SLOVENSKI STANDARD
SIST EN IEC 60728-11:2024

01-februar-2024

Kabelska omrežja za televizijske in zvokovne signale ter interaktivne storitve - 11. del: Varnost (IEC 60728-11:2023)

Cable networks for television signals, sound signals and interactive services - Part 11: Safety (IEC 60728-11:2023)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 11: Sicherheitsanforderungen (IEC 60728-11:2023)

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs - Partie 11: Sécurité (IEC 60728-11:2023)

Ta slovenski standard je istoveten z: **EN IEC 60728-11:2023**

ICS:

33.060.40 Kabelski razdelilni sistemi Cabled distribution systems

SIST EN IEC 60728-11:2024 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60728-11

June 2023

ICS 33.060.40

Supersedes EN 60728-11:2017; EN 60728-11:2017/A11:2018

English Version

Cable networks for television signals, sound signals and interactive services - Part 11: Safety (IEC 60728-11:2023)

Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion sonore et services interactifs - Partie 11: Sécurité (IEC 60728-11:2023)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 11: Sicherheitsanforderungen (IEC 60728-11:2023)

This European Standard was approved by CENELEC on 2023-05-23. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 60728-11:2023 E

European foreword

The text of document 100/3866/FDIS, future edition 5 of IEC 60728-11, prepared by IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60728-11:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-02-23
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-05-23

This document supersedes EN 60728-11:2017 and all of its amendments and corrigenda (if any).

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

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60728-11:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60364 (series)	NOTE	Approved as HD 60364 (series)
IEC 60728-1	NOTE	Approved as EN 60728-1

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
-	-	Power, control and communication cables - Cables for general applications in construction works subject to reaction to fire requirements	EN 50575 + A1	2014 2016
IEC 60364-1 (mod)	2005	Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions	HD 60364-1 + A11	2008 2017
IEC 60364-4-44 (mod) + A1 (mod) + A2	2007 2015 2018	Low-voltage electrical installations - Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	HD 60364-4-442 HD 60364-4-443 HD 60364-4-444	2012 2016 2010
IEC 60364-5-52 (mod)	2009	Low-voltage electrical installations - Part 5-52: Selection and erection of electrical equipment - Wiring systems	HD 60364-5-52	2011
IEC 60364-5-54 + A1	2011 2021	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors	HD 60364-5-54 + A11 + A1	2011 2017 2022
IEC 60529 + A1 + A2	1989 1999 2013	Degrees of protection provided by enclosures (IP Code)	EN 60529 + A1 + A2	1991 2000 2013
IEC 60990	2016	Methods of measurement of touch current and protective conductor current	EN 60990	2016
IEC 62305-2 (mod)	2010	Protection against lightning - Part 2: Risk management	EN 62305-2	2012
IEC 62305-3 (mod)	2010	Protection against lightning - Part 3: Physical damage to structures and life hazard	EN 62305-3	2011
IEC 62368-1	2018	Audio/video, information and communication technology equipment - Part 1: Safety requirements	EN IEC 62368-1	2020

Publication	Year	Title	EN/HD	Year
IEC 62561-1	2017	Lightning Protection System Components (LPSC) - Part 1: Requirements for connection components	EN 62561-1	2017
IEC 62561-2	2018	Lightning protection system components (LPSC) - Part 2: Requirements for conductors and earth electrodes	EN IEC 62561-2	2018
ISO 7010	2011	Graphical symbols - Safety colours and safety signs - Registered safety signs	-	-
ISO/IEC 30129 + A1	2015 2019	Telecommunications bonding networks for buildings and other structures	EN 50310 + A1	2016 2020

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 CEN and/or CENELEC member.

This European Standard does not fall under any Directive/Regulation of the EU.

In the relevant CEN and/or CENELEC countries, these A-deviations are valid instead of the respective provisions of the European Standard until the national situation causing the A-deviation has changed.

Clause	Deviation
9	**ZB.1 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)
10.1	**ZB.2 United Kingdom** In the UK the use of fully isolated system outlets is obligatory except where back-powering to a network or to outdoor equipment such as preamplifiers, low-noise converters, polarizers, transmitters in antenna installations is necessary then requirements of 8.2 apply.
11	**ZB.3 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)

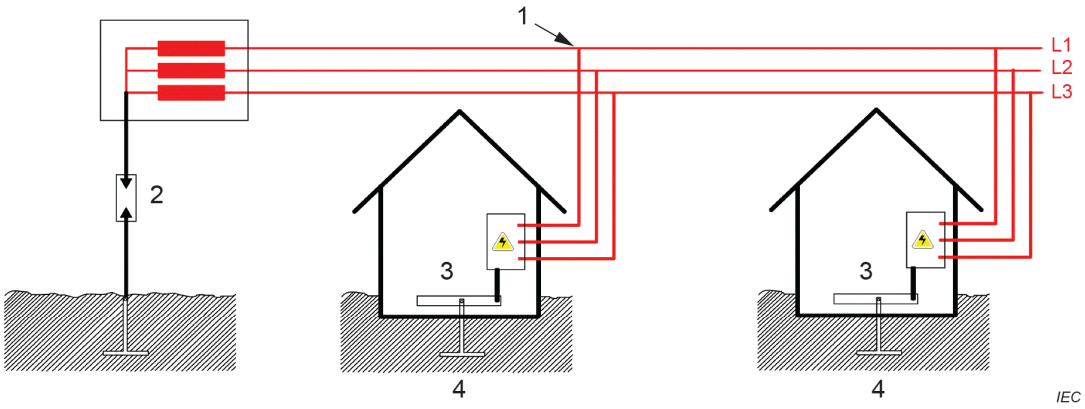
Special national conditions

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
6.2	**ZC.1 Norway**
	The following parts of the standard are not applicable due to Special National Conditions:
	For new and rebuilt coaxial electronic communication networks the outer conductor of the coaxial cable leading into a building shall be galvanic and isolated from the outer conductor of the coaxial cable inside the building;
	Examples of installations inside buildings described in 6.2g, 6.2i, 6.2l and shown in Figure 2, Figure 4, Figure 5 and Figure 7 shall be equipped with a galvanic isolator separating local earth from the cable network distribution lines;
	Galvanic isolators shall withstand the following requirements:
	Applying a 50 Hz AC voltage of 300 V $_{RMS}$ between the input and the output of the outer conductor of the galvanic isolator for a period of not less than 20 min, the leakage current shall not exceed 8 mA $_{RMS}$. Applying a continues DC voltage of 2 120 V between the input and the output of the outer conductor of the galvanic isolator for a period of not less than 1 min, the leakage current shall not exceed 0,7 mA.
	It shall not be possible to touch metallic parts of the galvanic isolator when connected.
6.3	**ZC.2 Norway**
	ZC.2.1 Justification
	In most parts of Norway, the AC mains power are built as an IT- or TT-network with a line-to-line voltage of 230 V (see Figure ZC.1).
	These types of networks have no N-conductor, and the AC mains power is supplied to the equipment from two of the three line conductors (IEC 62386-1:2018, Annex V).



Key

1 AC power distribution, IT system, line-to-line voltage 230 V

2 Voltage limiter

3 Equipotential bonding bar

4 Earth electrode

Figure ZC.1 — IT power distribution system in Norway

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

ZC.2.2 Equipotential bonding mechanism for cable networks

ZC.2.2.1 Installations in the vicinity of transformer stations

Any earth electrode in a cable network shall preferably be located at a minimum distance of 20 m from the nearest earth electrode in a high-power transformer station (high to mains voltage) (see Figure ZC.2 and ITU-T K.8 or EN 50174-3).

If the above-mentioned distance is less than 20 m, all equipment in the cable network shall be electrically isolated from local earth by mounting the equipment within a non-metallic enclosure, as shown in Figure ZC.3. Mains powered equipment with local power feeding should not be used in this case.

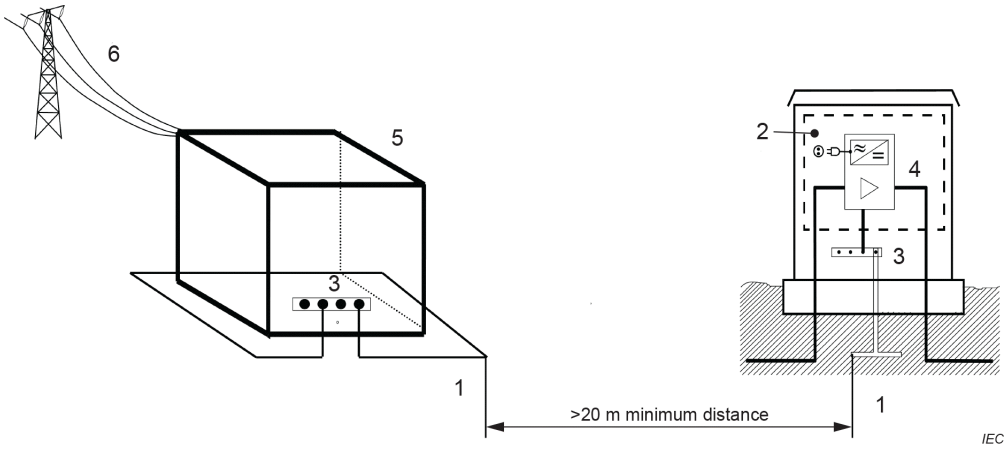
Before any work on the installation is started, measurements shall be carried out to reveal if there are any hazardous voltages between local earth and the earth for the cable network.

The safety sign "Warning about hazardous electrical voltage"  ISO 7010-W012:2011-05 shall be attached to the non-metallic enclosure.

ZC.2.2.2 Cabinets for cable networks located near cabinets/ installations for mains

Cabinets for cable networks placed together with cabinets for mains power distributions should preferably be placed at a minimum of 2 m apart. If the distance is closer than 2 m, a common earth electrode between the cabinets shall be used. Examples of such installations are shown in Figure ZC.4, Figure ZC.5, Figure ZC.6 and Figure ZC.7.

Figure ZC.2 shows an example of installations located farther than 20 m away from a transforming station.

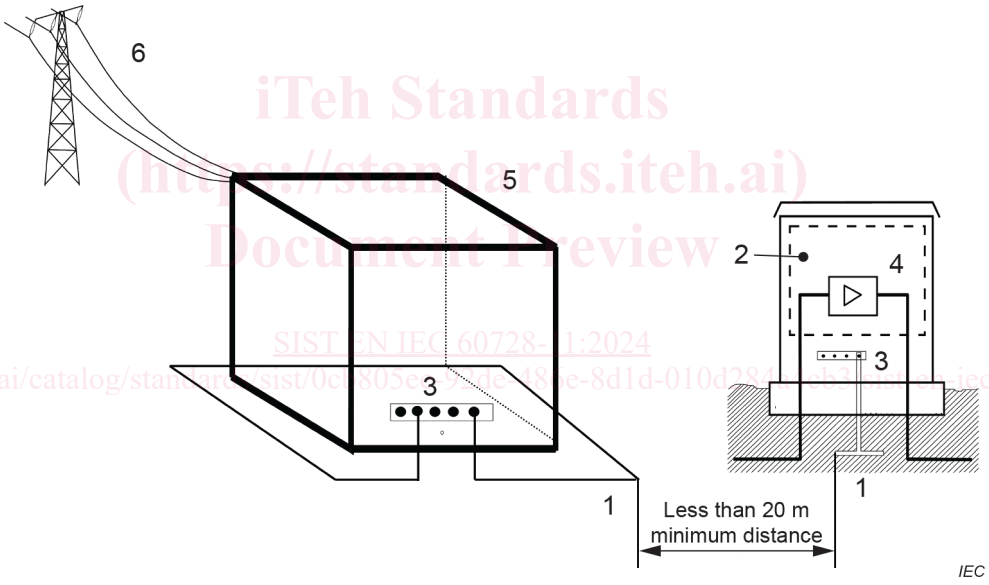


Key

1 Earth electrode
2 Non-metallic enclosure
3 Equipotential bonding bar
4 Mains supplied equipment
5 Transforming station
6 High-voltage power transmission system

Figure ZC.2 — Example of installations located farther than 20 m away from a transforming station

Figure ZC.3 shows an example of installations located closer than 20 m from a transforming station.

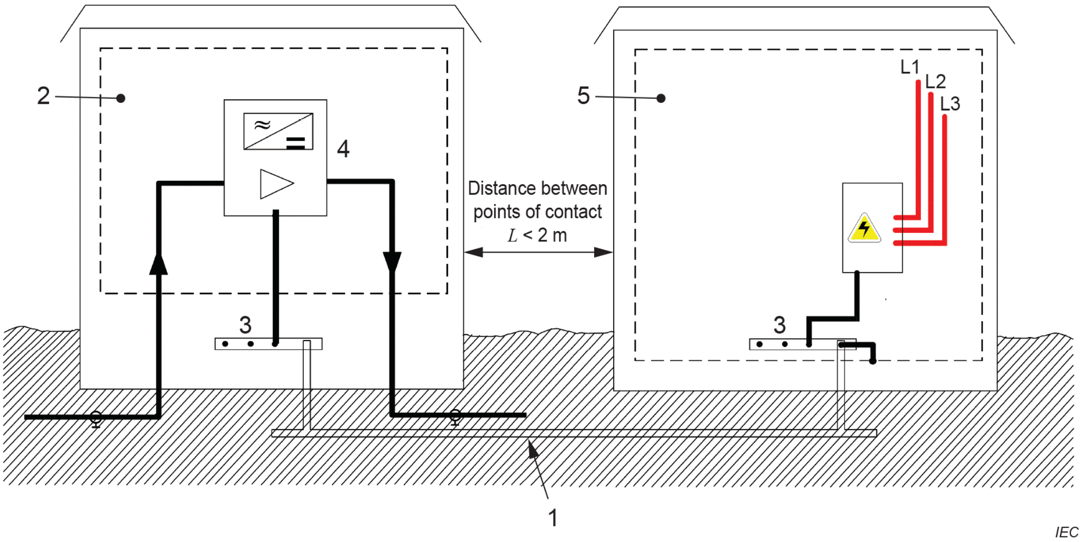


Key

1 Earth electrode
2 Non-metallic enclosure
3 Equipotential bonding bar
4 Remotely supplied equipment
5 Transforming station
6 High-voltage power transmission system

Figure ZC.3 — Example of installations located closer than 20 m from a transforming station

Figure ZC.4 shows an example of cabinets for cable network with locally fed equipment and mains placed less than 2 m apart.



Key

1 Common earth electrode

2 Non-metallic enclosure

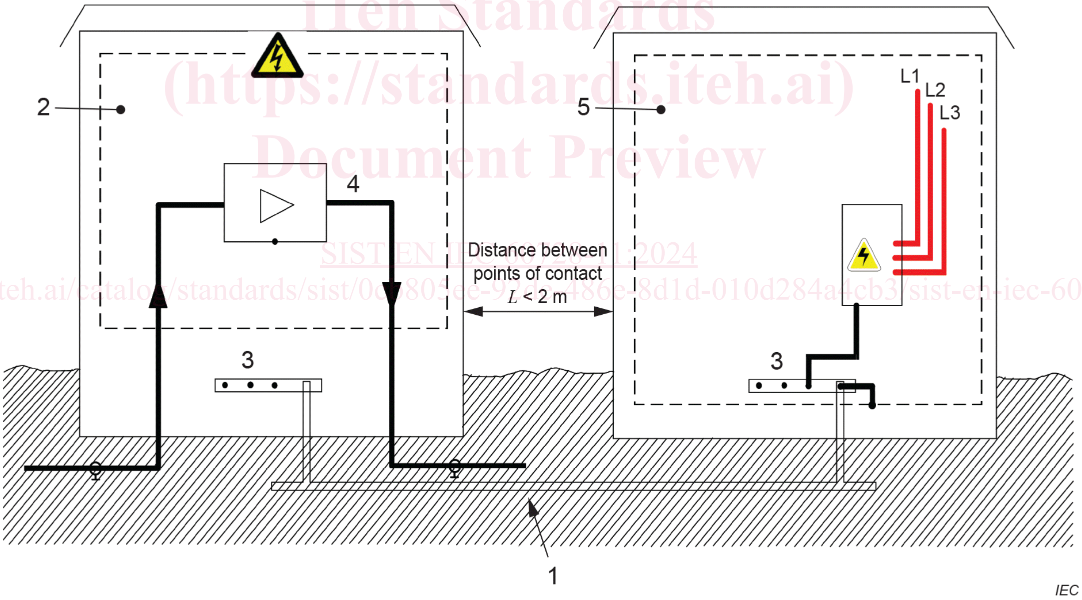
3 Equipotential bonding bar

4 Mains supplied equipment

5 Metallic enclosure

Figure ZC.4 — Example of cabinets for cable network with locally fed equipment and mains placed less than 2 m apart

Figure ZC.5 shows an example of cabinets for cable network with remotely fed equipment and mains placed less than 2 m apart.



Key

1 Common earth electrode

2 Non-metallic enclosure

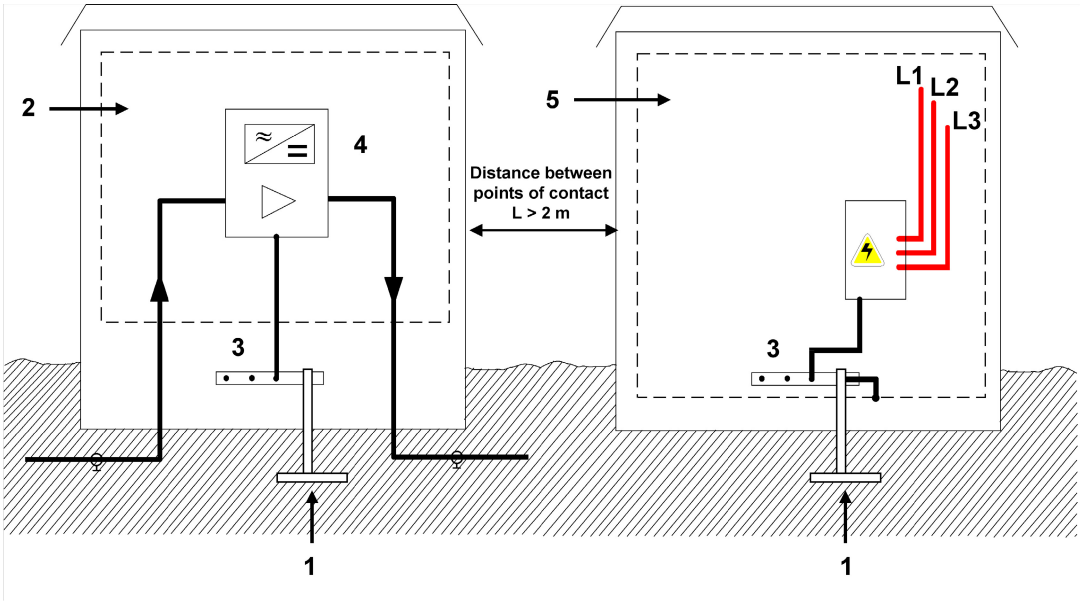
3 Equipotential bonding bar

4 Remotely supplied equipment

5 Metallic enclosure

Figure ZC.5 – Example of cabinets for cable network with remotely fed equipment and mains placed less than 2 m apart

Figure ZC.6 shows an example of cabinets for cable network with locally fed equipment and mains placed more than 2 m apart.

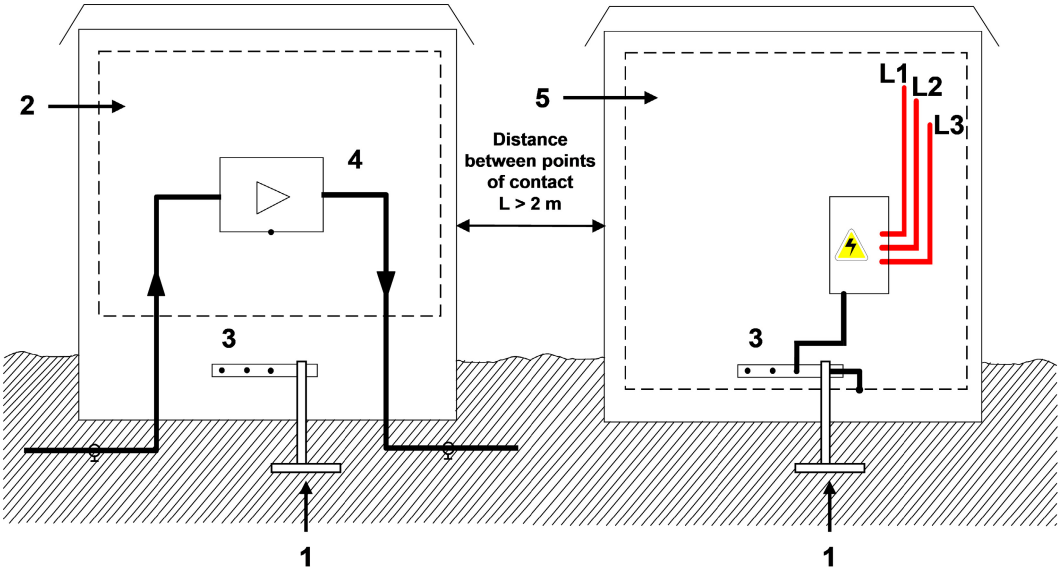


Key

1 Earth electrode
2 Non-metallic enclosure
3 Equipotential bonding bar
4 Mains supplied equipment
5 Metallic enclosure

Figure ZC.6 — Example of cabinets for cable network with locally fed equipment and mains placed more than 2 m apart

Figure ZC.7 shows an example of cabinets for cable network with remotely fed equipment and mains placed more than 2 m apart.



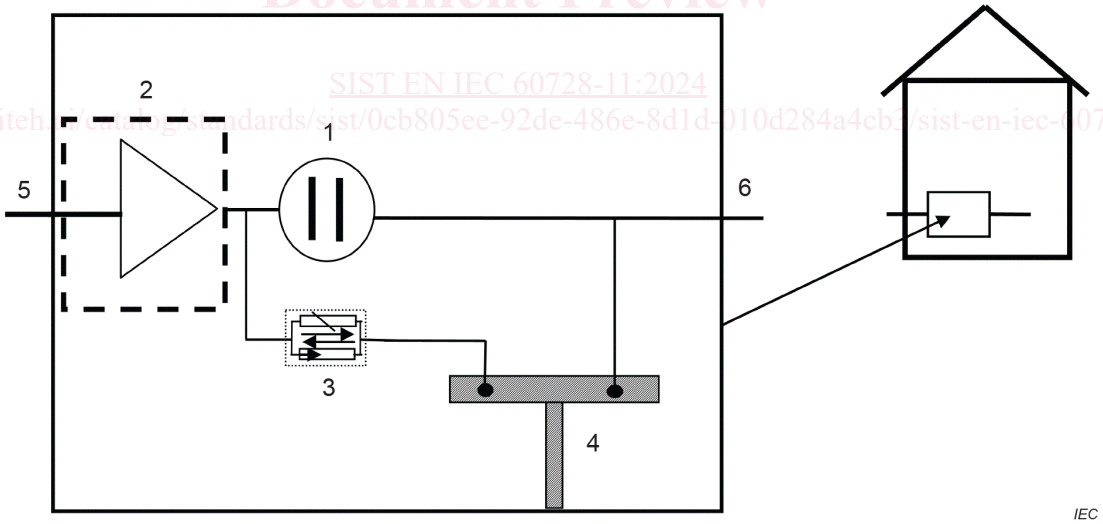
Key

1 Earth electrode
2 Non-metallic enclosure
3 Equipotential bonding bar
4 Remotely supplied equipment
5 Metallic enclosure

Figure ZC.7 — Example of cabinets for cable network with remotely fed equipment and mains placed more than 2 m apart

ZC.2.3 Use of galvanic isolation in a cable network with remote power-feeding

When using galvanic isolation in cable networks with remote power feeding, the amplifier shall be placed in front of the galvanic isolator as shown in Figure ZC.8.



Key

1 Galvanic isolator
2 Non-metallic enclosure
3 Voltage dependent protection device
4 Common earth electrode
5 CATV system
6 House internal cable-TV network

Figure ZC.8 – Example of an installation placing the amplifier in front of the galvanic isolator

A voltage dependent protective device is recommended in order to protect the galvanic isolator from transient voltages.

The amplifier shall be electrically isolated from the local electrical earth. In case the amplifier is mounted close to either local electrical earth or installations connected to local electrical earth, the amplifier shall be placed in such a way that it is not possible to physically touch both the amplifier and the installation without having to remove a cover or other safety arrangements. The covers and amplifiers shall be labelled with the safety sign given under ZC.2.2.1. The covers used shall be designed in such a way that they can only be removed using a key or a special tool.

ZC.2.4 Use of voltage dependent protective device in a cable network

Network, property and health shall be protected against failure in isolation between infrastructures with different levels of voltage and other unwanted high voltages caused by any kind of high voltage distribution networks or atmospheric discharges.

Depending on the voltages time span, all voltages with local earth as a reference shall be limited according to following values:

0 to 200 ms	1 030 V
201 to 350 ms	780 V
351 to 500 ms	650 V
501 to 1 000 ms	430 V
1 001 to 2 000 ms	300 V
2 001 to 3 000 ms	250 V
3 001 to 5 000 ms	200 V
5 001 to 10 000 ms	150 V
More than 10 000 ms	60 V

In Norway, network installations with no mains supplied equipment are usually installed isolated from local earth due to difficult ground conditions. When calculations show that the voltage level will rise above 650 V, measures must be taken to reduce the voltage level. This can be done by connecting a voltage dependent device between the network installation and local earth. The voltage dependent device must not connect the installations to local earth in case of a short circuit in mains power.

This implies a safe threshold voltage of 420 V.

Examples of protections using a voltage depending device are shown in Figure ZC.8 and Figure ZC.9.