenjen)**

(istoveten EN 60728-11:2005)

Cable networks for television signals, sound signals and interactive services - Part
11: Safety (IEC 60728-11:2005, modified)

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EUROPEAN STANDARD

EN 60728-11

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2005

ICS 33.060.40

Supersedes EN 50083-1:1993 + A1:1997 + A2:1997

English version

**Cable networks for television signals,
sound signals and interactive services**

Part 11: Safety

(IEC 60728-11:2005, modified)

Réseaux de distribution par câbles
pour signaux de télévision, signaux
de radiodiffusion sonore et services
interactifs

Partie 11: Sécurité
(CEI 60728-11:2005, modifiée)

Kabelnetze für Fernsehsignale,
Tonsignale und interaktive Dienste
Teil 11: Sicherheitsanforderungen
(IEC 60728-11:2005, modifiziert)

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This European Standard was approved by CENELEC on 2005-04-01. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of documents 100/847A/FDIS + 100/847B/FDIS, future edition 2 of IEC 60728-11, prepared by Technical Area 5: Cable networks for television signals, sound signals and interactive services, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote.

Together with a common modification, prepared by the Technical Committee CENELEC TC 209, Cable networks for television signals, sound signals and interactive services, it was approved by CENELEC as EN 60728-11 on 2005-04-01.

This European Standard supersedes EN 50083-1:1993 + A1:1997 + A2:1997 + corrigenda Jul. 2000.

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) 2006-01-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2008-04-01

Annexes ZA, ZB and ZC have been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60728-11:2005 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

Contents

Add:

Annex ZA (normative) Special national conditions

Annex ZB (informative) A-deviations

Annex ZC (normative) Normative references to international publications with their corresponding European publications

Annex B

B.1 Justification

Replace by:

B.1 Introduction

A.C. power distribution systems using IT-network technology are equipped with a line-to-line voltage of 230 V (see Figure B.1). Such IT-networks have no N-conductor, and the a.c. mains power is supplied to the equipment from two of the three line conductors (EN 60950-1, Annex V).

For a cable network covering an area with this type of IT power supply network, special initiative should be taken to ensure that the safety in the cable network is maintained. The following equipotential bonding arrangements described will provide necessary safety in such a network.

NOTE See also Annex ZA.

Bibliography

Replace the reference to IEC 60728-2:2002 by:

EN 50083-2:2001, *Cable networks for television signals, sound signals and interactive services – Part 2: Electromagnetic compatibility for equipment*

Add the following annexes:

Annex ZA (normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.

NOTE If it affects harmonization, it forms part of the European Standard.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

Clause Special national condition

6 **Norway**

In most parts of Norway the AC power distribution systems are built as IT networks with a line-to-line voltage of 230 V. In these cases the equipotential bonding within a cable network has to be performed according to Annex B of this standard.

In parts of Norway where the power distribution systems are built as TN-networks, these special national conditions can be disregarded and the equipotential bonding shall be performed according to Clause 6 of this standard.

11.2.2

Finland

As the conductivity of earth in Finland is lower than what is normal in many other countries, the earthing electrodes in 11.2.2 should be as shown in Figures 16 a), 16 b) or 16 c).

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12.3

Finland

The required wind pressure value is 700 N/m² for buildings up to 30 m.

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Annex ZB (informative)

A-deviations

A-deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CENELEC national member.

This European Standard falls under Directive 73/23/EEC.

NOTE (from CEN/CENELEC IR Part 2:2002 , 2.17) Where standards fall under EC Directives, it is the view of the Commission of the European Communities (OJ No C 59, 1982-03-09) that the effect of the decision of the Court of Justice in case 815/79 Cremonini/Vrankovich (European Court Reports 1980, p. 3583) is that compliance with A-deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted except under the safeguard procedure provided for in the relevant Directive.

A-deviations in an EFTA-country are valid instead of the relevant provisions of the European Standard in that country until they have been removed.

<u>Clause</u>	<u>Deviation</u>
---------------	------------------

9	France (Arrêté interministériel, 2 April 1991)
----------	----------------------------------------------------------

This regulation specifies, among many other parameters, the minimum distance between electric supply wires (isolated and not isolated, low-voltage and high-voltage) and any other installation (e.g. buildings, antennas, telecommunication lines, etc.).

The main clauses of this regulation which concern the cable networks are Clauses 12, 25, 26, 33, 33bis, 38, 49, 51, 52 and 63.

Clause 9 of this standard specifies distances of 10 mm (indoors) and 20 mm (outdoors) and this is not sufficient to cover overhead cables. As an example, the minimum distance between an overhead telecommunication line and an overhead low-voltage (up to 1 kV) electricity supply line shall be 1 m (Clause 33). This distance may be reduced under specified conditions (Clauses 51, 52 and 63).

This regulation specifies also the minimum distance from high-voltage lines. This distance varies from 1 m to 4 m depending on the voltage, on the isolation of the cable and on the location (built-up area or not) (Clauses 33 and 63)

11	France (NF C 15100 - Décret n° 84-74 du 26 janvier 1984 modifié)
-----------	----------------------------------------------------------------------------

The use of TT distribution systems with 300 mA differential switching is not compatible with the interconnection of the earthing of two different buildings.

Annex ZC (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 Where 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>
-	-	Coaxial cables Part 1: Generic specification	EN 50117-1	Series
IEC 60065 (mod)	2001	Audio, video and similar electronic apparatus - Safety requirements	EN 60065	2002
IEC 60364	Series	Electrical installations of buildings	HD 384 HD 60364	Series
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
A1	1999		A1	2000
IEC 60825-1	1993	Safety of laser products	EN 60825-1	1994
A1	1997	Part 1: Equipment classification, requirements and user's guide	A1	2002
A2	2001		A2	2001
IEC 60825-2	2000	Part 2: Safety of optical fibre communication systems	EN 60825-2	2000 ¹⁾
IEC 60950-1 (mod)	2001	Information technology equipment - Safety Part 1: General requirements	EN 60950-1 + A11 + corr. April	2001 2004 2004
IEC 61024-1	1990	Protection of structures against lightning Part 1: General principles	-	-
ISO 3864-1	2002	Graphical symbols - Safety colours and safety signs Part 1: Design principles for safety signs in workplaces and public areas	-	-

¹⁾ EN 60825-2 is superseded by EN 60825-2:2004 which is based on IEC 60825-2:2004.

INTERNATIONAL STANDARD

IEC 60728-11

Second edition
2005-01

Cable networks for television signals, sound signals and interactive services –

Part 11: Safety

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CABLE NETWORKS FOR TELEVISION SIGNALS,
SOUND SIGNALS AND INTERACTIVE SERVICES –****Part 11: Safety**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60728-11 has been prepared by technical area 5: Cable networks for television signals, sound signals and interactive services, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition cancels and replaces the first edition published in 1997 and its amendment 1 (2000). This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Clause 6, Equipotential bonding and earthing, has been rewritten.
- b) Clause 8, Remote power feeding in cable networks, has been rewritten.
- c) New informative Annex A: Use of shield wires to protect installations with coaxial cables
- d) New informative Annex B: Special conditions using IT power line networks

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

FDIS	Report on voting
100/847A/FDIS	100/896/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.

IEC 60728 consists of the following parts, under the general title *Cable networks for television signals, sound signals and interactive services*:

- Part 1: Methods of measurement and system performance
- Part 2: Electromagnetic compatibility for equipment
- Part 3: Active coaxial wideband distribution equipment
- Part 4: Passive coaxial wideband distribution equipment
- Part 5: Headend equipment
- Part 6: Optical equipment
- Part 7: Hybrid fibre coax outside plant status monitoring
- Part 9: Interfaces of cabled distribution systems for digitally modulated signals
- Part 10: System performance of return path
- Part 11: Safety (this publication)
- Part 12: Electromagnetic compatibility of systems

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The following differences exist in some countries: 60728-11-2006

Clause 6:

- The following parts of the standard cannot be used in areas with an IT power distribution system:
 - Examples of installations inside buildings described in 6.2g) and shown in Figures 3 and 4 cannot be used in areas with an IT-network (Norway).
 - Examples of installations inside buildings described in 6.2i) and shown in Figure 6 should be equipped with a galvanic isolator separating local earth from the cable network distribution lines (Norway).
 - Examples of installations inside buildings described in 6.2.11 and shown in Figure 7 should be equipped with a galvanic isolator separating local earth from the cable network distribution lines (Norway).
 - Subclauses 6.3.4, 6.3.4.1, 6.3.4.2 and 6.3.5 have no relevance for cable networks in areas with an IT power distribution system (Norway).
- Common earthing is not permitted due to electrical earthing conditions (France).

Subclause 6.2:

- Galvanic isolation should withstand a voltage of 1 kV r.m.s. during 1 min (France).
- The equipotential bonding method is not used in Japan (Japan).
- Earthing to gas networks as shown in Figures 3 and 4 is not admitted (Japan, Poland).

Subclause 8.1:

- Remote power feeding voltage shall not exceed 90 V AC r.m.s and the line-powering current shall not exceed 15 A (Japan).

Clause 9:

- The French regulation (arrêté interministériel, 2 April 1991) specifies, among many other parameters, the minimum distance between electric supply wires (isolated and non-isolated, low-voltage and high-voltage) and any other installation (for example, buildings, antennas, telecommunication lines, etc.). The main clauses of this regulation, which concern the cable networks, are Clauses 12, 25, 26, 33, 33bis, 38, 49, 51, 52 and 63. Clause 9 of this standard specifies distances of 10 mm (indoors) and 20 mm (outdoors), and this is not sufficient to cover overhead cables. As an example, the minimum distance between an overhead telecommunication line and an overhead low-voltage (up to 1 kV) electricity supply line should be 1 m (Clause 33). This distance may be reduced under specific conditions (Clauses 51, 52 and 63). This regulation specifies also the minimum distance from high-voltage lines. This distance varies from 1 m to 4 m depending on the voltage, on the isolation of the cable and on the location (built-up area or not) (Clauses 33 and 63) (France).
- For antennas in proximity of voltages up to 7 000 V, the following applies in Japan:
 1. Low voltage: ≤ 600 V a.c. or ≤ 750 V d.c.;
 Cable: ≥ 30 cm distance;
 Isolated wire: ≥ 60 cm distance.
 2. High voltage: > 600 V a.c. or > 750 V d.c.;
 Cable: ≥ 40 cm distance;
 Isolated wire: ≥ 80 cm distance.

Clause 10:

- The resistance to the equipotential point is not applied, because the bonding method is not used in Japan. Japanese regulations specify applying the safety terminal. The safety terminal withstands a continuous a.c. test voltage of 1 000 V for a period of not less than 1 min and maintains an insulation resistance of not less than 1,0 M Ω . Installation of a safety terminal at the junction point between the indoor cabling and the feeder cable of the distribution system is shown in Figure 14 (Japan).

Clause 11:

- A lightning protection system is applied in Japan for protection against atmospheric over-voltages and for the elimination of potential differences. In Japan, installation of a lightning protection system is necessary in the case where the topmost height of the construction exceeds 20 m, except in those cases where the construction is inside the safety zone of another lightning protection system (see Figure 15) (Japan).

Subclause 11.1.1:

- An equipotential bonding conductor is not used, because the bonding method is not used in Japan (Japan).

Subclause 11.2.2:

- An earth termination system is not used in Japan. Only a lightning protection system is applied (see Figure 15) (Japan).
- As the conductivity of earth in Finland is lower than what is normal in many other countries, the earthing electrodes in 11.2.2 should be as shown in Figures 16 a), 16 b) or 16 c) (Finland).