

SLOVENSKI STANDARD

SIST HD 384.7.702 S2:2003

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Electrical installations of buildings -- Part 7: Requirements for special installations or locations -- Section 702: Swimming pools and other basins

Elektrische Anlagen von Gebäuden -- Teil 7: Anforderungen für Betriebsstätten, Räume und Anlagen besonderer Art -- Hauptabschnitt 702: Schwimmbäder und andere Becken

Installations électriques des bâtiments -- Partie 7: Règles pour les installations et emplacements spéciaux -- Section 702: Piscines et autres bassins

Ta slovenski standard je istoveten z: **HD 384.7.702 S2:2002**

ICS:

91.140.50	Sistemi za oskrbo z elektriko	Electricity supply systems
97.220.10	Športni objekti	Sports facilities

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HARMONIZATION DOCUMENT

HD 384.7.702 S2

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

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ICS 29.020; 91.140.50

Supersedes HD 384.7.702 S1:1991

English version

Electrical installations of buildings
Part 7: Requirements for special installations or locations
Section 702: Swimming pools and other basins
(IEC 60364-7-702:1997, modified)

Installations électriques des bâtiments
Partie 7: Règles pour les installations et
emplacements spéciaux
Section 702: Piscines et autres bassins
(CEI 60364-7-702:1997, modifiée)

Elektrische Anlagen von Gebäuden
Teil 7: Anforderungen für Betriebsstätten,
Räume und Anlagen besonderer Art
Hauptabschnitt 702: Schwimmbäder und
andere Becken
(IEC 60364-7-702:1997, modifiziert)

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This Harmonization Document was approved by CENELEC on 2002-06-01. 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).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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

Foreword

The text of the International Standard IEC 60364-7-702:1997, prepared by IEC TC 64, Electrical installations and protection against electric shock, together with the common modifications prepared by SC 64A, Protection against electric shock, of Technical Committee CENELEC TC 64, Electrical installations of buildings, was submitted to the formal vote and was approved by CENELEC as HD 384.7.702 S2 on 2002-06-01.

This Harmonization Document supersedes HD 384.7.702 S1:1991.

The following dates were fixed:

- latest date by which the existence of the HD has to be announced at national level (doa) 2002-12-01
- latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 2003-06-01
- latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 2005-06-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annex A is informative.

Annex ZA has been added by CENELEC.

In this Harmonization Document the common modifications to the International Standard are indicated by a vertical line in the left margin of the text.

702 Swimming pools and other basins

702.1 Scope, object and fundamental principles

702.11 Scope

The particular requirements of this section apply to the basins of swimming pools, the basins of fountains and the basins of paddling pools. They also apply to the surrounding zones of all these basins. In these areas, in normal use, the effect of an electric shock is increased by a reduction in body resistance and contact of the body with earth potential. Swimming pools within the scope of an equipment standard are outside the scope of this standard. For swimming pools for medical purposes special precautions may be necessary.

Except for areas especially designed as swimming pools, this section does not apply to natural waters, lakes in gravel pits, coastal areas and similar areas.

702.12 Normative references

See annex ZA.

702.2 Definitions

702.2.21 Guide to general terms

For the purpose of this section, the following definitions apply. For other general definitions, see HD 384.2.

702.2.21.1

basin of fountain

basin not intended to be occupied by persons and which cannot be accessed (reached by persons) without the use of ladders and similar means. For basins of fountains which may be occupied by persons, the specifications and requirements for swimming pools apply

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702.2.21.2

small swimming pool

a pool where there is no zone 2

702.3 Assessment of general characteristics

702.32 Classification of external influences

These requirements are based on the dimensions of three zones (examples are given in Figures 702A, 702B, 702C and 702D).

Zones 1 and 2 may be limited by fixed partitions having a minimum height of 2,5 m.

a) Zone 0

This zone is the interior of the basins including any recesses in their walls or floors, basins for foot cleaning and waterjets or waterfalls and the space below them.

b) Zone 1

This zone is limited by

- zone 0,
- a vertical plane 2 m from the rim of the basin,
- the floor, or the surface expected to be occupied by persons,
- the horizontal plane 2,5 m above the floor or the surface expected to be occupied by persons.

When the swimming pool contains diving boards, spring boards, starting blocks, chutes or other components expected to be occupied by persons, zone 1 comprises the zone limited by

- a vertical plane situated 1,5 m around the diving boards, spring boards, starting blocks, chutes and other components such as accessible sculptures and decorative basins,
- the horizontal plane 2,5 m above the highest surface expected to be occupied by persons.

c) Zone 2

This zone is limited by

- the vertical plane external to zone 1 and a parallel plane 1,5 m from the former,
- the floor or surface expected to be occupied by persons,
- the horizontal plane 2,5 m above the floor or the surface expected to be occupied by persons.

There is no zone 2 for fountains.

702.4 Protection for safety

702.41 Protection against electric shock

NOTE 1 For protection of socket-outlets, see also clause 702.53.

NOTE 2 For protection of other equipment, see also clause 702.55.

702.411 Protection against both direct and indirect contact

702.411.1 Protection by extra-low-voltage: SELV and PELV

702.411.1.4 Requirements for unearthed circuits (SELV)

702.411.1.4.3 Where SELV is used, whatever the nominal voltage, protection against direct contact shall be provided by

- barriers or enclosures affording at least the degree of protection IPXXB according to EN 60529, or
- insulation capable of withstanding a test voltage of 500 V a.c. for 1 minute.

702.412 Protection against electric shock in normal service (Protection against direct contact or basic protection)

702.412.3 Protection by obstacles

Protection by obstacles is not permitted.

702.412.4 Protection by placing out of reach

Protection by placing out of reach is not permitted.

702.413 Protection against indirect contact

702.413.1.6 Supplementary protective equipotential bonding

All extraneous-conductive-parts in zones 0, 1 and 2 shall be connected by protective equipotential bonding conductors and connected to the protective conductor of the exposed-conductive-parts of equipment situated in these zones.

NOTE 1 The connection with the protective conductor may be provided in the proximity of the location, e.g. in an accessory or in a distribution board.

NOTE 2 See also 702.55.1.

702.413.3 Protection by non-conducting locations

Protection by non-conducting locations is not permitted.

702.413.4 Protection by earth free local equipotential bonding

Protection by earth free local equipotential bonding is not permitted.

702.47 Application of protective measures for safety**702.471 Measures of protection against electric shock****702.471.4 Particular requirements for each zone****702.471.4.1 Zones 0 and 1**

Except for fountains as stated in 702.471.4.2 and the exceptions specified in clause 702.53, in zones 0 and 1, only protection by SELV at a nominal voltage not exceeding 12 V a.c. or 30 V d.c. is permitted, the source for SELV being installed external to zones 0, 1 and 2.

Equipment for use in the interior of basins which are only intended to be in operation when people are not inside zone 0 shall be supplied by circuits protected either by

- SELV (see clause 411.1 of HD 384.4.41), the source for SELV being installed outside zones 0, 1 and 2. The source for SELV may be installed in zone 2 if its supplying circuit is protected by a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA, or
- automatic disconnection of the supply (see clause 413.1 of HD 384.4.41), using a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA, or
- electrical separation (see clause 413.5 of HD 384.4.41), the source for electrical separation supplying only one item of current-using equipment and being installed external to zones 0, 1 and 2. The source for electrical separation may be installed in zone 2 if its supplying circuit is protected by a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA.

The socket-outlets of circuits supplying such equipment and the control device of such equipment shall have a notice, in order to warn the user that this equipment shall be used only when the swimming pool is not occupied by persons.

702.471.4.2 Zones 0 and 1 of fountains

In zones 0 and 1, one or more of the following protective measures shall be employed:

- SELV (see clause 411.1 of HD 384.4.41), the source for SELV being installed outside zones 0 and 1; or
- automatic disconnection of supply (see clause 413.1 of HD 384.4.41) using a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA; or
- electrical separation (see clause 413.5 of HD 384.4.41), the source for electrical separation supplying only one item of current-using equipment and being installed external to zones 0 and 1.

702.471.4.3 Zone 2

NOTE There is no zone 2 for fountains.

One or more of the following protective measures shall be employed:

- SELV (see clause 411.1 of HD 384.4.41), the source for SELV being installed outside zones 0, 1 and 2. The source for SELV may be installed in zone 2 if its supplying circuit is protected by a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA; or
- automatic disconnection of supply (see clause 413.1 of HD 384.4.41), using a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA; or
- electrical separation (see clause 413.5 of HD 384.4.41), the source for electrical separation supplying only one item of current-using equipment and being installed external to zones 0, 1 and 2. The source for electrical separation may be installed in zone 2 if its supplying circuit is protected by a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA.

702.5 Selection and erection of electrical equipment

702.51 Common rules

702.512 Operational conditions and external Influences

702.512.2 External influences

Electrical equipment shall have at least the following degrees of protection according to EN 60529:

- zone 0: IPX8;
- zone 1: IPX4,
IPX5 where water jets are likely to occur for cleaning purposes;
- zone 2: IPX2 for indoor locations,
IPX4 for outdoor locations,
IPX5 where water jets are likely to occur for cleaning purposes.

702.52 Wiring systems

702.520 General

The following rules apply to surface wiring systems and to wiring systems embedded either in the walls, ceilings or in floors at a depth not exceeding 5 cm.

702.522 Selection and erection in relation to external influences

702.522.21 Erection according to the zones

In zones 0, 1 and 2, any metallic sheath or metallic covering of wiring systems shall be connected to the supplementary protective equipotential bonding.

NOTE Cables should preferably be installed in conduits made of insulating material.

702.522.22 Limitation of wiring systems according to the zones

In zones 0 and 1, wiring systems shall be limited to those necessary to supply equipment situated in these zones.

702.522.23 Additional requirements for the wiring of fountains

For fountains, the following additional requirements shall be met:

- a) cables for electrical equipment in zone 0 shall be installed as far outside the basin rim as reasonably practical and run to the electrical equipment inside zone 0 by the shortest practicable route;
- b) in zone 1, cables shall be installed with suitable mechanical protection.

Cables shall comply with HD 22.16 but shall not be used unless the manufacturer has also declared their suitability for continued immersion in water.

702.522.24 Junction boxes

Junction boxes shall not be installed in zones 0 and 1, but in case of SELV circuits they may be installed in zone 1.

702.53 Switchgear and controlgear

In zones 0 and 1, no switchgear or controlgear, including socket-outlets, shall be installed.

In zone 2, socket-outlets and switches are permitted only if the circuits supplying them are protected by one of the following protective measures:

- SELV (see clause 411.1 of HD 384.4.41), the source of SELV being installed outside zones 0, 1 and 2. The source of SELV may be installed in zone 2 if its supplying circuit is protected by a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA; or
- automatic disconnection of supply (see clause 413.1 of HD 384.4.41), using a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA; or
- electrical separation (see clause 413.5 of HD 384.4.41), the source for electrical separation supplying only one item of current-using equipment or one socket-outlet being installed external to zones 0, 1 and 2. The source for electrical separation may be installed in zone 2 if its supplying circuit is protected by a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA.

For small swimming pools where it is not possible to locate socket-outlets and switches outside zone 1, socket-outlets and switches, preferably having non conductive covers or coverplates, are permitted in zone 1 if they are installed outside arm's reach (1,25 m) from the zone 0 border, and placed at least 0,3 m above the floor, and they shall be protected either by

- SELV (see clause 411.1 of HD 384.4.41), at a nominal voltage not exceeding 25 V a.c. or 60 V d.c., the source for SELV being installed outside zones 0 and 1, or
- automatic disconnection of supply (see clause 413.1 of HD 384.4.41), using a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA, or
- electrical separation (see clause 413.5 of HD 384.4.41) individually, the source for electrical separation being installed external to zones 0 and 1.

702.55 Other equipment

702.55.1 Current-using equipment of swimming pools

In zones 0 and 1, only fixed current-using equipment especially designed for use in swimming pools may be installed, taking into account the requirements of 702.55.2 and 702.55.4.

Appliances which are intended to be in operation only when people are outside the zone 0 may be used in all zones provided that they are supplied by circuits protected according to 702.471.4.

Electric heating units embedded in the floor may be installed, provided that they are

- protected by SELV (see clause 411.1 of HD 384.4.41), the source of SELV being installed outside zones 0, 1 and 2. The source of SELV may be installed in zone 2 if its supplying circuit is protected by a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA; or
- covered by an embedded earthed metallic grid or by an embedded earthed metallic sheath connected to the supplementary protective equipotential bonding specified in 702.413.1.6 provided that their supply circuits are additionally protected by a residual current protective device with a rated residual operating current $I_{\Delta n}$ not exceeding 30 mA.

702.55.2 Underwater luminaires for swimming pools

Luminaires for use in the water or in contact with the water shall be fixed and shall comply with EN 60598-2-18.