Low-voltage electrical installations –

Part 1:
Fundamental principles, assessment of general characteristics, definitions

This English-language version is derived from the original bilingual publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.
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Part 1:
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CONTENTS

FOREWORD

11 Scope

12 Normative references

13 Fundamental principles

13.1 Protection for safety

13.1.1 General

13.1.2 Protection against electric shock

13.1.3 Protection against thermal effects

13.1.4 Protection against overcurrent

13.1.5 Protection against fault currents

13.1.6 Protection against voltage disturbances and measures against electromagnetic influences

13.1.7 Protection against power supply interruption

13.2 Design

13.2.1 General

13.2.2 Characteristics of available supply or supplies

13.2.3 Nature of demand

13.2.4 Electric supply systems for safety services or standby electric supply systems

13.2.5 Environmental conditions

13.2.6 Cross-sectional area of conductors

13.2.7 Type of wiring and methods of installation

13.2.8 Protective equipment

13.2.9 Emergency control

13.2.10 Disconnecting devices

13.2.11 Prevention of mutual detrimental influence

13.2.12 Accessibility of electrical equipment

13.2.13 Documentation for the electrical installation

13.3 Selection of electrical equipment

13.3.1 General

13.3.2 Characteristics

13.3.3 Conditions of installation

13.3.4 Prevention of harmful effects

13.4 Erection and verification of electrical installations

13.4.1 Erection

13.4.2 Initial verification

13.4.3 Periodic verification

20 Terms and definitions

30 Assessment of general characteristics

31 Purposes, supplies and structure

31.1 Maximum demand and diversity

31.2 Conductor arrangement and system earthing

31.2.1 Current-carrying conductors depending on kind of current

31.2.2 Types of system earthing
313 Supplies................................................................................................................71
   313.1 General .......................................................................................................71
   313.2 Supplies for safety services and standby systems ..................................71
314 Division of installation.......................................................................................71
32 Classification of external influences..................................................................73
33 Compatibility ........................................................................................................73
   33.1 Compatibility of characteristics.................................................................73
   33.2 Electromagnetic compatibility .................................................................73
34 Maintainability ....................................................................................................73
35 Safety services......................................................................................................75
   35.1 General .......................................................................................................75
   35.2 Classification .............................................................................................75
36 Continuity of service............................................................................................75

Annex A (informative) Numbering system and plan of IEC 60364 series ..............77
Annex B (informative) Definitions – Application guide and explanations to selected
terms of IEC 60050-826 (IEV 826 – Electrical Installations) ...............................83
and IEC 60364-1 fifth edition 2005 ....................................................................89

Bibliography .............................................................................................................93

Figure 1 – Single-phase 2-wire ..............................................................................35
Figure 2 – Single-phase 3-wire ..............................................................................35
Figure 3 – Two-phase 3-wire ..................................................................................35
Figure 4 – Three-phase 3-wire ...............................................................................35
Figure 5 – Three-phase 4-wire ...............................................................................37
Figure 6 – 2-wire ....................................................................................................37
Figure 7 – 3-wire ....................................................................................................37
Figure 31A1 – TN-S system with separate neutral conductor and protective conductor
throughout the system .........................................................................................39
Figure 31A2 – TN-S system with separate earthed line conductor and protective
conductor throughout the system ........................................................................41
Figure 31A3 – TN-S system with earthed protective conductor and no distributed
neutral conductor throughout the system ............................................................41
Figure 31B1 – TN-C-S system 3-phase, 4-wire, where the PEN is separated into PE
and N elsewhere in the installation .......................................................................43
Figure 31B2 – TN-C-S system 3-phase, 4-wire where the PEN is separated into PE
and N at the origin of the installation ....................................................................45
Figure 31B3 – TN-C-S system – Single-phase, 2-wire where the PEN is separated into
PE and N at the origin of the installation ...............................................................45
Figure 31C – TN-C system with neutral and protective conductor functions combined in
a single conductor throughout the system .............................................................47
Figure 31D – TN-C-S multiple source system with separate protective conductor and
neutral conductor to current using equipment .......................................................49
Figure 31E – TN multiple source system with protective conductor and no neutral
conductor throughout the system for 2- or 3-phase load .......................................51
Figure 31F1 – TT system with separate neutral conductor and protective conductor throughout the installation.................................................................53
Figure 31F2 – TT system with earthed protective conductor and no distributed neutral conductor throughout the installation ......................................................55
Figure 31G1 – IT system with all exposed-conductive-parts interconnected by a protective conductor which is collectively earthed ..................................................57
Figure 31G2 – IT system with exposed-conductive-parts earthed in groups or individually................................................................................................................59
Figure 31H – TN-S d.c. system ........................................................................................................61
Figure 31J – TN-C d.c. system .......................................................................................................63
Figure 31K – TN-C-S d.c. system ..................................................................................................65
Figure 31L – TT d.c. system .........................................................................................................67
Figure 31M – IT d.c. system ..........................................................................................................69
Figure B.1 – Zone of arm’s reach ...............................................................................................85

Table A.1 – Numbering system of IEC 60364 series................................................................77
Table A.2 – Plan of IEC 60364 series: Electrical installations of buildings .........................79
FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.

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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60364-1 has been prepared by IEC Technical Committee 64: Electrical installations and protection against electric shock.


The main changes with respect to the previous edition are:

- in order to complete the scope, the new items external lighting and similar installations, medical locations, mobile or transportable units, photovoltaic power supply units and low-voltage generating sets are added;
- in Clause 131, "Fundamental principles", the list of hazards which may arise in electrical installations is completed; furthermore, a new subclause dealing with protection against voltage disturbances and measures against electromagnetic influences and a new subclause dealing with protection against power supply interruption are added;
in Clause 132, "Design", the new subclause "Documentation for the electrical installation" is added;

in Clause 134, "Erection and verification of electrical installations", the new subclause "periodic verification" is added;

the former Clause 312, "Types of distribution system" is renamed "Conductor arrangement and system earthing" and, in the relevant subclauses, several new figures are included for better understanding of the different kind of a.c. and d.c. circuits and types of systems and their earthing being applied nowadays in IEC member countries;

in 33.1, "Compatibility of characteristics", a new item for excessive PE conductor currents is added;

a new Clause 36, "Continuity of service", is included;


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

<table>
<thead>
<tr>
<th>FDIS</th>
<th>Report on voting</th>
</tr>
</thead>
<tbody>
<tr>
<td>64/1488/FDIS</td>
<td>64/1499/RVD</td>
</tr>
</tbody>
</table>

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.

IEC 60364 consists of the following parts, under the general title Low-voltage electrical installations:

Part 1: Fundamental principles, assessment of general characteristics, definitions
Part 4: Protection for safety
Part 5: Selection and erection of electrical equipment
Part 6: Verification
Part 7: Requirements for special installations or locations

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

• reconfirmed;
• withdrawn;
• replaced by a revised edition, or
• amended.
11 Scope

IEC 60364-1 gives the rules for the design, erection, and verification of electrical installations. The rules are intended to provide for the safety of persons, livestock and property against dangers and damage which may arise in the reasonable use of electrical installations and to provide for the proper functioning of those installations.

11.1 IEC 60364-1 applies to the design, erection and verification of electrical installations such as those of

a) residential premises;
b) commercial premises;
c) public premises;
d) industrial premises;
e) agricultural and horticultural premises;
f) prefabricated buildings;
g) caravans, caravan sites and similar sites;
h) construction sites, exhibitions, fairs and other installations for temporary purposes;
i) marinas;
j) external lighting and similar installations (see, however, 11.3e));
k) medical locations;
l) mobile or transportable units;
m) photovoltaic systems;
n) low-voltage generating sets.

NOTE “Premises” covers the land and all facilities including buildings belonging to it.

11.2 IEC 60364-1 covers

a) circuits supplied at nominal voltages up to and including 1 000 V a.c. or 1 500 V d.c.;

For a.c., the preferred frequencies which are taken into account in this standard are 50 Hz, 60 Hz and 400 Hz. The use of other frequencies for special purposes is not excluded.

b) circuits, other than the internal wiring of apparatus, operating at voltages exceeding 1 000 V and derived from an installation having a voltage not exceeding 1 000 V a.c., for example, discharge lighting, electrostatic precipitators;

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1 The numbering system is explained in Annex A.
c) wiring systems and cables not specifically covered by the standards for appliances;
d) all consumer installations external to buildings;
e) fixed wiring for information and communication technology, signalling, control and the like (excluding internal wiring of apparatus);
f) the extension or alteration of the installation and also parts of the existing installation affected by the extension or alteration.

NOTE The rules of IEC 60364-1 are intended to apply to electrical installations generally but, in certain cases, they may need to be supplemented by the requirements or recommendations of other IEC standards (for example, for installations in explosive gas atmospheres).

11.3 IEC 60364-1 does not apply to
a) electric traction equipment, including rolling stock and signaling equipment;
b) electrical equipment of motor vehicles, except those covered in Part 7;
c) electrical installations on board ships and mobile and fixed offshore platforms;
d) electrical installations in aircraft;
e) public street-lighting installations which are part of the public power grid;
f) installations in mines and quarries;
g) radio interference suppression equipment, except where it affects the safety of the installation;
h) electric fences;
i) external lightning protection systems for buildings (LPS);

NOTE Atmospheric phenomena are covered in IEC 60364-1 but only insofar as effects on the electrical installations are concerned (for example, with respect to selection of surge protective devices).

j) certain aspects of lift installations;
k) electrical equipment of machines.

11.4 IEC 60364-1 is not intended to apply to
– systems for distribution of energy to the public, or
– power generation and transmission for such systems.

NOTE 1 Countries wishing to do so may, however, use this standard in whole or in part for that purpose.

NOTE 2 According to IEC 61936 which provides common rules for the design and the erection of electrical power installations in systems with nominal voltages above 1kV a.c. and nominal frequency up to and including 60 Hz, low-voltage a.c. and d.c. protection and monitoring systems should be in accordance with IEC 60364 series.

11.5 Electrical equipment is dealt with only so far as its selection and application in the installation are concerned.

This applies also to assemblies of electrical equipment complying with the relevant standards.
12 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 60050(691), International Electrotechnical Vocabulary (IEV) – Chapter 691: Tariffs for electricity

IEC 60050-826, International Electrotechnical Vocabulary (IEV) – Part 826: Electrical installations

IEC 60364-4-41, Electrical installations of buildings – Part 4-41: Protection for safety – Protection against electric shock

IEC 60364-4-42, Electrical installations of buildings – Part 4-42: Protection for safety – Protection against thermal effects

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

IEC 60364-4-44, Electrical installations of buildings – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances

IEC 60364-5-51, Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules

IEC 60364-5-52, Electrical installations of buildings – Part 5-52: Selection and erection of electrical equipment – Wiring systems


IEC 60364-5-54, Electrical installations of buildings – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements, protective conductors and protective bonding conductors


IEC 60445, Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals and of terminations of certain designated conductors, including general rules for an alphanumeric system

IEC 60446, Basic and safety principles for man-machine interface, marking and identification – Identification of conductors by colours or numerals

IEC 60617-DB:2001², Graphical symbols for diagrams

IEC 60721 (all parts), Classification of environmental conditions

² “DB” refers to the IEC on-line database.