

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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 60364-7-721

Edition 2.0 2017-06

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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.

This bilingual version (2019-09) corresponds to the monolingual English version, published in 2017-06.

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) A minimum height of not less than 500 mm above the base of the cylinders is now required for cables passing through the gas cylinder compartment. Where cables have to run through a compartment such cables shall be protected against mechanical damage by

installation within a continuous conduit or duct passing through the compartment (721.528.3.1).

- b) It is now required that each independent installation shall be provided with its own main isolating switch which shall disconnect all live conductors and which shall be suitably placed in a readily accessible location in the caravan.(721.536.2.1.1)
- c) The clause numbers for the protective measures not permitted (obstacles, placing out of reach, non-conducting locations and earth-free local equipotential bonding) have been changed.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
64/2200/FDIS	64/2210/RVD

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

The French version of this standard has not been voted upon.

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

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

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.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

For the purpose of this part (IEC 60364-7-721) the requirements of the general Parts 1 to 6 of IEC 60364 apply.

The IEC 60364-7-7XX parts of IEC 60364 contain particular requirements for special installations or locations which are based on the requirements of the general parts of IEC 60364 (IEC 60364-1 to IEC 60364-6). These IEC 60364-7-7XX parts are considered in conjunction with the requirements of the general parts.

The particular requirements of this part of IEC 60364 supplement, modify or replace certain of the requirements of the general parts of IEC 60364 being valid at the time of publication of this part. The absence of reference to the exclusion of a part or a clause of a general part means that the corresponding clauses of the general part are applicable (undated reference).

Requirements of other 7XX parts being relevant for installations covered by this part also apply. This part may therefore also supplement, modify or replace certain of these requirements valid at the time of publication of this part.

The clause numbering of this part follows the pattern and corresponding references of IEC 60364. The numbers following the particular number of this part are those of the corresponding parts, or clauses of the other parts of the IEC 60364 series, valid at the time of publication of this part, as indicated in the normative references of this document (dated reference).

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If requirements or explanations (additional to those of the other parts of the IEC 60364 series are needed, the numbering of such items appears as 721.101, 721.102, 721.103 etc.

In the case where new or amended general parts with modified numbering were published after this part was issued, the clause numbers referring to a general part in this 721 part may no longer align with the latest edition of the general part. Dated references should be observed.



## 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 electrical installations in 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 purposes of this document, caravans and motor caravans are referred to as "caravans"

The particular requirements of some parts from the IEC 60364-7 series can also apply to such installations in caravans, for example IEC 60364-7-701.

##### 721.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 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 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 (all parts), *Conduit systems for cable management*

IEC 62423, *Type F and Type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses*

## 721.3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

### 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

#### 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**

factory produced relocatable dwelling

## 721.31 Purposes, supplies and structure

### 721.313 Supplies

#### 721.313.1 General

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

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

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

## **721.4 Protection for safety**

### **721.41 Protection against electric shock**

#### **721.410.3.5**

*Add the following:*

The protective measures of obstacles and placing out of reach as specified in Annex B of IEC 60364-4-41:2005 shall not be used.

#### **721.410.3.6**

*Add the following:*

The protective measures of non-conducting locations and earth-free local equipotential bonding as specified in Annex C of IEC 60364-4-41:2005 shall not be used.

NOTE This precludes the use of class 0 equipment.

### **721.411 Protective measure: automatic disconnection of supply**

#### **721.411.3.1.2 Protective equipotential bonding**

Metal frame parts or thereto connected construction parts shall be connected through main protective bonding conductors to the main earthing terminal within the caravan.

### **721.413 Protective measure: electrical separation**

The protective measure: electrical separation shall not be used, except for a shaver socket-outlet.

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### **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 DC power sources, a maximum of 48 V are allowed. In exceptional cases, when AC extra-low voltage is required, the voltage (rms) is not allowed to exceed 48 V.

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

### **721.415 Additional protection**

#### **721.415.101 Additional protection: residual current protective devices (RCDs)**

*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, IEC 61009-1 or IEC 62423 breaking all live conductors, shall be provided. Each supply inlet shall be directly connected to its associated RCD.

NOTE This implies that there cannot be any taps or junctions in this connection.

Consideration should be given to the characteristics of the load in selection of the type of RCD.

## **721.43 Protection against overcurrent**

### **721.43.101 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) such that supplies at different voltages cannot be interconnected.

NOTE Independent installations. An installation is an assembly of associated electrical equipment having co-ordinated characteristics to fulfil specific purposes.

#### **721.512 Operational conditions and external influences**

##### **721.512.2 External influences**

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

#### **721.514 Identification**

##### **721.514.1 General**

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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(es);
- the text of the instructions of Annex A.
- additional instructions necessary for user maintenance.

## **721.52 Wiring systems**

### **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 seven 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 61386 (all parts).

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

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

### **721.522.7 Vibration (AH)**

**721.522.7.1** As the wiring will be subjected to vibration, all wiring shall be protected against mechanical damage either by location or by enhanced mechanical protection. Wiring passing through metalwork shall be protected by means of suitable bushes or grommets, securely fixed in position. Precautions shall be taken to avoid mechanical damage due to sharp edges or abrasive parts.

### **721.522.8 Other mechanical stresses (AJ)**

**721.522.8.1.3** All cables, unless enclosed in rigid conduit, trunking, or 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 mm<sup>2</sup> copper or copper equivalent.

### **721.526 Electrical connections**

#### **721.526.1.101 Addition:**

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

NOTE Connections also include junctions and taps.  
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### **721.528 Proximity of wiring systems to other services**

#### **721.528.3 Proximity to non-electrical services**

##### **721.528.3.1**

*Add the following at the end of 528.3.1:*

No electrical equipment including wiring systems, except:

- a) ELV (extra low voltage) equipment for gas supply control;
- b) cables running through a gas compartment without connection shall be installed in any gas cylinder compartment.

Such electrical installations and components shall be constructed and installed so that they are not a potential source of ignition.

Where cables have to run through such a compartment such cables shall be protected against mechanical damage by installation within a continuous conduit or duct passing through the compartment at a height of not less than 500 mm above the base of the cylinders.

Where installed in a position where it is likely to be subject to mechanical damage this conduit or duct shall be able to withstand an impact equivalent to AG3.721.53 isolation, switching and control.

## **721.53 Isolation, switching and control**

### **721.536 Isolation and switching**

#### **721.536.2 Isolation**

**721.536.2.1.1** Each independent installation shall be provided with its own main isolating switch which shall disconnect all live conductors and which shall be suitably placed in a readily accessible location in 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.

**721.536.2.1.1.101** 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.

## **721.54 Earthing arrangements and protective conductors**

### **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 or trunking together with the live conductors.

#### **721.544.1 Protective bonding conductors for connection to the main earthing terminal**

**721.544.1.101** The terminations of protective bonding conductors connecting the conductive structure of the unit shall be accessible and protected against corrosion.

### **721.55 Other equipment**

#### **721.55.2 General requirements**

##### **721.55.2.101 Inlets**

**721.55.2.101.1** Any AC electrical inlet on the caravan shall be an appliance inlet complying with IEC 60309-2.

**721.55.2.101.2** The inlet, if any, shall be installed

- a) not more than 1,8 m above ground level,
- b) in a readily accessible position,
- 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.

##### **721.55.2.102 Accessories**

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

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

**721.55.2.102.3** 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 IPX4.

**721.55.2.102.4** 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.

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

**721.55.2.102.6**

**Table 721.1 – Cross-sectional areas of flexible cords and cables for caravan connection**

Rated current A	Minimum cross-sectional area mm <sup>2</sup>
16	2,5
25	4
32	6
63	16
100	35

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The appliance inlet installed under 721.55.2.101 shall comply with IEC 60309-2, and the means of connection to the caravan pitch socket-outlet 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) continuous length,
  - of harmonized code designation IEC 60245 (code 57) or equivalent,
  - incorporating a protective conductor, with a colour identification according to the appropriate IEC standard, and
  - with a cross-sectional area in accordance with Table 721.1, and
- c) a connector complying with IEC 60309-2.

The means of connection to the caravan pitch socket-outlet need not be supplied with the caravan.