SLOVENSKI STANDARD
SIST HD 60364-5-52:2011

01-maj-2011

Nadomešča:
SIST HD 384.5.52 S1:2000
SIST HD 384.5.52 S1:2000/A1:2000
SIST HD 384.5.523 S2:2002

Nizkonapetostne električne inštalacije - 5-52. del: Izbira in namestitev električne opreme - Inštalacijski sistemi

Low-voltage electrical installations -- Part 5-52: Selection and erection of electrical equipment - Wiring systems

Installations électriques à basse-tension -- Partie 5-52: Choix et mise en oeuvre des matériels électriques - Canalisations

Ta slovenski standard je istoveten z: **HD 60364-5-52:2011**

ICS:

91.140.50 Sistemi za oskrbo z elektriko Electricity supply systems

SIST HD 60364-5-52:2011 **en**

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

HD 60364-5-52

February 2011

ICS 13.260; 91.140.50

Supersedes HD 384.5.52 S1:1995 + A1:1998 + corr. Sep.1998, HD 384.5.523 S2:2001

English version

Low-voltage electrical installations - Part 5-52: Selection and erection of electrical equipment - Wiring systems

(IEC 60364-5-52:2009, modified + corrigendum Feb. 2011)

Installations électriques à basse-tension - Partie 5-52: Choix et mise en oeuvre des matériels électriques - Canalisations
(CEI 60364-5-52:2009, modifiée + corrigendum Feb. 2011)

Errichten von Niederspannungsanlagen - Teil 5-52: Auswahl und Errichtung elektrischer Betriebsmittel - Kabel- und Leitungsanlagen
(IEC 60364-5-52:2009, modifiziert + corrigendum Feb. 2011)

This Harmonization Document was approved by CENELEC on 2011-01-24. 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

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Ref. No. HD 60364-5-52:2011 E

Foreword

The text of the International Standard IEC 60364-5-52:2009, prepared by IEC TC 64, Electrical installations and protection against electric shock, together with common modifications prepared by the Technical Committee CENELEC TC 64, Electrical installations and protection against electric shock, was submitted to the formal vote and was approved by CENELEC as HD 60364-5-52 on 2011-01-24.

This European Standard supersedes HD 384.5.52 S1:1995 + A1:1998 and HD 384.5.523 S2:2001.

The main changes with respect to HD 384.5.52 S1:1995 + A1:1998 are as follows:

– Subclause 521.4 introduces minor changes with regard to busbar trunking systems and powertrack systems.

– Subclause 523.6 introduces minor changes with regard to the sizing of cables where harmonic currents are present.

– A new sublause 523.9 concerning single-core cables with a metallic covering has been introduced.

– Clause 525 introduces changes in the maximum value of voltage drop permitted between the origin of the consumer's installation and the equipment which should not be greater than that given in the relevant annex.

– Clause 526 introduces minor changes to electrical connections including additional exceptions for inspection of connections and additional notes.

– Clause 528 introduces additional requirements with regard to proximity of underground power and telecommunication cables.

– Clause 529 introduces minor changes to selection and erection of wiring systems in relation to maintainability, including cleaning.

The following dates were fixed:

– latest date by which the existence of the HD has to be announced at national level	(doa)	2011-07-24
– latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement	(dop)	2012-01-24
– latest date by which the national standards conflicting with the HD have to be withdrawn	(dow)	2014-01-24

Endorsement notice

The text of the International Standard IEC 60364-5-52:2009 was approved by CENELEC as a Harmonization Document with agreed common modifications as given below.

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

IEC 60332-3 series	NOTE Harmonized in EN 60332-3 series (partially modified).
IEC 60332-3-24	NOTE Harmonized as EN 60332-3-24.
IEC 60364-4-43:2008	NOTE Harmonized as HD 60364-4-43:2010 (modified).
IEC 60364-5-51:2005	NOTE Harmonized as HD 60364-5-51:2009 (modified).
IEC 60364-7-715	NOTE Harmonized as HD 60364-7-715.

IEC 61000 series	NOTE Harmonized in EN 61000 series (partially modified).
IEC 61386-24	NOTE Harmonized as EN 61386-24.
IEC 61535	NOTE Harmonized as EN 61535.
IEC 62305 series	NOTE Harmonized in EN 62305 series (partially modified).

COMMON MODIFICATIONS

521.9.1

Add the following note:

NOTE Insulated flexible conductors or cores according to HD 516 may also be used as fixed installation.

528.2

Add the following new paragraph:

"In the case of proximity between cable distribution systems for radio and television signals and power line systems, EN 50083 should be considered."

528.2

Add the following note:

NOTE For the connection of combined socket-outlets for telecommunication (also aerial) and power line systems, EN 41003 should be considered.

Annex A - Table A.52.2 – Erection of wiring systems

Delete Table A.52.2.

Annex B - Table B52-18 – Current-carrying capacities

Table B.52.18, right column, line Number of circuits 16, change from 0.38 to 0.68.

Annex D - Formulae to express current-carrying capacities

Delete Annex D.

Add Annexes ZA to ZC below.

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.

Publication	Year	Title	EN/HD	Year
IEC 60228	-	Conductors of insulated cables	EN 60228	-
IEC 60287	Series	Electric cables - Calculation of the current rating	-	-
IEC 60287-2-1	-	Electric cables - Calculation of the current rating - Part 2-1: Thermal resistance - Calculation of thermal resistance	-	-
IEC 60287-3-1	-	Electric cables - Calculation of the current rating - Part 3: Sections on operating conditions - Section 1: Reference operating conditions and selection of cable type	-	-
IEC 60332-1-1	-	Tests on electric and optical fibre cables under fire conditions - Part 1-1: Test for vertical flame propagation for a single insulated wire or cable - Apparatus	EN 60332-1-1	-
IEC 60332-1-2	-	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame	EN 60332-1-2	-
IEC 60364-1 (mod)	2005	Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions	HD 60364-1	2008
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 60364-4-42	-	Low voltage electrical installations - Part 4-42: Protection for safety - Protection against thermal effects	HD 60364-4-42	-
IEC 60364-5-54 (mod)	-	Electrical installations of buildings - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements, protective conductors and protective bonding conductors	HD 60364-5-54	-

Publication	Year	Title	EN/HD	Year
IEC 60439-2	-	Low-voltage switchgear and controlgear assemblies - Part 2: Particular requirements for busbar trunking systems (busways)	EN 60439-2	-
IEC 60449	-	Voltage bands for electrical installations of buildings	HD 193 S2	-
IEC 60502	Series	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV)	-	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 60570 (mod)	-	Electrical supply track systems for luminaires	EN 60570	-
IEC 60702	Series	Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V	EN 60702	-
IEC 60947-7	Series	Low-voltage switchgear and controlgear - Part 7: Ancillary equipment	EN 60947-7	Series
IEC 60998	Series	Connecting devices for low-voltage circuits for household and similar purposes	EN 60998	Series
IEC 61084	Series	Cable trunking and ducting systems for electrical installations	-	-
IEC 61386	Series	Conduit systems for cable management	EN 61386	Series
IEC 61534	Series	Powertrack systems	EN 61534	Series
IEC 61537	-	Cable management - Cable tray systems and cable ladder systems	EN 61537	-
ISO 834	Series	Fire-resistance tests - Elements of building construction	-	-

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	Special national condition
Norway	523.1	In Norway the following additional requirements apply: Special requirement may apply in Norway due to national building practice and the extended use of insulation materials in building walls.
Germany	521.11	In Germany additional requirements apply (**see annex** to German Special National Condition on Clause 521.x)
	521.12	In Germany the following additional requirements apply: "521.x Inherently short-circuit proof and inherently earth-fault-proof wiring Where protective devices for the protection in case of short-circuit in accordance with 473.2.2.1 of IEC 60364 are not used, cables and conductors shall be laid inherently short-circuit proof and inherently earth-fault-proof. The following types of wiring are regarded as inherently short-circuit proof and inherently earth-fault proof: a) Conductor arrangements where contact between the conductors and contact with earthed parts are prevented and where no short-circuit is to be expected due to external influences (e.g. falling parts); b) Arrangement consisting of single-core cables, e.g. in accordance with IEC 60502, single-core non-metallic -sheathed cables in accordance with IEC 60227-4 or single-core rubber-insulated and sheathed flexible cables in accordance with IEC 60245-4; c) Cables and rubber-insulated and sheathed flexible cables laid so that they are accessible but not in the vicinity of combustible materials and where the risk of mechanical damage is prevented. d) Conductor arrangement consisting of single-core non-sheathed cables of suitable type of construction (e.g. special rubber-insulated cables in accordance with IEC 60XXX [1)], rated voltage U_0/U at least 1,8/3 kV or equivalent). An arrangement of cables and insulated conductors which could burn out without endangering their environment (e.g. cables in ground) is considered as equivalent to inherently short-circuit proof and inherently earth-fault-proof wiring with regard to safety."

1) In preparation.

Country	Clause	Special national condition
	521.13	In Germany the following additional requirements apply: "521.13 Accessories Boxes and enclosures for accessories, e.g. connecting boxes for housing terminals, socket-outlets or switches shall comply with the requirements of EN 60670. Boxes and enclosures intended to be installed in concrete or in hollow walls, shall have the following markings according to EN 60670-1 on the boxes and enclosures or provided by the manufacturer on the smallest package unit or in the instructions of the manufacturer - for use in concrete: symbol 90 °C; - for use in hollow walls: symbol H. GP-enclosures according to EN 60670-24 (under preparation) are not allowed to be installed in Germany. Socket outlet-systems which accept the simultaneous connection of more than one plug in the interface of one socket outlet are not allowed in Germany.
	521.6	In Germany and the Netherlands in the case of basic-insulated conductors in conduit systems, cable trunking systems and cable ducting systems, only the conductors of one main circuit, including the auxiliary circuits associated with this main circuit, may be laid in conduit or in single-channel trunking or in one duct of a multi-channel trunking, except in electrical and enclosed operating areas. The uncut conductors of several circuits may, however, be fed through common through-run boxes.

Country	Clause	Special national condition
	521.7	In Germany the following additional requirements are applicable: under certain circumstances, for ease of installation, the conductor may be Class 5 to EN 60228, in which case the designatory suffix under HD 361 is given by "-K". The use of a Class 5 conductor designated "-K" does not indicate that the cable is suitable for repeated flexing. Flexible cables or cords (except for those heavy duty types used as fixed installations in temporary buildings) should not be used as fixed wiring unless contained in an enclosure affording mechanical protection, except when used as the final connection to fixed equipment. In which case they should be of, at least, the 'ordinary' type. Flexible cables or cords should not be placed under carpets or other floor coverings, where there is a) any risk of thermal insulating effects, leading to excessive temperature rise (see 5.3.1, a)); b) any risk of damage due to furniture or equipment resting on them or traffic passing over them. When flexible cables are required for use outdoors, whether of temporary or permanent usage, reference should be made to Table 2A and 2B of this HD to determine their suitability for such usage. PVC flexible cables or cords are unsuitable for permanent use outdoors. Neither should those that have a temporary designation be used in that manner outdoors in adverse conditions, e.g. at temperatures below those given in Table 4A, column 11. In the case of soft soldered joints or terminations the limiting temperature for the conductor under short circuit conditions is reduced to 160 °C. Account of this limitation should be taken in selecting and operating cables. Tinned copper conductors should not be used at temperatures above 200 °C because of the risk of mutual adhesion. Where the limiting temperature given in Column 10 of Tables 3A, 3B, 4A and 4B is such that the temperature of the surface of the cable is liable to exceed 50 °C, the cable should be so located or guarded as to prevent contact of persons or animals therewith. Cable surface temperatures above this can cause involuntary reaction in the event of contact with exposed skin. Account should be taken of these possibilities in the selection and use of cables.
	527	In Germany, in cable tunnels, cable ducting and other places with increased density of installed cables the installation of fire detectors sensitive to heat radiation and smoke is required. In extended wiring system installations the possibility to use mobile fire extinguishers is required. The use of a stationery fire extinguisher installation is recommended in case of extended wiring systems to which gaining access is difficult. In cable tunnels every 100 m a partition as fire resisting section should be provided and every cable breaking through should be sealed by a suitable and agreed fire resisting provision. Accessible cable tunnels and ducts shall be erected with a sufficient number of possibilities for gaining access in case of fighting a fire hazard, e.g. by easy removable covers, and devices for smoke removal shall be provided. Where fire protection seals with an automatic closing function and fire resisting capability are applied such seals shall be activated at once in case of a fire hazard.

Country	Clause	Special national condition
	522.4.1	In Germany, in hollow wall installations boxes and enclosures with a protection degree not less than IP30 shall be used.
	522.8.1.1	In Germany the following additional requirements apply: Add the following text: The tension applied to a cable should not exceed the values of tensile stress per conductor given below. This is subject to a total maximum tensile force of 1 000 N unless otherwise agreed by the cable manufacturer. 50 N/mm² for non flexible cables during installation. 15 N/mm² for flexible cables, under static tensile stress and for non flexible cables in service in fixed circuits. In circumstances where a stress exceeding the above values would result, a separate stress bearing member or device should be used. The method of attaching such a member or device to the cable should be such that the cable is not damaged. In circumstances where flexible cables are under dynamic stress (including those due to inertia, e.g. reeling drums) the permissible tensions or fatigue life should be agreed between the design engineer and the cable manufacturer. Cables which are installed vertically, without intermediate support, which are inaccessible and unlikely to be moved or disturbed, should be supported at the top of the run such that the internal radius of the resultant bend is not less than the appropriate minimum bending radius for normal use according to Table 6(a), or for fixed installation according to Tables 6(b) and 6(c). The unsupported vertical length of such runs should not exceed 5 m. The rated voltage of a cable is the reference voltage for which the cable is designed and which serves to define the electrical tests. The rated voltage is expressed by the combination of two values U_o/U, expressed in volts: U_o being the r.m.s. value between any insulated conductor and 'earth' (metal covering of the cable or the surrounding medium); U being the r.m.s. value between any two phase conductors of a multicore cable or of a system of single core cables. In an alternating current system, the rated voltage of a cable shall be at least equal to the nominal voltage of the system for which it is intended. This condition applies both to the value U_o and to the value U. In a direct current system, the nominal voltage of the system shall be not higher than 1,5 times the rated voltage of the cable. NOTE The operating voltage of a system may permanently exceed the nominal voltage of such a system by 10 %.
	522.8.8	In Germany the standards DIN 18015-3 and DIN 1053-1 have to be considered.

Country	Clause	Special national condition
	522.8.9	In Germany, in hollow wall installations boxes and enclosures with cable retention shall be used
	522.8.10	In Germany the following additional requirements apply: “Cable laid in the ground shall be laid at least at 0,6 m below ground level but at least 0,8 m below the carriageway of streets. For smaller installation depths the cable shall be protected by other means, e.g. wiring in suitable conduits."
	523.3	In Germany in addition the 24 h load diagram has to be taken into consideration
	527	In Germany there are specific requirements on fire protection in some areas.
	527.2.4	In Germany 527.2.4 is not applicable.
	527.2.5	In Germany, seals for cable penetrations shall be approved by the German Institute for constructional engineering (Deutsches Institut für Bautechnik DIBT).
	Annex A Table A.52.3	In Germany additional requirements apply (**see annex** to German Special National Condition on Table A52-3)
	Annex D	In Germany Annex D does not apply.

Country	Clause	Special national condition
		In Germany the following additional requirements apply: A) Wiring in concrete; B) 1 cable and conductor. The cables and conductors listed under a) to c) are permissible. a) Aderleitungen single-core conductors, e.g. H07V…, in conduit. The conduit for feeding through or joining single-core conductors, e.g. at the intersection of wall and ceiling structural elements, shall be fed through in insulating boxes according to DIN EN 60670 (VDE 0606)-series (some countries note and SNC in CENELEC). When using single-core cable it shall be ensured that the conduit and boxes form an unbroken sealed system. b) Sheathed conductors, e.g. NYM, according to DIN VDE 0250-204 (VDE 0250-204); in conduit or recess clearances. c) Cables, e.g. NYY, according to DIN VDE 0276-603 (VDE 0276-603). C) 2 Accessories Boxes for appliances, appliance connection boxes, luminaire connection boxes and junction boxes shall be suitable for installation in concrete. They shall comply with DIN EN 60670 (VDE 0606) and shall be marked with the symbol B according to DIN 30600 Reg. No. 1716. D) Installation of cables in not accessible underground ducts and in protective conduits burried in the ground In not accessible underground ducts outside of buildings only cable or rubber-sheathed cable NSSHÖU according to DIN VDE 0250-812 (VDE 0250-812), trailing cables according to DIN VDE 0250-813 (VDE 0250-813) or similar types shall be installed. In protective conduits burried in the ground also sheathed conductors NYM according to DIN VDE 0250-204 “(VDE 250-204) and plain lead-covered cable DIN VDE 0250-210 (VDE 0250-210) are allowed, if the cables remain accessible and exchangeable and the conduit is mechanically fixed, protected against the ingress of water and ventilated. NOTE This type of wiring should be restricted to exceptional cases and short distances, e.g. up to 5 m; the type of wiring according to 522.8.10 should be given preference.

Country	Clause	Special national condition
	Annex ZB	In Germany the following additional requirements apply: “Flat webbed house wires in accordance with DIN VDE 0250, Part 201 may be used if the following requirements are met: a) Flat webbed house wires according to DIN VDE 0250, Part 201 (NYIF. NYIFY) may only be installed in dry rooms and only in or under plaster. They shall be covered with plaster along their entire length. NOTE 1 The use of flat webbed house wires may be restricted in special specifications. NOTE 2 The insulation of cores in flat conductors is about half as thick as the insulation of single-core conductors. The covering is primarily intended to maintain the distances between the cores in order to ensure the permissible heat removal based on the maximum carrying current and the additional mechanical protection of the conductor by the plaster covering. In general, this is ensured by a crack-resistant plaster covering with a plaster thickness of about 4 mm. b) If flat webbed house wires are installed in cavities in ceilings or walls consisting of concrete, stone or similar non-combustible material, it is not necessary to cover them with plaster in accordance with item a). c) Even when covered with plaster, flat webbed house wires may not be laid on combustible construction materials (see DIN 4102, Part 1), e.g. wood. d) Flat webbed house wires shall not be bunched. Collecting flat webbed house wires together at the inlet points of electrical equipment, e.g. distribution boards, is not considered as bunching. e) Flat webbed house wires may only be fixed using means and methods which will ensure that the insulation is not damaged or deformed. NOTE 3 Means for fixing without damage are, e.g. : - gypsum plaster; or - clamps matching the shape of the wires and made of insulating material or of metal with insulating layer; or - sticking; or - nailing with suitable nails with insulating washers. f) Flat webbed house wires shall not be installed under plaster board unless these boards are attached entirely with plaster. g) Flat webbed house wires shall not be installed immediately on or under wire netting, metal mesh or similar. h) Flat webbed house wires may only be joined in installation boxes in accordance with DIN EN 60670-1 (VDE 0606-1) made of insulating material.
Netherlands	521.6	In Netherlands in the case of basic-insulated conductors in conduit systems, cable trunking systems and cable ducting systems, only the conductors of one main circuit, including the auxiliary circuits associated with this main circuit, may be laid in conduit or in single-channel trunking or in one duct of a multi-channel trunking, except in electrical and enclosed operating areas. The uncut conductors of several circuits may, however, be fed through common through-run boxes.

Country	Clause	Special national condition
Ireland	522.6.2	In Ireland concealed wiring must be protected against damage caused by penetration by fixings and drills, by earthed metal enclosures or integral screens, except in the following areas: 150 mm horizontally from a corner, 150 mm vertically from a ceiling, straight vertical or horizontal run to a point, accessory or switchgear. In such cases, the wiring must be at least 50 mm from the reverse side of the wall.