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REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Cable networks for television signals, sound signals and interactive services – Part 11: Safety

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CONTENTS

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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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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60728-11:2016. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

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. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2016. This edition constitutes a technical revision.

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

a) Replacement of references to IEC 60065 and IEC 60950-1 with references to IEC 62368-1.
b) Addition of subclauses 4.4 to 4.6.
c) Revised definition of class I equipment, class II equipment, main earthing terminal, see 3.1.6, 3.1.8 and 3.1.31.
d) Addition of definitions for harm, hazard, ordinary person, instructed person, skilled person, see 3.1.22, 3.1.23, 3.1.39, 3.1.40 and 3.1.41.
e) Additional requirement to provide details on the equipment installed, see 4.1.
f) Additional mechanical, design and construction requirements, see 4.2.2.
g) Changes to the accessible part requirements, see 4.2.3.
h) The current carrying capacity and dielectric strength of components is now obligatory, see 8.1.3.
i) The assessment of the risk of lightning strike is now obligatory, see Figure 10.
j) Extension of remote feeding voltage on subscriber feeder, see Table 1.

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

Draft	Report on voting
100/3866/FDIS	100/3882/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.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The list of all the parts of the IEC 60728 series, under the general title *Cable networks for television signals, sound signals and interactive services,* can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Standards and other deliverables of the IEC 60728 series deal with cable networks including equipment and associated methods of measurement for headend reception, processing and distribution of television and sound signals and for processing, interfacing and transmitting all kinds of data signals for interactive services using all applicable transmission media. These signals are typically transmitted in networks by frequency-multiplexing techniques.

This includes for instance:

- regional and local broadband cable networks,
- extended satellite and terrestrial television distribution networks and systems,
- individual satellite and terrestrial television receiving systems,

and all kinds of equipment, systems and installations used in such cable networks, distribution and receiving systems.

The extent of this standardization work is from the antennas and/or special signal source inputs to the headend or other interface points to the network up to the terminal input of the customer premises equipment.

The standardization work will consider coexistence with users of the RF spectrum in wired and wireless transmission systems.

The standardization of any user terminals (i.e. tuners, receivers, decoders, multimedia terminals, etc.) as well as of any coaxial, balanced and optical cables and accessories thereof is excluded.

CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

Part 11: Safety

1 Scope

This part of IEC 60728 deals with the safety requirements applicable to fixed sited systems and equipment. As far as applicable, it is also valid for mobile and temporarily installed systems, for example, caravans.

Additional requirements may be applied, for example, referring to:

- electrical installations of buildings and overhead lines,
- other telecommunication services distribution systems,
- water distribution systems,
- gas distribution systems,
- lightning systems.

This document is intended to provide requirements specifically for the safety of the system, personnel working on it, subscribers and subscriber equipment. It deals only with safety aspects and is not intended to define a standard for the protection of the equipment used in the system.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

~~IEC 60065:2014, *Audio, video and similar electronic apparatus – Safety requirements*~~

IEC 60364-1:2005, *Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*
IEC 60364-4-44:2007/AMD1:2015
IEC 60364-4-44:2007/AMD2:2018

IEC 60364-5-52:2009, *Low-voltage electrical installations – Part 5-52: Selection and erection of electrical equipment – Wiring systems*

IEC 60364-5-54:2011, *Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors*
IEC 60364-5-54:2011/AMD1:2021

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

~~IEC 60728-2, *Cable networks for television signals, sound signals and interactive services – Part 2: Electromagnetic compatibility for equipment*~~

~~IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*~~

~~IEC 60825-2, *Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCS)*~~

~~IEC 60950-1:2005, *Information technology equipment – Safety – Part 1: General requirements*~~

IEC 60990:2016, *Methods of measurement of touch current and protective conductor current*

~~IEC 61140:2001, *Protection against electric shock – Common aspects for installation and equipment*~~
~~IEC 61140:2001/AMD1:2004~~

~~IEC 62305 (all parts), *Protection against lightning*~~

IEC 62305-2:2010, *Protection against lightning – Part 2: Risk management*

IEC 62305-3:2010, *Protection against lightning – Part 3: Physical damage to structures and life hazard*

~~IEC 62305-4:2010, *Protection against lightning – Part 4: Electrical and electronic systems within structures*~~

IEC 62368-1:2018, *Audio/video, information and communication technology equipment – Part 1: Safety requirements*

IEC 62561-1:2017, *Lightning protection system components (LPSC) – Part 1: Requirements for connection components*

IEC 62561-2, *Lightning protection system components (LPSC) – Part 2: Requirements for conductors and earth electrodes*

~~ISO 3864-1:2011, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs in workplaces and public areas*~~

ISO 7010, *Graphical symbols – Safety colours and safety signs – Registered safety signs*

ISO/IEC 30129:2015, *Information technology – Telecommunications bonding networks for buildings and other structures*
ISO/IEC 30129:2015/AMD1:2019

~~EN 50117 (all parts), *Coaxial cables*~~

~~EN 50164-1, *Lightning Protection Components (LPC) – Part 1: Requirements for connection components*~~

~~EN 50164-2, *Lightning Protection Components (LPC) – Part 2: Requirements for conductors and earth electrodes*~~

~~EN 50174-2, *Information technology – Cabling installation – Part 2: Installation planning and practices inside buildings*~~

~~EN 50310, *Application of equipotential bonding and earthing in buildings with information technology equipment*~~

EN 50575:2014, *Power, control and communication cables – Cables for general applications in construction works subject to reaction to fire requirements*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp.

~~NOTE Some terms have been taken from IEC 60050-195, IEC 60050-826 and IEC 60050-851, with the reference number in square brackets, and from other IEC standards, also referenced to in square brackets.~~

3.1.1
air-termination system
part of an external LPS using metallic elements such as rods, mesh conductors or catenary wires intended to intercept lightning flashes

[SOURCE: IEC 62305-3:2010, 3.6]

3.1.2
amplifier
device to compensate for attenuation

3.1.3
attenuation
ratio of the input power to the output power

Note 1 to entry: The ratio is expressed in decibels.

3.1.4
cable networks
television signals, sound signals and interactive services, regional and local broadband cable networks, extended satellite and terrestrial television distribution networks or systems and individual satellite and terrestrial television receiving systems

Note 1 to entry: These networks and systems can be used in downstream and upstream directions.

3.1.5
CATV network
regional and local broadband cable networks designed to provide sound and television signals as well as signals for interactive services to a regional or local area

Note 1 to entry: Originally defined as Community Antenna Television network.

3.1.6
class I equipment
~~equipment with basic insulation as provision for basic protection and protective bonding as provision for fault protection, in accordance with IEC 61140:2001, 7.1~~

~~[SOURCE: IEC 60050-851:2008, 851-15-10]~~

equipment in which protection against electric shock does not rely on basic insulation only, but that includes a supplementary safeguard in such a way that means are provided for the connection of accessible conductive parts to the protective earthing conductor in the fixed wiring of the installation

Note 1 to entry: For equipment intended for use with a flexible cord or cable, this provision includes a protective conductor as part of the flexible cord or cable.

Note 2 to entry: Class I equipment can be provided with class II construction.

Note 3 to entry: This entry is based on IEC 62368-1:2018, 3.3.15.1.

3.1.7
class II construction
part of an equipment for which protection against electric shock relies upon double insulation or reinforced insulation

Note 1 to entry: This entry is based on IEC 62368-1:2018, 3.3.15.2.

3.1.8
class II equipment
~~equipment with basic insulation as provision for basic protection, and supplementary insulation as provision for fault protection, or in which basic and fault protection are provided by reinforced insulation, in accordance with IEC 61140:2001, 7.3~~

~~[SOURCE: IEC 60050-851:2008, 851-15-11]~~

equipment in which protection against electric shock does not rely on basic insulation only, but in which a supplementary safeguard is provided, there being no provision for protective earthing or reliance upon installation conditions

Note 1 to entry: This entry is based on IEC 62368-1:2018, 3.3.15.3.

3.1.9
earthing arrangement
~~all the electric connections and devices involved in the earthing of a system, an installation and equipment~~

~~[SOURCE: IEC 60050-195:1998, 195-02-20, modified – The preferred term "grounding arrangement (US), and the deprecated term "earthing system" have been deleted.]~~

all electrical means involved in the earthing of a system, installation or equipment

Note 1 to entry: Electric connection and devices used for earthing are examples of electrical means.

[SOURCE: IEC 60050-195:2021, 195-02-20, modified – The preferred term "grounding arrangement (US)" has been deleted.]

3.1.10
earthing conductor
~~conductor which provides a conductive path, or part of the conductive path, between a given point in a system or in an installation or in equipment and an earth electrode or an earth-electrode network~~

~~Note 1 to entry: In the electrical installation of a building, the given point is usually the main earthing terminal, and the earthing conductor connects this point to the earth electrode or the earth-electrode network.~~

~~[SOURCE: IEC 60050-826:2004, 826-13-12, modified – The preferred term "grounding conductor (US)", and the deprecated term "earth conductor" have been deleted.]~~

conductor forming a conductive path between a conductive part and an earth electrode