

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Residual current-operated protective devices (RCDs) for household and similar use – Electromagnetic compatibility

Dispositifs différentiels résiduels (DDR) pour usages domestique et analogues – Compatibilité électromagnétique



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RESIDUAL CURRENT-OPERATED PROTECTIVE DEVICES (RCDs) FOR
HOUSEHOLD AND SIMILAR USE – ELECTROMAGNETIC COMPATIBILITY**

FOREWORD

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IEC 61543 has been prepared by subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories. It is an International Standard.

This second edition cancels and replaces the first edition published in 1995, Amendment 1:2004 and Amendment 2:2005. This edition constitutes a technical revision.

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

- a) some editorial modifications were introduced to comply to the ISO/IEC Directives Part 2:2021, e.g. introduction of Clause 3 – Terms and Definitions and renumbering of the whole document. In particular, the numbering of performance criteria has been changed (5.1.1, 5.1.2 become A, B, etc.);
- b) some technical improvements:
 - Modification of scope and addition of Clause 6 and Clause 7 to enable the use of this document as a guideline for the preparation of EMC requirements and tests for other product standards under the scope of SC 23E;
 - Requirements for voltage dips and interruptions added;

- Repetition rate for burst-test, defined at 5 kHz;
- Surge test: Specifying impulse voltage application point and adding of voltages 2 kV, 1 kV and 0,5 kV to test T 5b;
- Radiated radio-frequency electromagnetic field: Adding of frequency range 1,4 GHz to 6 GHz and specifying frequencies for the test at 1,25 $I_{\Delta n}$;
- Conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz: Specifying frequencies for the test at 1,25 $I_{\Delta n}$;
- Electrostatic discharges: Change of performance criteria from 5.1.3 to B.

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

Draft	Report on voting
23E/1268/FDIS	23E/1305/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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

IEC 61543 is product family standard for RCDs Electromagnetic Compatibility and, more generally it is used as a guide for other devices of IEC Subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

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RESIDUAL CURRENT-OPERATED PROTECTIVE DEVICES (RCDs) FOR HOUSEHOLD AND SIMILAR USE – ELECTROMAGNETIC COMPATIBILITY

1 Scope

This international standard provides specific emission and immunity requirements, tests and performance criteria for residual current-operated protective devices (RCDs), for household and similar use, for rated voltages not exceeding 440 V.

Household and similar use corresponds to the description given in the generic standard IEC 61000-6-1 for residential, commercial, and light-industrial electromagnetic environments.

This document is intended to be referred to by RCD product standards and is not intended to be used as a standalone document.

Residual current-operated protective devices are:

- Residual current operated circuit-breakers without integral overcurrent protection for household and similar use (RCCBs) covered by the IEC 61008 series and IEC 62423;
- Residual current operated circuit-breakers with integral overcurrent protection for household and similar use (RCBOs) covered by the IEC 61009 series and IEC 62423;
- Residual current devices with or without overcurrent protection for socket-outlets (SRCDs) covered by IEC 62640;
- Portable residual current devices without integral overcurrent protection (PRCDs) covered by IEC 61540;
- Devices with an RCD functionality for household and similar use according product standards following the group safety publications for general safety requirements for RCDs, IEC 60755.

This edition applies if it is referred to as a dated reference in the relevant product standard.

This document is also intended to be used as a guideline in the preparation of EMC requirements and tests for other product standards under the scope of IEC Subcommittee 23E. It also specifies generic performance criteria intended to be transformed into specific performance criteria by the relevant product standard.

NOTE Examples of other product standards under the scope of SC 23E are:

- IEC 62020-1, Electrical accessories – Residual current monitors (RCMs) – Part 1: RCMs for household and similar uses
- IEC 62606, General requirements for arc fault detection devices
- IEC 63024, Requirements for automatic reclosing devices (ARDs) for circuit breakers, RCBOs-RCCBs for household and similar uses
- IEC 63052, Power frequency overvoltage protective devices (POPs) for household and similar applications
- IEC 62752, In-cable control and protection device for mode 2 charging of electric road vehicles (IC-CPD)
- IEC 62955, Residual direct current detecting device (RDC-DD) to be used for mode 3 charging of electric vehicles

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 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3 : Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*
IEC 61000-4-5:2014/AMD1:2017

IEC 61000-4-6, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-11, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase*

IEC 61000-4-16:2015, *Electromagnetic compatibility (EMC) – Part 4-16: Testing and measurement techniques – Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz*

IEC 61000-4-19, *Electromagnetic compatibility (EMC) – Part 4-19: Testing and measurement techniques – Test for immunity to conducted, differential mode disturbances and signalling in the frequency range 2 kHz to 150 kHz at a.c. power ports*

CISPR 14-1, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 Electromagnetic emission of RCDs

Emission tests are required only for RCDs containing a continuously operating oscillator. The requirements of CISPR 14-1 apply.