INTERNATIONAL STANDARD

IEC 60364-1

Fourth edition
2001-08

Electrical installations of buildings –

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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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL INSTALLATIONS OF BUILDINGS –

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

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The 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 IEC 60364 series (parts 1 to 6), is currently being restructured, without any technical changes, into a more simple form (see annex C).

According to a unanimous decision by the Committee of Action (CA/1720/RV (2000-03-21)), the restructured parts of IEC 60364 have not been submitted to National Committees for approval.

The text of this fourth edition of IEC 60364-1 is compiled from and replaces

– part 1, third edition (1992),
– part 2-21, first edition (1993), and
– part 3, second edition (1993) and its amendments 1 and 2 (1994 and 1995, respectively).

This publication has been drafted, as close as possible, in accordance with the ISO/IEC Directives, Part 3.

Annexes A, B and C are for information only.

The committee has decided that the contents of this publication will remain unchanged until 2003. At this date, the publication will be

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

INTRODUCTION

This part of IEC 60364 contains the rules for the design and erection of electrical installations so as to provide safety and proper functioning for the use intended.

Clause 13 states the fundamental principles. It does not include detailed technical requirements which may be subject to modifications on account of technical developments.

Parts 1 to 7 of IEC 60364 deal with technical requirements, the observance of which is intended to ensure that electrical installations conform to the fundamental principles of clause 13.

ELECTRICAL INSTALLATIONS OF BUILDINGS –

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

11 Scope[1]

11.1 This part of IEC 60364 applies to 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 temporary installations;
i) marinas and pleasure craft.

11.2 It 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., e.g. discharge lighting, electrostatic precipitators;
c) any wiring systems and cables not specifically covered by the standards for appliances;
d) all consumer installations external to buildings;
e) fixed wiring for telecommunications, 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.

11.3 The standard does not apply to

a) electric traction equipment;
b) electrical equipment of motor vehicles;
c) electrical installations on board ships;
d) electrical installations in aircraft;
e) public street-lightning installations;
f) installations in mines;

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[1] The numbering system is explained in annex A.

g) radio interference suppression equipment, except so far as it affects safety of the installation;

h) electric fences;

i) lightning protection of buildings.

NOTE Atmospheric phenomena are covered, however, in so far as effects on the electrical installations are concerned (e.g. with respect to selection of lightning arresters).

11.4 This standard is not intended to apply to:

– systems for distribution of energy to the public, or

– power generation and transmission for such systems.

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

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

This applies also to assemblies of electrical equipment complying with the relevant standards.

11.6 An assessment is made of the following characteristics of the installation in accordance with the clauses indicated:

– the purposes for which the installation is intended to be used, its general structure and its supplies (clause 31);

– the external influences to which it is to be exposed (IEC 60364-5-51);

– the compatibility of its equipment (clause 33);

– its maintainability (clause 34).

Those characteristics shall be taken into account in the choice of methods of protection for safety (see IEC 60364-4-41 to IEC 60364-4-44) and the selection and erection of equipment (see IEC 60364-5-51 to IEC 60364-5-55).

NOTE For telecommunications installations, account should be taken of any IEC standards as well as publications of the ITU-T and the ITU-R relevant to the type of installation concerned.

12 (3.2)[2] Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60364. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60364 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(826):1982, *International Electrotechnical Vocabulary – Chapter 826: Electrical installations of buildings*

IEC 60364-4-41:2001, *Electrical installations of buildings – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-42:2001, *Electrical installations of buildings – Part 4-42: Protection for safety – Protection against thermal effects*

[2] In this standard, references in brackets refer to the previous numbering system.

IEC 60364-4-43:2001, *Electrical installations of buildings – Part 4-43: Protection for safety – Protection against overcurrent*

IEC 60364-4-44:2001, *Electrical installations of buildings – Part 4-44: Protection for safety – Protection against electromagnetic and voltages disturbances*

IEC 60364-5-51:2001, *Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules*

IEC 60364-5-52:2001, *Electrical installations of buildings – Part 5-52: Selection and erection of electrical equipment – Wiring systems*

IEC 60364-5-53:2001, *Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control*

IEC 60364-5-54, *Electrical installations of buildings – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements* [3]

IEC 60364-5-55:2001, *Electrical installations of buildings – Part 5-55: Selection and erection of electrical equipment – Other equipment*

IEC 60446:1999, *Basic and safety principles for man-machine interface, marking and identification – Identification of conductors by colours or numerals*

IEC 60617-11:1996, *Graphical symbols for diagrams – Part 11: Architectural and topographical installation plans and diagrams*

IEC 60721 (all parts), *Classification of environmental conditions*

13 Fundamental principles

NOTE Where countries not yet having national regulations for electrical installations deem it necessary to establish legal requirements for this purpose, it is recommended that such requirements be limited to fundamental principles which are not subject to frequent modification on account of technical development. The contents of clause 13 may be used as a basis for such legislation.

131 Protection for safety

131.1 General

The requirements stated in this subclause are intended to ensure the safety of persons, livestock and property against dangers and damage which may arise in the reasonable use of electrical installations.

NOTE In electrical installations, two major types of risk exist:

– shock currents;

– excessive temperatures likely to cause burns, fires and other injurious effects.

131.2 Protection against electric shock

131.2.1 Protection against direct contact

Persons and livestock shall be protected against dangers that may arise from contact with live parts of the installation.

[3] To be published.

This protection can be achieved by one of the following methods:

– preventing a current from passing through the body of any person or any livestock;

– limiting the current which can pass through a body to a value lower than the shock current.

131.2.2 Protection against indirect contact

Persons and livestock shall be protected against dangers that may arise from contact with exposed-conductive-parts in case of a fault.

This protection can be achieved by one of the following methods:

– preventing a fault current from passing through the body of any person or any livestock;

– limiting the fault current which can pass through a body to a value lower than the shock current;

– automatic disconnection of the supply in a determined time on the occurrence of a fault likely to cause a current to flow through a body in contact with exposed-conductive-parts, where the value of that current is equal to or greater than the shock current.

NOTE In connection with the protection against indirect contact, the application of the method of equipotential bonding is one of the important principles for safety.

131.3 Protection against thermal effects

The electrical installation shall be so arranged that there is no risk of ignition of flammable materials due to high temperature or electric arc. In addition, during normal operation of the electrical equipment, there shall be no risk of persons or livestock suffering burns.

131.4 Protection against overcurrent

Persons or livestock shall be protected against injury and property shall be protected against damage due to excessive temperatures or electromechanical stresses caused by any overcurrents likely to arise in live conductors.

This protection can be achieved by one of the following methods:

– automatic disconnection on the occurrence of an overcurrent before this overcurrent attains a dangerous value taking into account its duration;

– limiting the maximum overcurrent to a safe value and duration.

131.5 Protection against fault currents

Conductors, other than live conductors, and any other parts intended to carry a fault current shall be capable of carrying that current without attaining an excessive temperature.

NOTE 1 Particular attention should be given to earth fault currents and leakage current.

NOTE 2 For live conductors, compliance with 131.4 assures their protection against overcurrents caused by faults.

131.6 Protection against overvoltage

131.6.1 Persons or livestock shall be protected against injury and property shall be protected against any harmful effects as a consequence of a fault between live parts of circuits supplied at different voltages.