IEC 60728-11

Edition 4.0 2016-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

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

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs – Partie 11: Sécurité

IEC 60728-11:2016-03(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 11: Safety

FOREWORD

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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 fourth edition cancels and replaces the third edition published in 2010. This edition constitutes a technical revision.

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

- Correction of minimum cross-section of bonding conductor in Figure 6, Figure 14 and Figure 17.
- Verbal modification of 11.3.1.2.

- Creation of new symbols for “overvoltage protective device – (OPD)” and for “coaxial overvoltage protective device – (COPD)”.
- Introduction of new OPD symbol to 3.2, Figure 3 and Figure 6.
- Introduction of new COPD symbol to 3.2 and Figure 19.
- In 3.1 replacement of terms CATV, MATV and SMATV by new terms and definitions due to changes in technology and use of cable networks.
- New Figures 18a to 18d.
- Deletion of Figure 19.
- Extension for remote feeding voltage on subscriber feeder.
- Adaption to Edition 2.0 of the IEC 62305 series.
- Deletion of informative Annex C and normative reference to the simplified software for the calculation of risk due to lightning (Annex J of IEC 62305-2:2006[1].
- New subclause 10.2.6 Fully-isolated system outlet provided by means of a FTTH system.

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

FDIS	Report on voting
100/2592/FDIS	100/2636/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 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.

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

The committee has decided that the contents of this 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.

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.

The contents of the corrigendum of July 2016 have been included in this copy.

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1 IEC 62305-2:2006, *Protection against lightning – Part 2: Risk management*

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 standard is intended to provide 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, 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.

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

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

IEC 60364-4-44, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

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

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

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

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, *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*

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

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*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

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

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 decibel.

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]

3.1.7
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]

3.1.8
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.]

3.1.9
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.]

3.1.10
earth electrode
conductive part, which may be embedded in the soil or in a specific conductive medium, e.g. concrete or coke, in electric contact with the Earth

[SOURCE: IEC 60050-826:2004, 826-13-05, modified – The preferred term "ground electrode (US)" has been deleted.]

3.1.11
earthing terminal
terminal provided on equipment or on a device and intended for the electric connection with the earthing arrangement

[SOURCE: IEC 60050-195:1998, 195-02-31, modified – The preferred term "grounding terminal (US), and the deprecated term "earth terminal" have been deleted.]

3.1.12
electric shock
physiological effect resulting from an electric current through a human or animal body

[SOURCE: IEC 60050-826:2004, 826-12-01]

3.1.13
equipotential bonding
provision of electric connections between conductive parts, intended to achieve equipotentiality

[SOURCE: IEC 60050-826:2004, 826-13-19]

3.1.14
equipotential bonding bar
bar which is part of an equipotential bonding system and enables the electric connection of a number of conductors for equipotential bonding purposes

[SOURCE: IEC 60050-826:2004, 826-13-35]

3.1.15
protective bonding conductor
protective conductor provided for protective-equipotential-bonding

[SOURCE: IEC 60050-826:2004, 826-13-24, modified – The deprecated term "equipotential bonding conductor" has been deleted.]

3.1.16
exposed conductive part
conductive part of equipment which can be touched and which is not normally live, but which can become live when basic insulation fails

[SOURCE: IEC 60050-195:1998, 195-06-10]

3.1.17
extended satellite television distribution network or system
distribution network or system designed to provide sound and television signals received by satellite receiving antenna to households in one or more buildings

Note 1 to entry: This kind of network or system can be combined with terrestrial antennas for the additional reception of TV and/or radio signals via terrestrial networks.

Note 2 to entry: This kind of network or system can also carry control signals for satellite switched systems or other signals for special transmission systems (e.g. MoCA or WiFi) in the return path direction.

3.1.18
extended terrestrial television distribution network or system
distribution network or system designed to provide sound and television signals received by terrestrial receiving antenna to households in one or more buildings

Note 1 to entry: This kind of network or system can possibly be combined with a satellite antenna for the additional reception of TV and/or radio signals via satellite networks.

Note 2 to entry: This kind of network or system can also carry other signals for special transmission systems (e.g. MoCA or WiFi) in the return path direction.

3.1.19
extraneous conductive part
conductive part not forming part of the electrical installation and liable to introduce an electric potential, generally the electric potential of a local earth

[SOURCE: IEC 60050-195:1998, 195-06-11]

3.1.20
feeder
transmission path forming part of a cable network

Note 1 to entry: Such a path may consist of a metallic cable, optical fibre, waveguide or any combination of them.

Note 2 to entry: By extension, the term is also applied to paths containing one or more radio links.

3.1.21
galvanic isolator
device providing electrical isolation below a certain frequency range

3.1.22
hazardous voltage
electrical condition of an object from which a hazardous touch current (electric shock) could be drawn

[SOURCE: IEC 60065:2014, 2.6.10, modified – The term "hazardous live" has been replaced by "hazardous voltage".]

3.1.23
headend
equipment connected between receiving antennas or other signal sources and the remainder of the cable network, to process the signals to be distributed

3.1.24
home distributor
HD
physical distribution point within a home where cables terminate

Note 1 to entry: This note applies to the French language only.

3.1.25
individual satellite television receiving system
system designed to provide sound and television signals received from satellite(s) to an individual household

Note 1 to entry: This kind of system can also carry control signals for satellite switched systems or other signals for special transmission systems (e.g. MoCA or WiFi) in the return path direction.