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Low-voltage electrical installations –

**Part 7-721:
Requirements for special installations
or locations – Electrical installations
in caravans and motor caravans**

Installations électriques à basse tension –

**Partie 7-721:
Exigences pour les installations ou
emplacements spéciaux – Installations
électriques dans les caravanes
et caravanes à moteur**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

**Part 7-721: Requirements for special installations or locations –
Electrical installations in caravans and motor caravans**

FOREWORD

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International Standard IEC 60364-7-721 has been prepared by IEC technical committee 64: Electrical installations and protection against electrical shock.

The text of this standard is based on the following documents:

FDIS	Report on voting
64/1576/FDIS	64/1596/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The reader's attention is drawn to the fact that Annex D lists all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this standard.

A list of all the parts in the IEC 60364 series, under the general title *Low-voltage electrical installations*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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INTRODUCTION

The requirements of this part of IEC 60364 supplement, modify or replace certain of the general requirements in Parts 1 to 6 of IEC 60364.

The clause numbering of Part 7-721 follows the pattern and corresponding references of IEC 60364. The numbers following the particular number of Part 7-721 are those of the corresponding parts or clauses of IEC 60364.

The absence of reference to a part or a clause means that the corresponding general requirements of IEC 60364 are applicable.

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LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

Part 7-721: Requirements for special installations or locations – Electrical installations in caravans and motor caravans

721 Electrical installations in caravans and motor caravans

721.1 Scope

The particular requirements of this part of IEC 60364 apply to the electrical installation of caravans and motor caravans.

They apply to those electrical circuits and equipment intended for the use of the caravan for habitation purposes.

They do not apply to those electrical circuits and equipment for automotive purposes.

They do not apply to the electrical installations of mobile homes, residential park homes and transportable units.

NOTE 1 For mobile homes and residential park homes the general requirements apply.

NOTE 2 For transportable units see IEC 60364-7-717.

NOTE 3 For the purpose of this standard, caravans and motor caravans are referred to as “caravans”

The particular requirements of some parts from the IEC 60364-7 series may also apply to such installations in caravans, e.g. IEC 60364-7-701.

721.2 Normative references

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.

IEC 60038, *IEC standard voltages*

IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750 V*

IEC 60309-1, *Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements*

IEC 60309-2, *Plugs, socket-outlets and couplers for industrial purposes – Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories*

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*

IEC 60335-1, *Household and similar electrical appliances – Safety – Part 1: General requirements*

IEC 60335-2-29, *Household and similar electrical appliances – Safety – Part 2-29: Particular requirements for battery chargers*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60614-2-2, *Specification for conduits for electrical installations – Part 2: Particular specification for conduits – Section Two: Rigid plain conduits of insulating materials*

IEC 60614-2-3, *Specification for conduits for electrical installations – Part 2: Particular specifications for conduits. Section Three: Pliable conduits of insulating material*

IEC 60947-2, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

IEC 61008-1, *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – Part 1: General rules*

IEC 61009-1, *Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) – Part 1: General rules*

IEC 61084 (all parts), *Cables trunking and ducting systems for electrical installations*

IEC 61386, *Conduit systems for cable management*

IEC 61558-2-6, *Safety of power transformers, power supply units and similar – Part 2: Particular requirements for safety isolating transformers for general use*

ISO 1724, *Road vehicles – Connectors for the electrical connection of towing and towed vehicles – 7-pole connector type 12 N (normal) for vehicles with 12 V nominal supply voltage*

ISO 3732, *Road vehicles – Connectors for the electrical connection of towing and towed vehicles – 7-pole connector type 12 S (supplementary) for vehicles with 12 V nominal supply voltage*

ISO 6309, *Fire protection – Safety signs*

ISO 8820, *Road vehicles – Fuse-links*

ISO 11446, *Road vehicles – Connectors for the electrical connection of towing and towed vehicles – 13-pole connectors for vehicles with 12 V nominal supply voltage*

721.3 Terms and definitions

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

721.3.1

leisure accommodation vehicle

unit of living accommodation for temporary or seasonal occupation that may meet the requirements for the construction and use of road vehicles

721.3.1.1

caravan

trailer leisure accommodation vehicle, used for touring, that meets the requirements for the construction and use of road vehicles

721.3.1.2

motor caravan

self-propelled leisure accommodation vehicle, used for touring, that meets the requirements for the construction and use of road vehicles

NOTE A motor caravan is either adapted from a series production vehicle, or designed and built on an existing chassis, with or without the driving cab, the accommodation being either fixed or dismantlable.

721.3.1.3

mobile home

transportable leisure accommodation vehicle that includes means for mobility but does not meet the requirements for the construction and use of road vehicles

721.3.1.4

residential park home

a factory produced relocatable dwelling

721.31 Purposes, supplies and structure

721.313 Supplies

721.313.1.2 The nominal supply system voltage shall be selected from IEC 60038.

The nominal a.c. supply voltage of the installation of the caravan shall not exceed 230 V single-phase, or 400 V three-phase.

The nominal d.c. supply voltage of the installation of the caravan shall not exceed 48 V.

721.4 Protection for safety

721.41 Protection against electric shock

721.411.2 Requirements for basic protection

721.41.B.2 Obstacles

Protection by obstacles shall not be used.

721.41.B.3 Placing out of reach

Protection by placing out of reach shall not be used.

721.41.C.1 Non-conducting locations

Protection by non-conducting location shall not be used.

NOTE This precludes the use of class 0 equipment.

721.41.C.2 Protection by earth-free local equipotential bonding

Protection by earth-free equipotential bonding shall not be used.

721.411.3.1.2 Protective equipotential bonding

Structural metallic parts that are accessible from within the caravan shall be bonded to the protective conductor.

721.413 Protective measure: electrical separation

Protection by electrical separation shall not be used, except for a shaver socket-outlet.

721.414 Protective measure: extra-low voltage provided by SELV and PELV

Any part of a caravan installation operating at extra-low voltage shall comply with the requirements of Clause 414.

For extra-low voltage d.c. power sources, the following standard voltages are generally applicable: 12 V, 24 V, 42 V and 48 V.

In exceptional cases, when a.c. extra-low voltage is required, the following standard voltages (rms) are permitted: 12 V, 24 V, 42 V and 48 V.

NOTE The requirements of Part 721 are also applicable to extra low-voltage d.c. installation. See Annex B for recommendations that may be applied in addition.

721.415.1 Additional protection: residual current protective devices

Addition:

Where protection by automatic disconnection of supply is used, a residual current device with a rated residual operating current not exceeding 30 mA, complying with IEC 60947-2, IEC 61008-1 or IEC 61009-1 breaking all live conductors, shall be provided having the characteristics specified in 412.5.1.

Each supply inlet shall be directly connected to its associated RCD.

NOTE This implies that there may not be any taps or junctions in the circuit.

721.43 Protection against overcurrent

721.43.1 Final circuits

Each final circuit shall be protected by an overcurrent protective device which disconnects all live conductors of that circuit.

721.5 Selection and erection of equipment

721.51 Common rules

721.510 Introduction

721.510.3 General

Where there is more than one electrically independent installation, each independent installation shall be supplied by a separate connecting device and shall be segregated in accordance with general rules.

721.512 Operational conditions and external influences

721.512.2 External influences

NOTE Consideration should be given to the foreseeable external influences to which the caravan will be subjected.

721.514 Identification

721.514.1 General

Instructions for use shall be provided with the caravan so that the caravan can be used safely.

The instructions shall comprise:

- a description of the installation;
- a description of the function of the RCD(s) and the use of the test button;
- a description of the function of the main isolating switch;
- the text of the instructions of Annex A.

If it is necessary to take precautions during user maintenance, appropriate details shall be given.

721.521 Types of wiring systems

721.521.2 The wiring system shall use one or more of the following:

- insulated single-core cables, with flexible class 5 conductors, in non-metallic conduit or non-metallic trunking system;
- insulated single-core cables, with stranded class 2 conductors (minimum of 7 strands), in non-metallic conduit or non-metallic trunking system;
- sheathed flexible cables.

All cables shall as a minimum meet the requirements of IEC 60332-1-2.

Non-metallic conduit systems shall comply with the relevant part of IEC 60614-2 or IEC 61386.

Cable trunking systems and cable ducting systems shall comply with the relevant part of IEC 61084.

721.522 Selection and erection of wiring systems in relation to external influences

721.522.7 Vibration (AH)

721.522.7.1 As wiring systems will be subjected to vibration, every wiring system shall be protected against mechanical damage either by location or by additional protection. The following requirements shall be met:

- Precaution shall be taken to avoid mechanical damage due to sharp edges or abrasive parts.
- Cables passing through metalwork shall be protected by means of suitable bushes or grommets which are securely fixed in position.

721.522.8 Other mechanical stresses (AJ)

721.522.8.1.3 All cables, unless enclosed in rigid conduit, and all flexible conduit shall be supported at intervals not exceeding 0,4 m for vertical runs and 0,25 m for horizontal runs.

721.524 Cross-sectional areas of conductors

721.524.1 The cross-sectional area of every conductor shall be not less than 1,5 mm².

721.526 Electrical connections

721.526.1 Addition:

Connections between cables or conductors shall only be made in connecting boxes or electrical equipment.

NOTE Connections also include junctions and taps.

721.528 Proximity of wiring systems to other services

721.528.2 Proximity to non-electrical services

721.528.2.1 No electrical equipment including wiring systems, except ELV-equipment for gas-supply control, shall be installed in any gas cylinder storage compartment.

Where cables have to run through such a compartment, they shall be run at a height of less than 500 mm above the base of the cylinders, and such cables shall be protected against mechanical damage by installation within a continuous gas tight conduit or duct passing through the compartment.

Where installed, this conduit or duct shall be able to withstand an impact equivalent to AG3 without visible physical damage.

721.53 Isolation, switching and control

721.536 Isolation and switching

721.536.2 Isolation

721.536.2.1.1 Each installation shall be provided with a main isolating switch which shall disconnect all live conductors and which shall be suitably placed for ready operation within the caravan. In an installation consisting of only one final circuit, the isolating switch may be the overcurrent protection device providing such a device meets the requirements for isolation.

721.536.2.1.1.1 A notice in durable material shall be permanently fixed in the vicinity of the main isolating switch inside the caravan, bearing the text shown in Annex A in the official language(s) of the country in which the caravan is to be sold for the first time, in indelible and easily legible characters.

721.543 Protective conductors

721.543.2 Types of protective conductors

721.543.2.1 Circuit protective conductors shall be incorporated in a multicore cable or in a conduit together with the live conductors.

721.55 Other equipment

721.55.1 Inlets

721.55.1.1 Any a.c. electrical inlet on the caravan shall be an appliance inlet complying with IEC 60309-1. If interchangeability is required the inlet shall comply with IEC 60309-2.

721.55.1.2 The inlet, if any, shall be installed

- a) not more than 1,8 m above ground level, and
- b) in a readily accessible position, and
- c) have a minimum protection of IP44 with or without a connector engaged, and
- d) the inlet shall not protrude significantly beyond the body of the caravan.

721.55.2 Accessories

721.55.2.1 Every low-voltage socket-outlet, other than a shaver socket-outlet, shall incorporate an earth contact.

721.55.2.2 Every socket-outlet supplied at extra-low voltage shall have its voltage visibly marked.

721.55.2.3 Where an accessory is located in a position in which it is exposed to the effects of moisture it shall be constructed or enclosed so as to provide a degree of protection not less than IP44.

721.55.2.4 Each luminaire in a caravan shall preferably be fixed directly to the structure or lining of the caravan. Where a pendant luminaire is installed in a caravan, provision shall be made for securing the luminaire to prevent damage when the caravan is moved.

Accessories for the suspension of pendant luminaires shall be suitable for the mass suspended and the forces associated with vehicle movement.

721.55.2.5 A luminaire intended for dual voltage operation shall comply with the appropriate standard.

721.55.2.6 If the appliance inlet installed under 721.55.1.1 complies only with IEC 60309-1, the means of connection to the caravan pitch socket-outlet shall be supplied with the caravan and shall comprise the following:

- a) a plug complying with IEC 60309-2; and
- b) a flexible cord or cable
 - of 25 m (\pm 2 m) length,