SLOVENSKI STANDARD
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Električne inštalacije zgradb – 7. del: Zahteve za posebne inštalacije ali lokacije – 753. oddelek: Sistemi talnega in stropnega ogrevanja

Electrical installations of buildings -- Part 7: Requirements for special installations or locations -- Section 753: Floor and ceiling heating systems

Elektrische Anlagen von Gebäuden -- Teil 7: Anforderungen für Betriebsstätten, Räume und Anlagen besonderer Art - Hauptabschnitt 753: Fußboden- und Decken-Flächenheizungen

Installations électriques des bâtiments -- Partie 7: Règles pour les installations et emplacements spéciaux -- Section 753: Systèmes de chauffage par sol ou plafond

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ICS:

91.140.10	Sistemi centralnega ogrevanja	Central heating systems
91.140.50	Sistemi za oskrbo z elektriko	Electricity supply systems
97.100.10	Električni grelniki	Electric heaters

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Electrical installations of buildings
Part 7: Requirements for special installations or locations
Section 753: Floor and ceiling heating systems

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Elektrische Anlagen von Gebäuden
Teil 7: Anforderungen für Betriebsstätten, Räume und Anlagen besonderer Art - Hauptabschnitt 753: Fußboden- und Decken-Flächenheizungen

This Harmonization Document was approved by CENELEC on 2002-05-01. 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.

Up-to-date lists and bibliographical references concerning such national implementation 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).

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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

This Harmonization Document was prepared by SC 64B, Protection against thermal effects, of Technical Committee CENELEC TC 64, Electrical installations of buildings.

The text of the draft was submitted to the formal vote and was approved by CENELEC as HD 384.7.753 S1 on 2002-05-01.

The following dates were fixed:

– latest date by which the existence of the HD has to be announced at national level	(doa)	2002-11-01
– latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement	(dop)	2003-05-01
– latest date by which the national standards conflicting with the HD have to be withdrawn	(dow)	2005-05-01

Annexes designated “normative” are part of the body of the standard.
In this standard, annexes A and ZA are normative.

Introduction

The particular requirements of part 7 supplement, modify or supersede the general requirements of the other parts of HD 384.

The numbers following the particular number of section 753 are those of the corresponding parts, chapters or clauses of HD 384.

The absence of reference to parts, chapters or clauses means that the general requirements of HD 384 are applicable.

753 Floor and ceiling heating systems

753.1 Scope, object, fundamental principals

753.1.1 Scope

This standard applies to the installation of electric floor and ceiling heating systems which are erected as either thermal storage heating system or direct heating system. It does not apply to the installation of wall heating systems.

NOTE A ceiling located under the roof of a building down to a vertical height of 1,50 m measured from the finished floor surface is also regarded as a ceiling within the meaning of this standard.

753.1.2 Normative references

NOTE Normative references to international publications with their corresponding European publications are listed in annex ZA.

753.2 Definitions

For the purpose of this Harmonization Document, the following definitions apply:

753.2.1
thermal storage floor heating system
heating system in which, due to a limited charging period, a restricted availability of electrical energy is converted into heat and dissipated mainly through the surface of the floor to the room, to be heated with an intended time delay

753.2.2
direct heating system
as floor or ceiling heating system denotes a heating installation which generates heat from electrical energy and dissipates it to the room to be heated, with a response time being as low as possible

753.2.3
complementary floor heating
direct heating system integrated into the floor construction e.g. in the border zones close to outer walls which complements the heat dissipation of a thermal storage floor heating system

753.2.4
heating-free area
unheated floor or ceiling area which is completely covered when placing pieces of furniture or kept free for built-in furniture

753.2.5
heating cable
cable, with or without a screen or metal sheath, for a fixed heating system

753.2.6
flexible sheet heating element
heating element consisting of sheets of electrical insulation laminated with electrical resistance material, or a base material on which electrically insulated heating wires are fixed

753.2.7
heating unit
heating cable or flexible sheet heating element with rigidly fixed cold leads or terminal fittings which are connected to the terminal of the electrical installation

753.2.8
cold lead
insulated cable or cord intended to connect the heating unit with the electrical installation

753.2.9
self limiting heating cable
cable to EN 50019 which cannot exceed 70 °C and which does not require cold leads for connection to the electrical installation

753.4 Protection for safety

753.41 Protection against electric shock

753.412 Protection against direct contact

753.412.3 Protection by obstacles

Protection by obstacles is not applicable.

753.412.4 Protection by placing out of reach

Protection by placing out of reach is not applicable.

753.413 Protection against indirect contact

753.413.1 Protection by automatic disconnection of supply

As disconnection devices RCD with a rated residual operating current not exceeding 30 mA shall be used.

753.413.1.6 Supplementary equipotential bonding

Where a conductive sheath or grid above the floor heating elements or under the ceiling heating elements is provided, it shall be connected to the protective conductor of the electrical installation by equipotential bonding conductors.

NOTE In the case of heating units which are delivered from the manufacturer without exposed-conductive-part a conductive sheath or grid may be provided as exposed-conductive-part above the floor heating elements or under the ceiling heating elements.

753.413.2 Protection by using equipment of Class II construction or equivalent insulation

Circuits supplying heating equipment of class II construction or equivalent insulation shall have additional protection by the use of RCD with a rated residual operating current not exceeding 30 mA.

753.413.3 Protection by non-conducting location

Protection by non-conducting location is not applicable.

753.413.4 Protection by earth-free equipotential

Protection by earth-free local equipotential bonding is not applicable.

753.413.5 Protection by electrical separation

If protection by electrical separation is used, it shall be applied in accordance with 413.5.1, 1st indent, for every heating circuit.

753.42 Protection against thermal effects

753.424 Protection against overheating

753.424.3 Heating units

753.424.3.1 To avoid overheating of floor or ceiling heating systems in buildings, at least one of the following measures shall be applied to limit the temperature in the heating zone to a maximum of 80 °C:

- appropriate design of the heating system;
- appropriate installation of the heating system in accordance with the manufacturer's instructions;
- use of protective devices.

Heating units shall be connected to the electrical installation via cold leads or terminal fittings.

Heating units shall be inseparably connected to cold leads, e.g. by a crimping connection.

Heating units shall not cross expansion joints.

753.5 Selection and erection of equipment

753.51 Common rules

753.511 Compliance with standards

Flexible sheet heating elements shall comply with the requirements of IEC 60335-2-96.

Heating cables shall comply either with IEC 60800 or for industrial applications with IEC 61423.

753.512 Operational conditions and external influences

753.512.2 External influences

753.512.2.5 Heating units for installation in ceilings shall be at least IPX1. Heating units for installation in a floor of concrete or similar material shall be IPX7.

753.514 Identification

The installer shall provide a plan for each heating system containing the following details:

- type of heating units;
- number of heating units installed;
- length/area of heating units;
- surface power density;

- layout of the heating units;
- position/depth of heating units;
- position of junction boxes;
- conductors, shields and the like;
- installed/heated area;
- rated voltage;
- rated resistance (cold) of heating units;
- rated current of overcurrent protective device;
- rated residual operating current of RCD.

This plan shall be fixed on or adjacent to the switchgear assembly of the heating system.

Furthermore, the normative annex A applies to floor and ceiling heating systems to inform the owner and the user of the installation.

753.52 Wiring systems

753.520 General

753.520.3 Heating-free areas

For the necessary attachment of room fittings, heating-free areas shall be provided in such a way that the heat emission is not prevented by such fittings.

753.522 Selection and erection in relation to external influences

753.522.1 Ambient temperature (AA) (see 321.1 of HD 384.3 S2)

753.522.1.3 For cold leads (circuit wiring) and control leads installed in the zone of heated surfaces, the increase of ambient temperature shall be taken into account.

753.522.4 Presence of solid foreign bodies (AE) (see 321.5 of HD 384.3 S2)

753.522.4.3 The installer shall inform other contractors that no penetrating means, such as screws for door stoppers, shall be used in the area where floor or ceiling heating units are installed.

Annex A
(normative)

Information for the contractor and the user of the installation

A description of the heating system shall be provided by the installer of the heating system for the owner of the building upon completion of the installation or for his agent.

The description shall contain at least the following information:

a) description of the construction of the heating system, especially the installation depth of the heating units;

b) location diagram with information concerning

- the distribution of the heating circuits and their rated power,
- the position of the heating units in each room,
- particularities which have been taken into account when installing the heating units, e.g. heating-free areas, complementary heating zones, unheated spared areas for fixing means penetrating into the floor covering;

c) data on the control equipment used with relevant circuit diagrams and the dimensioned position of floor temperature and weather conditions sensors, if any;

d) data on the type of heating units and their maximum operating temperature.

The installer shall inform the owner that the description of the heating system includes all necessary information, e.g. for repair work. In addition, the owner shall be requested to hand over in time the instructions for use of the heating installation.

The installer of the heating system shall hand over an appropriate number of instructions for use to the owner or his agent upon completion. One copy of the instructions for use shall be permanently fixed in or near each relevant distribution board.

The instructions for use shall include at least the following data:

- description of the heating system and its function;
- operation of the heating installation in the first heating period in case of a new building, e.g. regarding drying out;
- operation of the control equipment for the heating system in the dwell area and the complementary heating zones as well, if any;
- information on the restriction on placing of furniture or similar
  - additional floor coverings, e.g. carpets with a thickness of > 10 mm may lead to higher floor temperatures which can adversely effect the performance of the heating system,
  - pieces of furniture solidly covering the floor and/or built-in cupboards shall only be placed on heating-free areas,
  - furniture, such as carpets, seating and rest furniture with pelmets, which in part do not solidly cover the floor may not be placed in complementary heating zones, if any;