

**Üle 1 kV nimivahelduvpingega tugevvoolupaigaldiste  
maandamine**

**Earthing of power installations exceeding 1 kV a.c.**

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## EESTI STANDARDI EESSÕNA

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English version

## **Earthing of power installations exceeding 1 kV a.c.**

Prises de terre des installations électriques en courant alternatif de puissance supérieure à 1 kV

Erdung von Starkstromanlagen mit Nennwechselspannungen über 1 kV

This European Standard was approved by CENELEC on 2010-11-01. 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.

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# **CENELEC**

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

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## Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 99X, Power installations exceeding 1 kV a.c. (1,5 kV d.c.). It was submitted to formal vote and was accepted by CENELEC as EN 50522 on 2010-11-01.

Together with EN 61936-1:2010 this document supersedes HD 637 S1:1999.

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

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) 2011-11-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2013-11-01

NOTE *The text identical with IEC 61936-1 is written in italics.*

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## Contents

1	Scope .....	6
2	Normative references .....	7
3	Terms and definitions .....	8
3.1	General definitions .....	8
3.2	Definitions concerning installations .....	8
3.3	Definitions concerning safety measures against electric shock .....	9
3.4	Definitions concerning earthing .....	9
4	Fundamental requirements .....	18
4.1	<i>General requirements</i> .....	18
4.2	<i>Electrical requirements</i> .....	18
4.3	<i>Safety criteria</i> .....	19
4.4	<i>Functional requirements</i> .....	20
5	<i>Design of earthing systems</i> .....	20
5.1	General .....	20
5.2	Dimensioning with respect to corrosion and mechanical strength .....	20
5.3	Dimensioning with respect to thermal strength .....	21
5.4	Dimensioning with regard to touch voltages .....	23
6	Measures to avoid transferred potential .....	27
6.1	<i>Transferred potential from High voltage systems to Low voltage systems</i> .....	27
6.2	Transferred potentials to telecommunication and other systems .....	28
7	Construction of earthing systems .....	29
7.1	Installation of earth electrodes and earthing conductors .....	29
7.2	Lightning and transients .....	29
7.3	Measures for earthing on equipment and installations .....	30
8	<i>Measurements</i> .....	30
9	<i>Maintainability</i> .....	30
9.1	<i>Inspections</i> .....	30
9.2	<i>Measurements</i> .....	30
	<b>Annex A (normative) Method of calculating permissible touch voltages</b> .....	31
	<b>Annex B (normative) Touch voltage and body current</b> .....	32
B.1	Calculation of permissible touch voltage .....	32
B.2	Calculation of prospective permissible touch voltage .....	33
	<b>Annex C (normative) Type and minimum dimensions of earth electrode materials ensuring mechanical strength and corrosion resistance</b> .....	36
	<b>Annex D (normative) Current rating calculation of earthing conductors and earth electrodes</b> .....	37
	<b>Annex E (normative) Description of the recognized specified measures M</b> .....	41
	<b>Annex F (normative) Measures on earthing systems to reduce the effects of high frequency interference</b> .....	44
	<b>Annex G (normative) Detailed measures for earthing of equipment and installations</b> .....	45
G.1	Fences around substation installations .....	45
G.2	Pipes .....	45
G.3	Traction rails .....	45
G.4	Pole mounted transforming and/or switching installations .....	45
G.5	Secondary circuits of instrument transformers .....	46

<b>Annex H (normative) Measuring touch voltages</b> .....	47
<b>Annex I (informative) Reduction factors related to earth wires of overhead lines and metal sheaths of underground cables</b> .....	48
I.1 General .....	48
I.2 Typical values of reduction factors of overhead lines and cables (50 Hz) .....	48
<b>Annex J (informative) Basis for the design of earthing systems</b> .....	50
J.1 Soil resistivity.....	50
J.2 Resistance to earth .....	50
<b>Annex K (informative) Installing the earth electrodes and earthing conductors</b> .....	54
K.1 Installation of earth electrodes.....	54
K.2 Installation of earthing conductors .....	54
<b>Annex L (informative) Measurements for and on earthing systems</b> .....	56
L.1 Measurement of soil resistivities .....	56
L.2 Measurement of resistances to earth and impedances to earth.....	56
L.3 Determination of the earth potential rise .....	57
L.4 Elimination of interference and disturbance voltages for earthing measurements .....	58
<b>Annex M (normative) Details on site inspection and documentation of earthing systems</b> .....	61
<b>Annex N (informative) The use of reinforcing bars in concrete for earthing purpose</b> .....	62
<b>Annex O (informative) Global Earthing System</b> .....	63
<b>Annex P (normative) Special national conditions</b> .....	64
<b>Annex Q (informative) A-deviations</b> .....	65
Figure 1 - Example for the surface potential profile and for the voltages in case of current carrying earth electrodes.....	14
Figure 2 - Example for currents, voltages and resistances for an earth fault in a transformer substation with low impedance neutral earthing .....	15
Figure 3 - Essential components of earth fault currents in high voltage systems .....	17
Figure 4 - Permissible touch voltage .....	25
Figure 5 - Design of earthing systems, if not part of a global earthing system (C1 of 5.4.2), with regard to permissible touch voltage $U_{Tp}$ by checking the earth potential rise $U_E$ or the touch voltage $U_T$ .....	26
Figure B.1 - Scheme of the touching circuit.....	34
Figure B.2 - Examples for curves $U_{VTP} = f(t_f)$ for different additional resistances $R_F = R_{F1} + R_{F2}$ .....	35
Figure D.1 - Short circuit current density $G$ for earthing conductors and earth electrodes relative to the duration of the fault current $t_f$ .....	38
Figure D.2 - Continuous current $I_D$ for earthing conductors.....	40
Figure J.1 - Resistance to earth of horizontal earth electrodes (made from strip, round material or stranded conductor) for straight or ring arrangement in homogeneous soil.....	51
Figure J.2 - Resistance to earth of earth rods, vertically buried in homogeneous soil .....	52
Figure J.3 - Typical values for the resistance to earth of a cable with earth electrode effect depending on the length of the cable and the soil resistivity.....	53
Figure L.1 - Example for the determination of the impedance to earth by the heavy-current injection method.....	60

Table 1 - Relevant currents for the design of earthing systems .....	22
Table 2 - Minimum requirements for interconnection of low voltage and high voltage earthing systems based on EPR limits .....	28
Table B.1 - Permissible body current $I_B$ depending on the fault duration $t_f$ .....	32
Table B.2 - Total human body impedance $Z_B$ related to the touch voltage $U_T$ for a current path hand to hand.....	32
Table B.3 - Calculated values of the permissible touch voltage $U_{Tp}$ as a function of the fault duration $t_f$ .....	33
Table B.4 - Assumption for calculations with additional resistances .....	33
Table D.1 - Material constants.....	37
Table D.2 - Factors for conversion of continuous current from 300 °C final temperature to another final temperature.....	38
Table E.1 - Conditions for the use of recognized specified measures M to ensure permissible touch voltages $U_{Tp}$ (see Figure 4).....	41
Table J.1 - Soil resistivities for frequencies of alternating currents (Range of values, which were frequently measured).....	50

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## 1 Scope

This European Standard is applicable to specify the requirements for the design and erection of earthing systems of electrical installations, in systems with nominal voltage above 1 kV a.c. and nominal frequency up to and including 60 Hz, so as to provide safety and proper functioning for the use intended.

For the purpose of interpreting this standard, an electrical power installation is considered to be one of the following:

- a) substation, including substation for railway power supply;
- b) electrical installations on mast, pole and tower;  
switchgear and/or transformers located outside a closed electrical operating area;
- c) one (or more) power station(s) located on a single site;  
the installation includes generators and transformers with all associated switchgear and all electrical auxiliary systems. Connections between generating stations located on different sites are excluded;
- d) the electrical system of a factory, industrial plant or other industrial, agricultural, commercial or public premises.

The electrical power installation includes, among others, the following equipment:

- rotating electrical machines;
- switchgear;
- transformers and reactors;
- converters;
- cables;
- wiring systems;
- batteries;
- capacitors;
- earthing systems;
- buildings and fences which are part of a closed electrical operating area;
- associated protection, control and auxiliary systems;
- large air core reactor.

NOTE In general, a standard for an item of equipment takes precedence over this standard.

This European Standard does not apply to the design and erection of earthing systems of any of the following:

- overhead and underground lines between separate installations;
- electric railways;
- mining equipment and installations;
- fluorescent lamp installations;
- installations on ships and off-shore installations;
- electrostatic equipment (e.g. electrostatic precipitators, spray-painting units);
- test sites;
- medical equipment, e.g. medical X-ray equipment.

This European Standard does not apply to the requirements for carrying out live working on electrical installations.



## 2 Normative references

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.

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

EN 60909, *Short-circuit currents in three-phase a.c. systems* (IEC 60909)

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

HD 60364-4-41, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock* (IEC 60364-4-41, modified)

IEC 60050(151):2001, *International Electrotechnical Vocabulary (IEV) – Part 151: Electrical and magnetic devices*

IEC 60050(195):1998, *International Electrotechnical Vocabulary (IEV) – Part 195: Earthing and protection against electric shock*

IEC 60050(601):1985, *International Electrotechnical Vocabulary (IEV) – Part 601: Generation, transmission and distribution of electricity – General*

IEC 60050(602):1983, *International Electrotechnical Vocabulary (IEV) – Part 602: Generation, transmission and distribution of electricity – Generation*

IEC 60050(604):1987, *International Electrotechnical Vocabulary (IEV) – Part 604: Generation, transmission and distribution of electricity – Operation*

IEC 60050(605):1983, *International Electrotechnical Vocabulary (IEV) – Part 605: Generation, transmission and distribution of electricity – Substations*

IEC 60050(826):2004, *International Electrotechnical Vocabulary (IEV) – Part 826: Electrical installations*

IEC 60287-3-1, *Electric cables – Calculation of the current rating – Part 3-1: Sections on operating conditions – Reference operating conditions and selection of cable type*

IEC/TS 60479-1:2005, *Effects of current on human beings and livestock – Part 1: General aspects*

IEC 60949:1988, *Calculation of thermally permissible short-circuit currents, taking into account non-adiabatic heating effects*

IEC/TS 61000-5-2, *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines – Section 2: Earthing and cabling*