IEC 60364-7-709

Edition 2.1 2012-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Low-voltage electrical installations –
Part 7-709: Requirements for special installations or locations – Marinas and similar locations

Installations électriques à basse tension –
Partie 7-709: Exigences pour les installations ou emplacements spéciaux – Marinas et emplacements analogues

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CONTENTS

FOREWORD 3
INTRODUCTION 5

709 Marinas and similar locations 6
709.1 Scope 6
709.2 Normative references 6
709.3 Terms and definitions 6
709.31 Purposes, supplies and structure 7
709.312 Conductor arrangement and system earthing 7
709.313 Supplies 7
709.4 Protection for safety 7
709.41 Protection against electric shock 7
709.413 Protective measure: electrical separation 8
709.5 Selection and erection of electrical equipment 8
709.512 Operational conditions and external influences 8
709.521 Types of wiring systems 9
709.533 Devices for protection against overcurrent 10
709.536 Isolation and switching 10
709.55 Other equipment 11

Annex A (informative) Examples of methods of obtaining supply in marinas 12
Annex B (informative) Example of an instruction notice to be placed in marinas 15
Annex C (informative) List of notes concerning certain countries 16

Bibliography 17

Figure 709A.1 – Direct connection to a single phase mains supply 12
Figure 709A.2 – Direct connection to a single phase mains supply with an isolating transformer on the vessel 12
Figure 709A.3 – Direct connection to a three phase mains supply 13
Figure 709A.4 – Direct connection to a three phase mains supply with an isolating transformer on the vessel 13
Figure 709A.5 – Connection to a single phase supply through a shore-mounted isolating transformer 14

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

Part 7-709: Requirements for special installations or locations – Marinas and similar locations

FOREWORD

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This consolidated version of IEC 60364-7-709 consists of the second edition (2007) [documents 64/1573/FDIS and 64/1588/RVD] and its amendment 1 (2012) [documents 64/1811/FDIS and 64/1817/RVD]. It bears the edition number 2.1.

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience. A vertical line in the margin shows where the base publication has been modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through.

International Standard IEC 60364-7-709 has been prepared by IEC technical committee 64: Electrical installations and protection against electric shock.

The major changes with regard to the previous edition concern:

– the removal of the requirements for the electrical installation in pleasure craft as these are now covered by IEC 60092-507;
– the requirements of this part have been aligned with those in other parts of IEC 60364.

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 C 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 the base publication and its amendments will remain unchanged until the stability 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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- replaced by a revised edition, or
- amended.

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INTRODUCTION

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

The clause numbering appearing after 709 refers to the corresponding parts or clauses of IEC 60364, Parts 1 to 6. Numbering of clauses does not, therefore, necessarily follow sequentially. Numbering of figures and tables takes the number of this part followed by a sequential number.

The absence of reference to a part or a clause means that the general requirements contained in Parts 1 to 6 of IEC 60364 are applicable.

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

Part 7-709: Requirements for special installations or locations – Marinas and similar locations

709 Marinas and similar locations

709.1 Scope

The particular requirements specified in this part of IEC 60364 apply only to circuits intended to supply pleasure craft or houseboats in marinas and similar locations.

NOTE 1 In this part “marina” means “marina and similar locations”.

The particular requirements do not apply to the supply of house boats if they are directly supplied from the public network.

The particular requirements do not apply to the internal electrical installations of pleasure craft or house boats.

NOTE 2 For electrical installations of pleasure craft, see IEC 60092-507.

NOTE 3 The electrical installations of house boats should comply with the general requirements of IEC 60364, together with the relevant particular requirements of IEC 60364-7.

For the remainder of the electrical installation of marinas and similar locations the general requirements of IEC 60364 together with the relevant particular requirements of IEC 60364-7 apply.

709.2 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 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-tubes accessories*

IEC 60364-4-43, *Electrical installations of buildings – Part 4-43: Protection for safety – Protection against overcurrent*

IEC 61558-2-4, *Safety of power transformers, power supply units and similar – Part 2: Particular requirements for isolating transformers for general use*

IEC 62262, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

709.3 Terms and definitions

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

709.3.1
pleasure craft
any boat, vessel, yacht, motor launch, houseboat or other floating craft used exclusively for sport or leisure

709.3.2
marina
facility for the mooring of pleasure craft with fixed wharves, jetties, piers or a pontoon arrangement capable of berthing one or more pleasure craft

709.3.3
houseboat
floating decked structure which is designed or adapted for use as a place of permanent residence often kept in one place on inland water

709.31 Purposes, supplies and structure

709.312 Conductor arrangement and system earthing

709.312.2 Types of system earthing

709.312.2.1 TN-systems

Add the following:

For a TN-system, the final circuits for the supply of pleasure craft or houseboats shall not include a PEN conductor.

709.313 Supplies

709.313.1.2

Add the following:

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

The nominal supply voltage shall not exceed 230 V single-phase, or 400 V three-phase.

709.4 Protection for safety

709.41 Protection against electric shock

709.411.2 Requirements for basic protection

709.41.B.2 Obstacles

Protection by obstacles shall not be used.

709.41.B.3 Placing out of reach

Protection by placing out of reach shall not be used.

709.41.C.1 Non-conducting location

Protection by non-conducting location shall not be used.

NOTE This precludes the use of class 0 equipment.

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

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

709.413 Protective measure: electrical separation

Where the protective measure of electrical separation is used for supplying pleasure craft compliance with all the requirements of Clause 413 and with 709.413.3.2 and 709.413.3.6 shall be ensured.

709.413.3.2 The circuit shall be supplied through a fixed isolating transformer complying with IEC 61558-2-4.

The protective conductor of the supply to the isolating transformer shall not be connected to the earth terminal in the socket-outlet supplying the pleasure craft.

NOTE See Annex A.

709.413.3.6

Add the following:

The equipotential bonding of the pleasure craft shall not be connected to the protective conductor of the shore supply.

709.5 Selection and erection of electrical equipment

709.512 Operational conditions and external influences

709.512.2 External influences

Add the following:

NOTE For marinas particular attention is given in this part to the likelihood of corrosive elements, movement of structures, mechanical damage, presence of flammable fuel and the increased risk of electric shock due to

– presence of water;
– reduction in body resistance;
– contact of the body with earth potential.

709.512.2.1.1 Presence of water (AD)

In marinas, equipment installed on or above a jetty, wharf, pier or pontoon shall be selected as follows, according to the external influences which may be present:

– water splashes (AD4): IPX4;
– water jets (AD5): IPX5;
– water waves (AD6): IPX6.

709.512.2.1.2 Presence of solid foreign bodies (AE)

Equipment installed on or above a jetty, wharf, pier or pontoon shall be selected with a degree of protection of at least IP4X in order to protect against the ingress of very small objects (AE3).

709.512.2.1.3 Presence of corrosive or polluting substances (AF)

Equipment installed on or above a jetty, wharf, pier or pontoon shall be suitable for use in the presence of atmospheric corrosive or polluting substances (AF2). If hydrocarbons are present AF3 is applicable.

709.512.2.1.4 Impact (AG)

Equipment installed on or above a jetty, wharf, pier or pontoon shall be protected against mechanical damage (impact of medium severity AG2). Protection shall be afforded by one or more of the following:

– the position or location of the equipment shall be selected to avoid being damaged by any reasonably foreseeable impact;

– local or general mechanical protection shall be provided;

– equipment shall be installed which complies with a minimum degree of protection for external mechanical impact of IK07 (See IEC 62262).

709.521 Types of wiring systems

709.521.7 Wiring systems of marinas

709.521.7.1 The following wiring systems are suitable for distribution circuits in marinas:

a) underground cables;

b) overhead cables or overhead insulated conductors;

c) cables with copper conductors and thermoplastic or elastomeric insulation and installed within an appropriate cable management system taking into account external influences such as movement, impact, corrosion and ambient temperature;

d) mineral-insulated cables with PVC protective covering;

e) armoured cables with a thermoplastic or elastomeric covering;

f) other cables and materials that are no less suitable than those listed under a), b), c), d) or e) above.

709.521.7.2 The following wiring systems shall not be used on or above a jetty, wharf, pier or pontoon:

a) overhead cables and overhead conductors in free air suspended from or incorporating a support wire, e.g. as installation method N^{os}. 35 and 36 in Table 52-3 of IEC 60364-5-52;

b) insulated conductors in conduits, trunking etc., e.g. as installation methods N^{os}. 4 and 6 in Table 52-3 of IEC 60364-5-52;

c) cables with aluminium conductors;

d) mineral-insulated cables.

709.521.7.3 Cables and cable management systems shall be selected and installed so that mechanical damage due to tidal and other movement of floating structures is prevented.

Cable management systems shall be installed to allow the drainage of water/condensate e.g. by sloping way and/or drainage holes.

709.521.7.4 Underground cables

Underground distribution circuits shall, unless provided with additional mechanical protection be buried at a sufficient depth to avoid being damaged, e.g. by movement of vehicles.

NOTE 1 A depth of 0,5 m is generally considered as a minimum depth to fulfil this requirement.

NOTE 2 For conduit systems buried underground, see IEC 61386-24.

709.521.7.5 Overhead cables or overhead insulated conductors

All overhead conductors shall be insulated.

Poles and other supports for overhead wiring shall be located or protected so that they are unlikely to be damaged by any foreseeable movement of vehicles.

Overhead conductors shall be at a height above ground of not less than 6 m in all areas subjected to movement of vehicles movement and 3,5 m in all other areas.

709.53.1 Devices for protection against indirect contact by automatic disconnection of supply

709.531.2 Residual current protective devices (RCD's)

Add the following:

~~Every socket-outlet shall be individually protected by an RCD having a rated residual operating current not exceeding 30 mA. The RCD selected shall disconnect all poles, including the neutral.~~

Every socket-outlet with a rated current up to 63 A shall be individually protected by an RCD having a rated residual operating current not exceeding 30 mA. The RCD selected shall disconnect all poles, including the neutral.

Every socket-outlet with a rated current above 63 A shall be individually protected by an RCD having a rated residual operating current not exceeding 300 mA. The RCD selected shall disconnect all poles, including the neutral.

Account should be taken of the need for selectivity, e.g. by the use of Type S.

Every final circuit intended for the fixed connection of a supply to a house boat shall be protected individually by an RCD having a rated residual operating current not exceeding 30 mA. The RCD selected shall disconnect all poles, including the neutral.

709.533 Devices for protection against overcurrent

In addition the following applies:

Each socket–outlet shall be individually protected by an overcurrent protective device, in accordance with the requirements of IEC 60364-4-43.

Every final circuit intended for the fixed connection of a supply to a house boat shall be individually protected by an overcurrent protective device, in accordance with the requirements of IEC 60364-4-43.

709.536 Isolation and switching

709.536.2 Isolation

709.536.2.1 General

709.536.2.1.1 At least one means of isolation shall be installed in each distribution board. This device shall disconnect all live conductors including the neutral conductor.