SLOVENSKI STANDARD

oSIST prHD 60364-5-51:2008

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Električ ne inġtalacije zgradb - 5-51. del: Izbira in namestitev električ ne opreme - Splošna pravila

Electrical installations of buildings - Part 5-51: Selection and erection of electrical equipment - Common rules

Errichten von Niederspannungsanlagen - Teil 5-51: Auswahl und Errichtung elektrischer Betriebsmittel - Allgemeine Bestimmungen

Installations électriques des bâtiments - Partie 5-51: Choix et mise en oeuvre des matériels électriques - Regles communes

Ta slovenski standard je istoveten z: **prHD 60364-5-51:2007**

ICS:

13.260	Varstvo pred električ nim udarom	Protection against electric shock
91.140.50	Sistemi za oskrbo z električ no	Electricity supply systems

oSIST prHD 60364-5-51:2008 **en,fr,de**

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

DRAFT prHD 60364-5-51

October 2007

ICS 91.140.50;13.260

Will supersede HD 60364-5-51:2006

English version

Electrical installations of buildings - Part 5-51: Selection and erection of electrical equipment - Common rules

(IEC 60364-5-51:2005, modified)

Installations électriques des bâtiments -
Partie 5-51: Choix et mise en oeuvre des matériels électriques -
Règles communes
(CEI 60364-5-51:2005, modifiée)

Errichten von Niederspannungsanlagen -
Teil 5-51: Auswahl und Errichtung elektrischer Betriebsmittel -
Allgemeine Bestimmungen
(IEC 60364-5-51:2005, modifiziert)

This draft Harmonization Document is submitted to CENELEC members for CENELEC enquiry.
Deadline for CENELEC: 2008-02-29.

The text of this draft consists of the text of IEC 60364-5-51:2005 with common modifications prepared by CLC/SC 64B.

If this draft becomes a Harmonization Document, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

This draft Harmonization Document was established by CENELEC in three official versions (English, French, German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, 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.

Warning : This document is not a Harmonization Document. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a Harmonization Document.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

The text of the International Standard IEC 60364-5-51:2005, prepared by IEC TC 64, Electrical installations and protection against electric shock, together with the common modifications prepared by SC 64B, Electrical installations and protection against electric shock – Protection against thermal effects, of Technical Committee CENELEC TC 64, Electrical installations and protection against electric shock, is submitted to CENELEC enquiry.

This Harmonization Document will supersede HD 60364-5-51:2006.

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

Clauses, subclauses, notes, tables and figures which are additional to those in IEC 60364-5-51 are prefixed “Z”.

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Text of prHD 60364-5-51

The text of this draft Harmonization Document consists of the text of the International Standard IEC 60364-5-51:2005 with the following common modifications.

COMMON MODIFICATIONS

510 Introduction

510.1 Scope

This part of HD 60364 deals with the selection of equipment and its erection. It provides common rules for compliance with measures of protection for safety, requirements for proper functioning for intended use of the installation, and requirements appropriate to the external influences

510.2 Normative references

See Annex ZA.

510.3 General

Every item of equipment shall be selected and erected so as to allow compliance with the rules stated in the following clauses of this part of HD 60364 and the relevant rules in other parts of the HD 384/60364 series.

511 Compliance with standards

Every item of equipment shall comply with the appropriate EN or HD or national standard implementing the HD. In absence of an EN or HD, the equipment shall comply with the appropriate national standard. In other cases, based on the decisions of the National Committee, reference may be made either to IEC standards which are not approved in CENELEC or to national standards of another country. Where there are no applicable standards the item of equipment concerned shall be selected by special agreement between the person specifying the installation and the installer.

512 Operational conditions and external influences

512.1 Operational conditions

512.1.1 Voltage

Equipment shall be suitable for the nominal voltage (r.m.s. value for a.c.) of the part of the installation concerned.

If, in IT installations, the neutral conductor is distributed, equipment connected between line and neutral shall be insulated for the voltage between phases.

NOTE For certain equipment, it may be necessary to take account of the highest and/or lowest voltage likely to occur in normal service.

512.1.2 Current

Equipment shall be selected for the design current (r.m.s. value for a.c.) which it has to carry in normal service.

Equipment shall also be capable of carrying the currents likely to flow in abnormal conditions for such periods of time as are determined by the characteristics of the protective devices.

512.1.3 Frequency

If frequency has an influence on the characteristics of equipment, the rated frequency of the equipment shall correspond to the frequency of the current in the circuit concerned.

512.1.4 Power

Equipment selected for its power characteristics shall be suitable for the normal operational conditions taking account of the load factor.

512.1.5 Compatibility

Unless other suitable precautions are taken during erection, all equipment shall be selected so that it will not cause harmful effects on other equipment nor impair the supply during normal service, including switching operations.

NOTE Information on the parameters to be considered is given in Chapter 33 and Section 444.

512.1.Z1 Impulse voltage withstand

Equipment shall be selected so that its rated impulse voltage withstand is at least equal to the prospective overvoltage at the point of installation as defined in Section 443.

512.2 External influences

512.2.1 Electrical equipment shall be selected and erected in accordance with the requirements of Table 51A, which indicates the characteristics of equipment necessary according to the external influences to which the equipment may be subjected.

Equipment characteristics shall be determined either by a degree of protection or by conformity to tests.

512.2.2 If the equipment does not, by its construction, have the characteristics relevant to the external influences of its location, it may nevertheless be used on condition that it is provided with appropriate additional protection in the erection of the installation. Such protection shall not adversely affect the operation of the equipment thus protected.

512.2.3 When different external influences occur simultaneously, they may have independent or mutual effect and the degree of protection shall be provided accordingly.

512.2.4 The selection of equipment according to external influences is necessary not only for proper functioning, but also to ensure the reliability of the measures of protection for safety complying with the rules of HD 384/60364 generally. Measures of protection afforded by the construction of equipment are valid only for the given conditions of external influence if the corresponding equipment specification tests are made in these conditions of external influence.

NOTE 1 For the purpose of this standard, the following classes of external influences are conventionally regarded as normal:

AA	Ambient temperature	AA4
AB	Atmospheric humidity	AB4
Other environmental conditions (AC to AR)		XX1 of each parameter
Utilisation and construction of building (B and C)		XX1 of each parameter, except XX2 for the parameter BC

NOTE 2 The word “normal” appearing in the third column of the table signifies that the requirement must generally satisfy applicable EN standards.

Table 51A – Characteristics of external influences

Code	External influences	Characteristics required for selection and erection of equipment	Reference
A	*Environmental conditions*		
AA	Ambient temperature The ambient temperature is that of the ambient air where the equipment is to be installed. It is assumed that the ambient temperature includes the effects of other equipment installed in the same location. The ambient temperature to be considered for the equipment is the temperature at the place where the equipment is to be installed resulting from the influence of all other equipment in the same location, when operating, not taking into account the thermal contribution of the equipment to be installed. Lower and upper limits of ranges of ambient temperature:		
AA1	–60 °C +5 °C	Specially designed equipment or appropriate arrangements [a]	Includes temperature range of EN 60721-3-3, class 3K8, with high air temperature restricted to +5 °C. Part of temperature range of EN 60721-3-4, class 4K4, with low air temperature restricted to -60 °C and high air temperature restricted to +5 °C
AA2	–40 °C +5 °C		Part of temperature range of EN 60721-3-3, class 3K7, with high air temperature restricted to +5 °C. Includes part of temperature range of EN 60721-3-4, class 4K3, with high air temperature restricted to +5 °C
AA3	–25 °C +5 °C		Part of temperature range of EN 60721-3-3, class 3K6, with high air temperature restricted to +5 °C. Includes temperature range of EN 60721-3-4, class 4K1, with high air temperature restricted to +5 °C
AA4	–5 °C +40 °C	Normal (in certain cases special precautions may be necessary)	Part of the temperature range of EN 60721-3-3, class 3K5, with the high air temperatures restricted to +40 °C
AA5	+5°C +40 °C	Normal	Identical to temperature range of EN 60721-3-3, class 3K3

[a] May necessitate certain supplementary precautions (e.g. special lubrication).

[b] This means that ordinary equipment will operate safely under the described external influences.

[c] This means that special arrangements should be made, for example, between the designer of the installation and the equipment manufacturer, e.g. for specially designed equipment.

Table 51A *(continued)*

Code	External influences						Characteristics required for selection and erection of equipment	Reference
AA6	+5 °C +60 °C						Specially designed equipment or appropriate arrangements [a]	Part of temperature range of EN 60721-3-3, class 3K7, with low air temperature restricted to +5 °C and high air temperature restricted to +60 °C. Includes temperature range of EN 60721-3-4, class 4K4 with low air temperature restricted to +5 °C
AA7	–25 °C +55 °C						Specially designed equipment or appropriate arrangements [a]	Identical with temperature range of EN 60721-3-3, class 3K6
AA8	–50 °C +40 °C						Specially designed equipment or appropriate arrangements [a]	Identical with temperature range of EN 60721-3-4, class 4K3
	Ambient temperature classes are applicable only where humidity has no influence. The average temperature over a 24 h period must not exceed 5 °C below the upper limits. Combination of two ranges to define some environments may be necessary. Installations subject to temperatures outside the ranges require special consideration							
AB	*Atmospheric humidity*							
	Air temperature °C **a) low**	**b) high**	**Relative humidity** % **c) low**	**d) high**	**Absolute humidity** g/m³ **e) low**	**f) high**		
AB1	–60	+5	3	100	0,003	7	Indoor and outdoor locations with extremely low ambient temperatures. Appropriate arrangements shall be made [c]	Includes temperature range of EN 60721-3-3, class 3K8, with high air temperature restricted to +5 °C. Part of temperature range of EN 60721-3-4, class 4K4, with low air temperature restricted to -60 °C and high air temperature restricted to +5 °C
AB2	–40	+5	10	100	0,1	7	Indoor and outdoor locations with low ambient temperatures Appropriate arrangements shall be made [c]	Part of temperature range of EN 60721-3-3, class 3K7, with high temperature restricted to +5 °C. Part of temperature range of EN 60721-3-4, class 4K4, with low air temperature restricted to -60 °C and high air temperature restricted to +5 °C

[a] May necessitate certain supplementary precautions (e.g. special lubrication).

[b] This means that ordinary equipment will operate safely under the described external influences.

[c] This means that special arrangements should be made, for example, between the designer of the installation and the equipment manufacturer, e.g. for specially designed equipment.

Table 51A *(continued)*

Code	External influences						Characteristics required for selection and erection of equipment	Reference
	Air temperature °C		Relative humidity %		Absolute humidity g/m³			
	a) low	b) high	c) low	d) high	e) low	f) high		
AB3	-25	+5	10	100	0,5	7	Indoor and outdoor locations with low ambient temperatures. Appropriate arrangements shall be made [c].	Part of temperature range of EN 60721-3-3, class 3K6, with high air temperature restricted to +5 °C. Includes temperature range of EN 60721-3-4, class 4K1, with high air temperature range restricted to +5 °C
AB4	-5	+40	5	95	1	29	Weather protected locations having neither temperature nor humidity control. Heating may be used to raise low ambient temperatures. Normal [b]	Identical with temperature range of EN 60721-3-3, class 3K5. The high air temperature restricted to +40 °C
AB5	+5	+40	5	85	1	25	Weather protected locations with temperature control. Normal [b]	Identical with temperature range of EN 60721-3-3, class 3K3
AB6	+5	+60	10	100	1	35	Indoor and outdoor locations with extremely high ambient temperatures. Influence of cold ambient temperatures is prevented. Occurrence of solar and heat radiation. Appropriate arrangements shall be made [c].	Part of temperature range of EN 60721-3-3, class 3K7, with low air temperature restricted to +5 °C and high air temperature restricted to +60 °C. Includes temperature range of EN 60721-3-4, class 4K4, with low air temperature restricted to +5 °C
AB7	-25	+55	10	100	0,5	29	Indoor weather protected locations having neither temperature nor humidity control, the locations may have openings directly to the open air and be subjected to solar radiation. Appropriate arrangements shall be made [c].	Identical with temperature range of EN 60721-3-3, class 3K6
AB8	-50	+40	15	100	0,04	36	Outdoor and non-weather protected locations, with low and high temperatures. Appropriate arrangements shall be made [c].	Identical with temperature range of EN 60721-3-4, class 4K3

NOTE 1 All specified values are maximum or limit values which will have a low possibility of being exceeded.

NOTE 2 The low and high relative humidities are limited by the low and high absolute humidities, so that e.g. for environmental parameters a) and c), or b) and d), the limit values given do not occur simultaneously. Therefore, the Annex B contains climatograms which describes the interdependence of air temperature, relative humidity and absolute humidity for the climatic classes specified.

[a] May necessitate certain supplementary precautions (e.g. special lubrication).

[b] This means that ordinary equipment will operate safely under the described external influences.

[c] This means that special arrangements should be made, for example, between the designer of the installation and the equipment manufacturer, e.g. for specially designed equipment.

Table 51A *(continued)*

Code	External influences	Characteristics required for selection and erection of equipment	Reference
AC	*Altitude*		
AC1	≤ 2 000 m	Normal [b]	
AC2	> 2 000 m	May necessitate special precautions such as the application of derating factors. NOTE For some equipment special arrangements may be necessary at altitudes of 1 000 m and above.	
AD	*Presence of water*		
AD1	Negligible	Probability of presence of water is negligible. Location in which the walls do not generally shows traces of water but may do so for short periods, for example in the form of vapour which good ventilation dries rapidly. IPX0	EN 60721-3-4 class 4Z6 EN 60529
AD2	Free-falling drops	Possibility of vertically falling drops. Location in which water vapour occasionally condenses as drops or where steam may occasionally be present. IPX1 or IPX2	EN 60721-3-3 class 3Z7 EN 60529
AD3	Sprays	Possibility of water falling as a spray at an angle up to 60° from the vertical. Locations in which sprayed water forms a continuous film on floors and/or walls. IPX3	EN 60721-3-3 class 3Z8 EN 60721-3-4 class 4Z7 EN 60529
AD4	Splashes	Possibility of splashes from any direction. Locations where equipment may be subjected to splashed water; this applies, for example, to certain external luminaires, construction site equipment. IPX4	EN 60721-3-3 class 3Z9 EN 60721-3-4 class 4Z7 EN 60529
AD5	Jets	Possibility of jets of water from any direction. Locations where hose water is used regularly (yards, car-washing bays). IPX5	EN 60721-3-3 class 3Z10 EN 60721-3-4 class 4Z8 EN 60529
AD6	Waves	Possibility of water waves. Seashore locations such as piers, beaches, quays, etc. IPX6	EN 60721-3-4 class 4Z9 EN 60529
AD7	Immersion	Possibility of intermittent partial or total covering by water. Locations which may be flooded and/or where water may be at maximum 150 mm above the highest point of equipment, the lowest part of equipment being not more than 1 m below the water surface IPX7	 EN 60529
AD8	Submersion	Possibility of permanent and total covering by water. Locations such as swimming pools where electrical equipment is permanently and totally covered with water under a pressure greater than 10 kPa. IPX8	 EN 60529

[a] May necessitate certain supplementary precautions (e.g. special lubrication).

[b] This means that ordinary equipment will operate safely under the described external influences.

[c] This means that special arrangements should be made, for example, between the designer of the installation and the equipment manufacturer, e.g. for specially designed equipment.

Table 51A *(continued)*

Code	External influences	Characteristics required for selection and erection of equipment	Reference
AE	*Presence of foreign solid bodies*		
AE1	Negligible	The quantity or size of dust or foreign solid bodies is not significant.	EN 60721-3-3 class 3S1 EN 60721-3-4 class 4S1
		IP0X	EN 60529
AE2	Small objects (2,5 mm)	Presence of foreign solid bodies where the smallest dimension is not less than 2,5 mm.	EN 60721-3-3 class 3S2 EN 60721-3-4 class 4S2
		IP3X	EN 60529
		Tools and small objects are examples of foreign solid bodies of which the smallest dimension is at least 2,5 mm.	
AE3	Very small objects (1 mm)	Presence of foreign solid bodies where the smallest dimension is not less than 1 mm.	EN 60721-3-3 class 3S3 EN 60721-3-4 class 4S3
		IP4X	EN 60529
		Wires are examples of foreign solid bodies of which the smallest dimension is not less than 1 mm.	
AE4	Light dust	Presence of dust	EN 60721-3-3, class 3S2
		if dust penetration is not harmful to the functioning of the equipment	EN 60721-3-4, class 4S2
		IP5X	EN 60529
AE5	Moderate dust	Presence of dust	EN 60721-3-3, class 3S3
		if dust penetration is harmful to the functioning of the equipment	EN 60721-3-4, class 4S3
		IP6X	EN 60529
AE6	Heavy dust	Presence of dust	EN 60721-3-3, class 3S4
		Dust must not penetrate equipment	EN 60721-3-4, class 4S4
		IP6X	EN 60529
AF	*Presence of corrosive or polluting substances*		
AF1	Negligible	The quantity or nature of corrosive or polluting substances is not significant.	EN 60721-3-3 class 3C1 EN 60721-3-4 class 4C1
		Normal [b]	
AF2	Atmospheric	The presence of corrosive or polluting substances of atmospheric origin is significant.	EN 60721-3-3 class 3C2 EN 60721-3-4 class 4C2
		Installations situated by the sea or near industrial zones producing serious atmospheric pollution, such as chemical works, cement works; this type of process leads to the production of abrasive, insulating or conductive dusts.	
		According to the nature of substances (for example, satisfaction of salt mist test according to EN 60068-2-11).	
AF3	Intermittent or accidental	Intermittent or accidental subjection to corrosive or polluting chemical substances being used or produced.	EN 60721-3-3 class 3C3 EN 60721-3-4 class 4C3
		Locations where some chemicals products are handled in small quantities and where these products may come only accidentally into contact with electrical equipment; such conditions are found in factory laboratories, other laboratories or in locations where hydrocarbons are used (boiler-rooms, garages, etc.).	
		Protection against corrosion according to equipment specification.	
AF4	Continuous	Continuously subject to corrosive or polluting chemical substances in substantial quantity, e.g. chemical works.	EN 60721-3-3 class 3C4 EN 60721-3-4 class 4C4
		Equipment specially designed according to the nature of substances.	

[a] May necessitate certain supplementary precautions (e.g. special lubrication).

[b] This means that ordinary equipment will operate safely under the described external influences.

[c] This means that special arrangements should be made, for example, between the designer of the installation and the equipment manufacturer, e.g. for specially designed equipment.

Table 51A *(continued)*

Code	External influences	Characteristics required for selection and erection of equipment	Reference
AG	*Mechanical stress :Impact*		
AG1	Low severity	Normal, e.g. household and similar equipment	EN 60721-3-3, classes 3M1/3M2/3M3 EN 60721-3-4, classes 4M1/4M2/4M3
AG2	Medium severity	Standard industrial equipment, where applicable, or reinforced protection	EN 60721-3-3, classes 3M4/3M5/3M6 EN 60721-3-4, classes 4M4/4M5/4M6
AG3	High severity	Reinforced protection	EN 60721-3-3, classes 3M7/3M8 EN 60721-3-4, classes 4M7/4M8
AH	*Vibration*		
AH1	Low severity	Household and similar conditions where the effects of vibration are generally negligible Normal [b]	EN 60721-3-3, classes 3M1/3M2/3M3 EN 60721-3-4, classes 4M1/4M2/4M3
AH2	Medium severity	Usual industrial conditions Specially designed equipment or special arrangements	EN 60721-3-3, classes 3M4/3M5/3M6 EN 60721-3-4, classes 4M4/4M5/4M6
AH3	High severity	Industrial installations subject to severe conditions Specially designed equipment or special arrangements	EN 60721-3-3, classes 3M7/3M8 EN 60721-3-4, classes 4M7/4M8
AJ	*Other mechanical stresses: Under consideration*		
AK	*Presence of flora and/or moulds growth*		
AK1	No hazard	No harmful hazard from flora and/or mould growth Normal [b]	EN 60721-3-3, class 3B1 EN 60721-3-4, class 4B1
AK2	Hazard	Harmful hazard from flora and/or mould growth The hazard depends on local conditions and the nature of flora. Distinction should be made between harmful growth of vegetation or conditions for promotion of mould growth Special protection, such as: – increased degree of protection (see AE); – special materials or protective coating of enclosures; – arrangements to exclude flora from location.	EN 60721-3-3, class 3B2 EN 60721-3-4, class 4B2
AL	*Presence of fauna*		
AL1	No hazard	No harmful hazard from fauna Normal [b]	EN 60721-3-3, class 3B1 EN 60721-3-4, class 4B1
AL2	Hazard	Harmful hazard from fauna (insects, birds, small animals) The hazard depends on the nature of the fauna. Distinction should be made between: – presence of insects in harmful quantity or of an aggressive nature; – presence of small animals or birds in harmful quantity or of an aggressive nature. Protection may include: – an appropriate degree of protection against penetration of foreign solid bodies (see AE); – sufficient mechanical resistance (see AG); – precautions to exclude fauna from the location (such as cleanliness, use of pesticides); – special equipment or protective coating of enclosures.	EN 60721-3-3, class 3B2 EN 60721-3-4, class 4B2

[a] May necessitate certain supplementary precautions (e.g. special lubrication).

[b] This means that ordinary equipment will operate safely under the described external influences.

[c] This means that special arrangements should be made, for example, between the designer of the installation and the equipment manufacturer, e.g. for specially designed equipment.