

MADALPINGELISED ELEKTRIPAIGALDISED.

**OSA 5-54: ELEKTRISEADMETE VALIK JA PAIGALDAMINE.
MAANDAMINE JA KAITSEJUHID**

Low-voltage electrical installations

Part 5-54: Selection and erection of electrical equipment

Earthing arrangements and protective conductors

(IEC 60364-5-54:2011)

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

See Eesti standard EVS-HD 60364-5-54:2011+A11:2017 sisaldab Euroopa standardi HD 60364-5-54:2011 ja selle muudatuse A11:2017 ingliskeelset teksti.	This Estonian standard EVS-HD 60364-5-54:2011+A11:2017 consists of the English text of the European standard HD 60364-5-54:2011 and its amendment A11:2017.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 22.07.2011, muudatuse A11 11.08.2017.	Date of Availability of the European standard is 22.07.2011, for A11 11.08.2017
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 29.020, 91.140.50

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English version

**Low-voltage electrical installations -
Part 5-54: Selection and erection of electrical equipment -
Earthing arrangements and protective conductors
(IEC 60364-5-54:2011)**

Installations électriques basse-tension -
Partie 5-54: Choix et mise en œuvre des
matériels électriques -
Installations de mise à la terre et
conducteurs de protection
(CEI 60364-5-54:2011)

Errichten von Niederspannungsanlagen -
Teil 5-54: Auswahl und Errichtung
elektrischer Betriebsmittel -
Erdungsanlagen, Schutzleiter und
Schutzpotentialausgleichsleiter
(IEC 60364-5-54:2011)

This Harmonization Document was approved by CENELEC on 2011-04-27. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document at national level.

Up-to-date lists and bibliographical references concerning such national implementations may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 64/1755/FDIS, future edition 3 of IEC 60364-5-54, prepared by IEC TC 64, Electrical installations and protection against electric shock, was submitted to the IEC-CENELEC parallel vote.

A draft amendment, prepared by the Technical Committee CENELEC TC 64, Electrical installations and protection against electric shock, was submitted to the formal vote.

The combined texts were approved by CENELEC as HD 60364-5-54 on 2011-04-27.

This European Standard supersedes HD 60364-5-54:2007.

The main changes with respect to HD 60364-5-54:2007 are listed below:

- clarification of the definition of protective conductor;
- improved specification of mechanical characteristics of the earth electrode;
- introduction of earth electrode for protection against electric shock and lighting protection;
- annexes describing concrete-embedded foundation earth electrodes and soil-embedded earth electrode.

The following dates were fixed:

- | | | |
|---|-------|------------|
| – latest date by which the existence of the HD has to be announced at national level | (doa) | 2011-10-27 |
| – latest date by which the HD has to be implemented at national level by publication of an harmonized national standard or by endorsement | (dop) | 2012-04-27 |
| – latest date by which the national standards conflicting with the HD have to be withdrawn | (dow) | 2014-04-27 |

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

Endorsement notice

The text of the International Standard IEC 60364-5-54:2011 was approved by CENELEC as a Harmonization Document without any modification.

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

IEC 60079-0	NOTE Harmonized as EN 60079-0.
IEC 60079-14	NOTE Harmonized as EN 60079-14.
IEC 60364-4-43	NOTE Harmonized as HD 60364-4-43.
IEC 60364-5-52	NOTE Harmonized as HD 60364-5-52.
IEC 60364-6	NOTE Harmonized as HD 60364-6.
IEC 60364-7-701:2006	NOTE Harmonized as HD 60364-7-701:2007 (modified).

IEC 60702-1

NOTE Harmonized as EN 60702-1.

IEC 61643-12

NOTE Harmonized as CLC/TS 61643-12.

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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 60364-4-41 (mod)	2005	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41 + corr. July	2007 2007
IEC 60364-4-44 (mod) + corr. May	2007 2010	Low voltage electrical installations - Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	FprHD 60364-4-442	201X ¹⁾
IEC 60364-5-51 (mod)	2005	Electrical installations of building - Part 5-51: Selection and erection of electrical equipment - Common rules	HD 60364-5-51	2009
IEC 60439-2	-	Low-voltage switchgear and controlgear assemblies - Part 2: Particular requirements for busbar trunking systems (busways)	EN 60439-2	-
IEC 60724	-	Short-circuit temperature limits of electric cables- with rated voltages of 1 kV ($U_m = 1,2$ kV) and 3 kV ($U_m = 3,6$ kV)		-
IEC 60909-0	-	Short-circuit currents in three-phase a.c. systems - Part 0: Calculation of currents	EN 60909-0	-
IEC 60949	-	Calculation of thermally permissible short-circuit- currents, taking into account non-adiabatic heating effects		-
IEC 61140	2001	Protection against electric shock - Common aspects for installation and equipment	EN 61140	2002
IEC 61439-1	-	Low-voltage switchgear and controlgear assemblies - Part 1: General rules	EN 61439-1	-
IEC 61439-2	-	Low-voltage switchgear and controlgear assemblies - Part 2: Power switchgear and controlgear assemblies	EN 61439-2	-
IEC 61534-1	-	Powertrack systems - Part 1: General requirements	EN 61534-1	-

¹⁾ At draft stage.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62305	Series	Protection against lightning	EN 62305	Series
IEC 62305-3 (mod)	2006	Protection against lightning - Part 3: Physical damage to structures and life hazard	EN 62305-3 ²⁾ + corr. November + corr. September + A11	2006 2006 2008 2009

²⁾ EN 62305-3 is superseded by EN 62305-3:2011, which is based on IEC 62305-3:2010.

Annex ZB (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 Harmonization Document.

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

Country	Clause N°	Wording
DE	542.1.1	Add the following text at the end of 542.1.1: In Germany, there is an obligation to erect in every new building a foundation earth electrode according to National Standard DIN 18014.
IE	542.2.1	This note does not apply in Ireland
SI	542.2.1 542.3.1	In Slovenia the minimum cross sectional area for steel solid tape or strip as earth electrode or earthing conductor is 100 mm ² .
CZ	542.2.1	In the Czech Republic, besides the steel electrodes which accord with Table ZB.54.1, the minimum size steel earth electrodes whose corrosion and mechanical strength, when embedded in the soil, has a resistivity higher than 50 Ωm, are as shown in to Table E.1.
CZ	542.2.1	In the Czech Republic, metal plates are only used as earth electrodes in certain cases.
NL	542.2.2	In the Netherlands, a single interruption in the earthing arrangement shall not lead to a touch voltage in the installation (connected to this earthing arrangement) that does not comply with Clause 411.
NL	542.2.2	In the Netherlands, the earth electrodes and associated conductors shall be installed at a depth of at least 60 cm. The conductors of an earthing arrangement laid in a loop, or having a circular shape, shall be installed with a distance between them of at least 1 m.
AT	542.2.3	In Austria, water pipes are not permitted as earth electrodes.
BE	542.2.3	In Belgium, water pipes are not permitted as earth electrodes.
CH	542.2.3	In Switzerland, water pipes are not permitted as earth electrodes.
DE	542.2.3	In Germany, water pipes are not permitted as earth electrodes.
FI	542.2.3	In Finland, water pipes are not permitted as earth electrodes.
HR	542.2.3	In Croatia, water pipes are not permitted as earth electrodes.
FI	542.2.3	In Iceland, water pipes are not permitted as earth electrodes.
IE	542.2.3	In Ireland, metal pipe systems of other services such as water, gas, fuel supply or central heating systems are not permitted for earth electrodes.
FR	542.2.3	In France, water pipes are not permitted as earth electrodes.
SE	542.2.3	In Sweden, water pipes are not permitted as earth electrodes.
UK	542.2.3	In the UK, a metallic pipe forming part of a water utility supply may not be used as an earth electrode.
IT	542.2.3	In Italy, it is permitted to use a water pipe system, but only with the consent of the water distributor.
IS	542.2.3	In Iceland, water pipes are not permitted as earth electrodes

Country	Clause N°	Wording
PL	542.2.3	In Poland, it is permitted to use a water pipe system as earth electrodes, but only with the consent of the water distributor.
NL	542.2.3	In the Netherlands, water pipes are not permitted as earth electrodes.
SL	542.2.3	In Slovenia, water pipes are not permitted as earth electrodes.
NO	542.2.3	In Norway, metallic pipelines are not permitted as earth electrodes.
DK	542.2.3	In Denmark, waterpipes are not permitted as earth electrodes.
DE	542.2.3	In Germany the first dash together with the note is deleted and replaced by: concrete-embedded foundation earth electrode according to the National Standard DIN 18014;
DK	542.2.4	In Denmark where possible the earth electrode shall be installed at a depth of at least 2 m.
DE	542.2.5	In Germany, for external conductors (e.g. LPS down conductors) which are connected to the foundation earth, these connections made of hot galvanized steels shall not be buried in soil, except joints with plastic-cover or of stainless steel according No: 1.4571 are used for durable insulation (according to European certified reference material CRM 284-2 EN 10020)
CH	542.3.1	In Switzerland, the minimal cross-section of the earthing conductor shall be not less than 16 mm ² .
IE	542.3.1	In Ireland, the minimum cross-sectional area is 10 mm ²
DK	542.3.1	In Denmark, earthing conductors buried in the soil shall be at a depth of at least 0,35 m.
NL	542.3.1	In the Netherlands, a single interruption in a protective conductor used for more than one installation shall not lead to a touch voltage that does not comply with Clause 411.
NO	542.3.1	In Norway, earthing conductors laid in the ground shall be at least 25 mm ² Cu or 50 mm ² corrosion protected Fe. Joints and/or connections shall be protected against corrosion.
SL	542.3.2	In Slovenia the connection of an earthing conductor to an earth electrode shall be soundly made also with screws, not smaller than M10.
NL	542.3.2	In the Netherlands, earthing conductors embedded in the soil shall be installed at a depth of at least 60 cm.
CZ	542.2.5 (after the 1 st para.)	In the Czech Republic, copper or copper-sheathed earth electrodes in densely inhabited regions are permitted, provided that the corrosive influence of the copper on steel, zinc coated steel, etc. is controlled and that sacrificial protection for the elimination of macro-cell is applied.
CZ	542.2.5 (at the end of the subclause)	In the Czech Republic, the contacts of steel earth electrodes and earthing conductors, and crossovers of steel earth electrodes and earthing conductors between two different medias, are protected no matter whether they are protected in a general sense (e.g. by zinc layer) or not. The crossovers are protected by passive protection (e.g. by asphalt sealing compound, pouring resin, anticorrosive band, etc.) up to these distances: – earthing conductors when crossing into the soil at least 30 cm below the surface and 20 cm above the surface; – earthing conductors from foundation earth electrodes; – on the crossing from concrete to the soil at least 30 cm in concrete and 100 cm in the soil; – on the crossing from concrete to the surface at least 10 cm in concrete and 20 cm above the surface; – at arching over the dilatation joints – arching waist in the joint and at least 20 cm in concrete on both sides of the joint.
IE	542.3.1	In Ireland, for circuits for lighting, the minimum cross-sectional area is 1.5mm ² .
FI	542.3.1	In Finland, the minimum cross-sectional area for earthing conductors not protected against corrosion is 16 mm ² copper or 50 mm ² steel.
AT	543.1.1	In Austria replace the first and second paragraph by: The cross-sectional area of every protective conductor shall be capable of withstanding mechanical and thermal stresses caused by the prospective fault current for the expected duration.