

FINAL VERSION

VERSION FINALE

**Low-voltage electrical installations –
Part 5-54: Selection and erection of electrical equipment – Earthing
arrangements and protective conductors**

**Installations électriques à basse tension –
Partie 5-54: Choix et mise en œuvre des matériels électriques – Installations
de mise à la terre et conducteurs de protection**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors

FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 60364-5-54 edition 3.1 contains the third edition (2011-03) [documents 64/1755/FDIS and 64/1766/RVD] and its amendment 1 (2021-04) [documents 64/2479/FDIS and 64/2481/RVD].

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

International Standard IEC 60364-5-54 has been prepared by IEC technical committee 64: Electrical installations and protection against electric shock.

This third edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- clarification of the definition of protective conductor;
- improved specification of mechanical characteristics of the earth electrode;
- introduction of earth electrode for protection against electric shock and lighting protection;
- annexes describing concrete-embedded foundation earth electrodes and soil-embedded earth electrode.

It has the status of a basic safety publication in accordance with IEC Guide 104.

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 E 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 parts in the IEC 60364 series, under the general title: *Low-voltage electrical installations*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendment 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

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- withdrawn,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

INTRODUCTION

Clause numbering is sequential, preceded by the number of this Part. Numbering of figures and tables takes the number of this part followed by a sequential number, i.e. Table 54.1, 54.2, etc. Numbering of figures and tables in annexes takes the letter of the annex, followed by the number of the part, followed by a sequential number, e.g. A.54.1, A.54.2, etc.

To define a clear borderline between functional earthing and protective earthing the following explanations are given:

Functional earthing

- Functional earthing

If any connection of the functional earthing is interrupted, it does not impair any kind of protection or any kind of protective measure or protective provision provided for electrical safety. Therefore, its application mainly relates to:

- communication,
- measurement, and
- EMC as regards radiated disturbances and conducted high frequency disturbances.

- Protective earthing

If any connection of the protective earthing is interrupted, it impairs the protection or the function of a protective measure or protective provision provided for electrical safety.

Requirement for protective earthing are given in:

- IEC 60364-4-41 for protection against electric shock;
- IEC 60364-4-42 for protection against thermal effects;
- IEC 60364-4-44 for protection against conducted disturbances.

INTRODUCTION to Amendment 1

The main changes provided in this Amendment 1 are:

- clarification and necessary modifications to define a clear borderline between functional earthing and protective earthing (see INTRODUCTION);
- introduction of additional requirements for functional earthing and functional-equipotential-bonding for information technology systems and communication equipment (ICT).

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors

541 General

541.1 Scope

This part of IEC 60364 addresses the earthing arrangements and protective conductors including protective bonding conductors in order to satisfy the safety of the electrical installation.

This document also includes requirements regarding earthing and equipotential bonding for information and communication technology (ICT) with the aim of:

- reducing the risk of electrical hazards for correct operation of these devices and the information and communication technology wiring;
- providing the telecommunication systems with a reliable signal reference plane that can improve resistance to electromagnetic interference (EMI) by reference to ISO/IEC 30129.

NOTE Examples of information and communication technology (ICT) include:

- DC supply networks (and systems) for supplying power to ICT equipment within a building;
- star-shaped private automatic branch exchanges (PABX) or their equipment;
- local area (communication) networks (LANs);
- fire and intruder alarms communication systems;
- building automation systems, e.g. direct digital control systems;
- systems for computer-aided manufacturing (CAM) and other computer-aided services;
- broadcast and communication technology.

541.2 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 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60364-5-51:2005, *Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules*

IEC 60417, *Graphical symbols for use on equipment* (available at <http://www.graphical-symbols.info/equipment>)

IEC 60439-2, *Low-voltage switchgear and controlgear assemblies – Part 2: Particular requirements for busbar trunking systems (busways)*

IEC 60445, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*