SLOVENSKI STANDARD
SIST HD 60364-5-534:2016

01-april-2016

Nadomešča:
SIST HD 60364-5-534:2008

Nizkonapetostne električne inštalacije - 5-53. del: Izbira in namestitev električne opreme - Ločevanje, stikanje in krmiljenje - 534. točka: Naprave za prenapetostno zaščito

Low-voltage electrical installations - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control - Clause 534: Devices for protection against overvoltages

Installations électriques à basse tension - Partie 5-53: Choix et mise en oeuvre des matériels électriques - Sectionnement, coupure et commande - Article 534: Dispositifs pour la protection contre les surtensions

Ta slovenski standard je istoveten z: HD 60364-5-534:2016

ICS:

29.120.99	Druga električna dodatna oprema	Other electrical accessories
91.140.50	Sistemi za oskrbo z elektriko	Electricity supply systems

SIST HD 60364-5-534:2016 en

HARMONIZATION DOCUMENT
DOCUMENT D'HARMONISATION
HARMONISIERUNGSDOKUMENT

HD 60364-5-534

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ICS 29.130; 91.140.50

Supersedes HD 60364-5-534:2008

English Version

Low-voltage electrical installations - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control - Clause 534: Devices for protection against transient overvoltages (IEC 60364-5-53:2001/A2:2015 , modified)

Installations électriques à basse tension - Partie 5-53: Choix et mise en oeuvre des matériels électriques - Sectionnement, coupure et commande - Article 534: Dispositifs de protection contre les surtensions transitoires (IEC 60364-5-53:2001/A2:2015 , modifiée)

Errichten von Niederspannungsanlagen - Teil 5-53: Auswahl und Errichtung elektrischer Betriebsmittel - Trennen, Schalten und Steuern - Abschnitt 534: Überspannung-Schutzeinrichtungen (ÜSE) (IEC 60364-5-53:2001/A2:2015 , modifiziert)

This Harmonization Document was approved by CENELEC on 2015-12-14. 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 CEN-CENELEC Management Centre 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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

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European foreword

The text of document 64/2031/FDIS, future IEC 60364-5-53:2001/A2 prepared by IEC/TC 64 “Electrical installations and protection against electric shock” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as HD 60364-5-534:2016.

A draft amendment, which covers common modifications to IEC 60364-5-53:2001/A2:2015 (64/2031/FDIS), was prepared by CLC/TC 64 “Electrical installations and protection against electric shock” and approved by CENELEC.

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) 2016-12-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-12-14

HD 60364-5-534:2016 supersedes HD 60364-5-534:2008.

HD 60364-5-534:2016 includes the following significant technical changes with respect to the previous edition: this document constitutes a complete structural and technical revision of HD 60364-5-534:2008. The most significant technical change refers to the selection requirements for the voltage protection level.

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

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60364-5-53:2001/A2:2015 are prefixed “Z”.

Endorsement notice

The text of the International Standard IEC 60364-5-53:2001/A2:2015 was approved by CENELEC as a Harmonization Document with agreed common modifications.

COMMON MODIFICATIONS

530.2 Normative references

Replace *the text of 530.2 by the following:*

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.

EN 60038, *CENELEC standard voltages (IEC 60038)*

HD 60364-4-41:2007 + corr. Jul. 2007, *Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock (IEC 60364-4-41:2005, mod.)*

HD 60364-4-43:2010, *Low-voltage electrical installations - Part 4-43: Protection for safety - Protection against overcurrent (IEC 60364-4-43:2008, mod. + corr. Oct. 2008)*

HD 60364-4-443:2016, *Low-voltage electrical installations - Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances - Clause 443: Protection against transient overvoltages of atmospheric origin or due to switching (IEC 60364-4-44:2007/A1:2015, mod.)*

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

EN 60664-1:2007, *Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests (IEC 60664-1:2007)*

EN 61643-11:2012, *Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods (IEC 61643-11:2011, mod.)*

CLC/TS 61643-12, *Low-voltage surge protective devices - Part 12: Surge protective devices connected to low-voltage power distribution systems - Selection and application principles (IEC 61643-12)*

EN 62305-1, *Protection against lightning - Part 1: General principles (IEC 62305-1)*

EN 62305-2, *Protection against lightning - Part 2: Risk management (IEC 62305-2)*

EN 62305-4, *Protection against lightning - Part 4: Electrical and electronic systems within structures (IEC 62305-4)*

IEC/TR 60664-2-1:2011, *Insulation coordination for equipment within low-voltage systems - Part 2-1: Application guide - Explanation of the application of the IEC 60664 series, dimensioning examples and dielectric testing*

530.3 Terms and definitions

Add *Clause 530.3 "Terms and definitions" as follows:*

530.3 Terms and definitions

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

530.3.101
SPD assembly
one SPD or a set of SPDs, in both cases including all SPD disconnectors required by the SPD manufacturer, providing the required overvoltage protection for a type of system earthing

530.3.102
SPD disconnector
disconnector
device for disconnecting an SPD, or part of an SPD, from the power system

Note 1 to entry: This disconnecting device is not required to have isolating capability for safety purposes. It is to prevent a persistent fault on the system and is used to give an indication of an SPD's failure. Disconnectors can be internal (built in) or external (required by the manufacturer). There may be more than one disconnector function, for example, an over-current protection function and a thermal protection function. These functions may be in separate units.

[SOURCE: IEC 61643-11:2011, 3.1.28]

530.3.103
mode of protection of an SPD
intended current path, between terminals that contains protective components, e.g. line-to-line, line-to-earth, line-to-neutral, neutral-to-earth

[SOURCE: IEC 61643-11:2011, 3.1.8]

530.3.104
follow current interrupt rating
I_{fi}
prospective short-circuit current that an SPD is able to interrupt without operation of a disconnector

[SOURCE: IEC 61643-11:2011, 3.1.39]

530.3.105
short-circuit current rating
I_{SCCR}
maximum prospective short-circuit current from the power system for which the SPD, in conjunction with the disconnector specified, is rated

[SOURCE: IEC 61643-11:2011, 3.1.27]

530.3.106
voltage protection level
U_P
maximum voltage to be expected at the SPD terminals due to an impulse stress with defined voltage steepness and an impulse stress with a discharge current with given amplitude and waveshape

Note 1 to entry: The voltage protection level is given by the manufacturer and may not be exceeded by:

– the measured limiting voltage determined for front-of-wave sparkover (if applicable) and the measured limiting voltage determined from the residual voltage measurements at amplitudes corresponding to I_n and/or I_{imp} respectively for test classes II and/or I;

– the measured limiting voltage at the open circuit voltage (U_{OC}) of the combination wave generator, determined for the combination wave for test class III.

Note 2 to entry: Information on the correlation between SPD Types and test classes according to the product standard is provided in Annex C.

[SOURCE: IEC 61643-11:2011, 3.1.14, mod. — Note 1 to entry is modified and Note 2 to entry is added.]

530.3.107
rated impulse voltage
U_W
impulse withstand voltage value assigned by the manufacturer to the equipment or to a part of it, characterizing the specified withstand capability of its insulation against transient overvoltages

[SOURCE: IEC 60664-1:2007, 3.9.2, mod. — The abbreviation 'U_W' is added.]

530.3.108
maximum continuous operating voltage
U_C

maximum r.m.s. voltage, which may be continuously applied to the SPD's mode of protection

Note 1 to entry: The U_C value covered by this standard may exceed 1 000 V.

[SOURCE: IEC 61643-11:2011, 3.1.11]

530.3.109
nominal discharge current for class II test
I_n
crest value of the current through the SPD having a current waveshape of 8/20

Note 1 to entry: Information on the correlation between SPD Types and test classes according to the product standard is provided in Annex C.

[SOURCE: IEC 61643-11:2011, 3.1.9, mod. — Note 1 to entry is added.]

530.3.110
impulse discharge current for class I test
I_{imp}
crest value of a discharge current through the SPD with specified charge transfer Q and specified energy W/R in the specified time

Note 1 to entry: Information on the correlation between SPD Types and test classes according to the product standard is provided in Annex C.

[SOURCE: IEC 61643-11:2011, 3.1.10, mod. — Note 1 to entry is added.]

530.3.111
open circuit voltage
U_{oc}
open circuit voltage of the combination wave generator at the point of connection of the device under test

[SOURCE: IEC 61643-11:2011, 3.1.23]

530.3.112
two-port SPD
SPD having a specific series impedance connected between separate input and output connections

[SOURCE: IEC 61643-11:2011, 3.1.3]

534 Devices for protection against transient overvoltages

534.1 General

Replace *the 2 first paragraphs under 534.1 as follows:*

This clause contains provisions for the application of voltage limitation in order to obtain insulation coordination in the cases described in HD 60364-4-44, EN 60664-1, EN 62305-1, EN 62305-4 and CLC/TS 61643-12.

This clause focuses mainly on the requirements for the selection and erection of SPDs for protection against transient overvoltages where required by IEC 60364-4-44:2007, Clause 443, the EN 62305 series, or as otherwise specified.

Replace *the title of 534.4.1 and all paragraphs before NOTE 3, except NOTE 1, as follows:*

534.4.1 SPD location and type of SPD

SPDs shall at least be installed as close as possible to the origin of the installation. For protection against effects of lightning and against switching overvoltages Type 2 SPDs shall be used.

If the structure is equipped with an external lightning protection system or protection against effects of direct lightning is otherwise specified, Type 1 SPDs shall be used.

Where the structure is not equipped with an external lightning protection system and where the occurrence of direct lightning strike to the overhead lines between the last pole and the entrance of the installation is to be taken into consideration, Type 1 SPDs at or near the origin of the electrical installation may be also selected according to Annex B.

Following the product standard, the marking of the product is as follows:

– for Type 1 SPDs: either “Type 1” and/or “T1“ (T1 in a square);

– for Type 2 SPDs: either “Type 2” and/or “T2“ (T2 in a square);

– for Type 3 SPDs: either “Type 3” and/or “T3” (T3 in a square).

NOTE 2 Information on the correlation between SPD Types and test classes according to the product standard is provided in Annex C.

Additional Type 2 or Type 3 SPDs may be needed to sufficiently protect the installation according to 534.4.4.1 and shall be located downstream in the fixed electrical installation, for example in the sub-distribution boards or at socket outlets. These SPDs shall not be used without SPDs being installed at the origin of the installation and shall be coordinated with SPDs located upstream (see 534.4.4.5).

If a Type 1 SPD is not able to provide protection according to 534.4.4.2, it shall be accompanied by a coordinated Type 2 or Type 3 SPD to ensure the required voltage protection level.

Additional Type 2 SPDs or Type 3 SPDs may be needed close to sensitive equipment to sufficiently protect the equipment according to 534.4.4.2 and shall be coordinated with SPDs located upstream.

Replace *Figure 534.1 and its title as follows:*

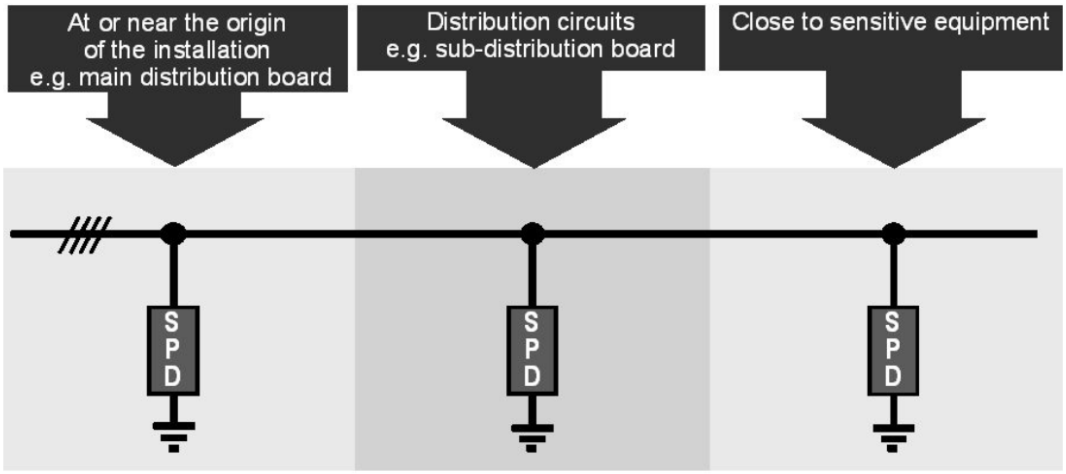

Figure 534.1 — Example of installation of Type 1, Type 2 and Type 3 SPDs

534.4.4.2 Selection of voltage protection level (U_p) as a function of equipment rated impulse voltage (U_W)

Replace *the introductory paragraph for the four indents as follows:*

This recommendation may not be considered where one of the following cases applies:

Replace *Table 534.1 as follows:*

Table 534.1 — Required rated impulse voltage of equipment (U_W)

Nominal voltage of the supply system [a] Three-phase systems	Nominal voltage of the supply system [a] Single-phase systems	Voltage line to neutral from nominal a.c. or d.c. voltages up to and including	Required rated impulse voltage [b] (U_W) of equipment	
			Overvoltage category II (equipment with normal rated impulse voltage)	Overvoltage category I (equipment with reduced rated impulse voltage)
V	V	V	kV	kV
		50	0,5	0,33
		100	0,8	0,5
	120/240	150	1,5	0,8
230/400 277/480		300	2,5	1,5
400/690		600	4	2,5
1 000		1 000	6	4
		1 500 d.c.	8 [c]	6 [c]

a According to EN 60038.

b The rated impulse voltage applies between live conductor and PE.

c Recommended values based on IEC/TR 60664–2-1:2011, Annex D.

Replace *the paragraph after Table 534.1 as follows:*

Additional SPDs between live conductors may be needed to avoid equipment malfunctions. An appropriate voltage protection level needs to be evaluated based on equipment immunity and availability requirements (see CLC/TS 61643-12).

534.4.4.4 Selection of SPDs with regard to nominal discharge current (I_n) and impulse discharge current (I_{imp})

Replace *the title of Subclause 534.4.4.4.1 and the first paragraph under as follows:*

534.4.4.4.1 Type 2 SPDs

Where Type 2 SPDs are required at or near the origin of installation, their nominal discharge current shall be not less than that given in Table 534.3.

Replace *the title of Subclause 534.4.4.4.2 and the first 2 paragraphs under as follows:*

534.4.4.4.2 Type 1 SPDs

Where Type 1 SPDs are required at or near the origin of the installation, one of the following cases applies:

a) Where no risk analysis according to EN 62305-2 has been carried out, the impulse discharge current (I_{imp}) shall be not less than as given in Table 534.4.

Replace *the indent b) as follows:*

b) Where the risk analysis according to EN 62305-2 has been carried out, the impulse discharge current (I_{imp}) shall be determined according to the EN 62305 series.

534.4.4.5 Coordination of two or several SPDs

Replace *the paragraph under 534.4.4.5 as follows:*

Coordination of SPDs in the installation needs to be ensured. The manufacturer's instructions on how to achieve coordination between SPDs shall be followed with reference CLC/TS 61643-12.

534.4.4.6 Selection of SPDs with regard to the short-circuit current rating I_{SCCR}

Replace *the second paragraph under 534.4.4.6 as follows:*

This requirement does not apply to SPDs connected between neutral conductor and PE in TN or TT systems, for which this is already covered by the product standard EN 61643-11.

534.4.4.7 Selection of SPDs with regard to the follow current interrupting rating

Replace *the second paragraph under 534.4.4.7 as follows:*

This requirement does not apply to SPDs connected between neutral conductor and PE conductor in TN or TT systems, for which this is already covered by the product standard EN 61643-11.

534.4.5.3 Selectivity between overcurrent protective devices

Replace *the first paragraph under 534.4.5.3 as follows:*

Where required, the need for selectivity between overcurrent protective devices shall be considered according to the installation conditions at the point of installation of the SPD and the information provided by the manufacturer (See HD 60364-5-53:2014, Clause 536).

534.4.6 Fault protection

Replace *the first paragraph under 534.4.6 as follows:*

Fault protection, as defined in HD 60364-4-41, shall remain effective in the protected installation even in the event of SPD failures.

Replace *the indent b) as follows:*

b) the installation of SPDs upstream of the main RCD. Because of the possibility of a failure of an SPD connected between neutral conductor and PE, the conditions of HD 60364-4-41:2007, 411.4.1, shall be met and the SPDs shall be installed in accordance with connection type CT2.

534.4.7 SPDs installation in conjunction with RCDs

Replace *NOTE 1 and the last paragraph* under *534.4.7 as follows:*

NOTE 1 S-type RCDs in accordance with EN 61008–1 and EN 61009–1 satisfy this requirement.

Installation of Type 1 SPDs downstream of an RCD is not recommended.

534.4.10 Connecting conductors of SPDs

Replace *the 2 indents after the first paragraph under 534.4.10 as follows:*

– 6 mm^2 copper or equivalent for Type 2 SPDs installed at or near the origin of the installation;

– 16 mm^2 copper or equivalent for Type 1 SPDs installed at or near the origin of the installation.

Replace *the last 2 indents as follows:*

– 2,5 mm^2 copper or equivalent for Type 2 SPDs installed at or near the origin of the installation;

– 6 mm^2 copper or equivalent for Type 1 SPDs installed at or near the origin of the installation.

Annex B
(informative)

Installations supplied by overhead lines

Replace *the first 2 paragraphs as follows:*

Where overvoltage protection according to HD 60364-4-443:2016, Clause 443, is required, where the lines entering the building are overhead and where the case of lightning strike to the last pole of the overhead lines close to the building is taking into account, SPDs at the origin of the installation shall be selected according to Table B.1.

Further information can be found in EN 62305 series.

Replace *Annex C by the following new Annex C:*

Annex C
(informative)

Correlation between SPD Types and test classes according to the product standard EN 61643-11

Table C.1 — Type 1, Type 2 and Type 3 SPDs and corresponding test classes I, II and III

Type of SPD	Test class	Reference parameter
Type 1	test class I	I_{imp}
Type 2	test class II	I_{n}
Type 3	test class III	U_{oc}

Add *Annex ZA and Annex ZB as follows:*

Annex ZA
(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 Harmonization Document.

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
534.4.1	**France**
	The following content:
	Where the structure is not equipped with an external lightning protection system and where the occurrence of direct lightning strike to the overhead lines between the last pole and the entrance of the installation is to be taken into consideration, Type 1 SPDs at or near the origin of the electrical installation may be also selected according to Annex B.
	is not applied in France.
534.4.1	**Germany**
	In Germany, where the installation of a building is supplied by overhead lines, SPDs shall be Type 1 according Annex B.
534.4.3	**Germany**
	In Germany, the restriction to a maximum distance of 0,5 m is the only requirement to be considered.
534.4.4.2	**Norway**
	In Norway, where the installation is galvanic connected to a public IT-distribution network, the minimum required U_c for a SPD located at the origin of the installations shall be at least 350 V.