



SLOVENSKI STANDARD
oSIST prEN IEC 61543:2021
01-oktober-2021

Zaščitne naprave na preostali (diferenčni) tok za uporabo v gospodinjstvu in podobne namene - Elektromagnetna združljivost

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

Fehlerstromschutzeinrichtungen (RCDs) für Hausinstallationen und ähnliche Verwendung - Elektromagnetische Verträglichkeit

Dispositifs différentiels résiduels (DDR) pour usages domestiques et analogues - Compatibilité électromagnétique

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Ta slovenski standard je istoveten z: prEN IEC 61543:2021

ICS:

29.120.50	Varovalke in druga nadtokovna zaščita	Fuses and other overcurrent protection devices
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

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23E/1235/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 61543 ED2	
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IEC SC 23E : CIRCUIT-BREAKERS AND SIMILAR EQUIPMENT FOR HOUSEHOLD USE	
SECRETARIAT: Italy	SECRETARY: Mr Giovanni Cassinelli
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input checked="" type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING	
<p>Attention IEC-CENELEC parallel voting https://standards.iteh.ai/catalog/standards/sist/da867967-add4-42b5-b914-14c65912f08/draft-pr-en-iec-61543-2021</p> <p>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

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

PROPOSED STABILITY DATE: 2024

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

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 DIR 2 / Ed.7.0, 2016, e.g. introduction of Clause 3 – Terms and Definitions and renumbering of the whole document. In particular, the number of performance criteria has been changed (5.1.1, 5.1.2 becomes A, B, etc...);
- b) some technical improvements

- 77 • Modification of scope and addition of clause 6 and clause 7 to enable the use of this
78 document as a guideline for the preparation of EMC requirements and tests for other
79 product standards under the scope of 23E.
- 80 • Requirements for voltage dips and interruptions added
- 81 • Repetition rate for burst-test, defined at 5 kHz
- 82 • Surge test: Specifying of impulse voltage application point and adding of voltages
83 2,5 kV, 1 kV and 0,5kV to test T5b)
- 84 • Radiated radio-frequency electromagnetic field: Adding of frequency range 1,4 - 6
85 GHz and specifying frequencies for the test at $1,25 I_{\Delta n}$
- 86 • Conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz:
87 Specifying frequencies for the test at $1,25 I_{\Delta n}$
- 88 • Electrostatic discharges: Change of performance criteria from 5.1.3 to B

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

FDIS	Report on voting
23E/XX/FDIS	23E/XX/RVD

90
91 Full information on the voting for the approval of this International Standard can be found in the
92 report on voting indicated in the above table.

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93 This document has been drafted in accordance with the ISO/JEC Directives, Part 2.

94 The committee has decided that the contents of this document will remain unchanged until the
95 stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to
96 the specific document. At this date, the document will be

- 97 • reconfirmed,
98 • withdrawn,
99 • replaced by a revised edition, or
100 • amended.

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INTRODUCTION

104 IEC 61543 is product family standard for RCDs Electromagnetic Compatibility and, more
105 generally it is used as a guide for other devices of the SC23E.

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106 **RESIDUAL CURRENT-OPERATED PROTECTIVE DEVICES (RCDS) FOR**
 107 **HOUSEHOLD AND SIMILAR USE –**

108

109

ELECTROMAGNETIC COMPATIBILITY

110

111 **1 Scope**

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

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

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

119 Residual current-operated protective devices are:

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

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

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

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

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

146 2 Normative references

147 The following documents are referred to in the text in such a way that some or all of their content
148 constitutes requirements of this document. For dated references, only the edition cited applies.
149 For undated references, the latest edition of the referenced document (including any
150 amendments) applies.

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

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

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

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

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

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

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

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

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

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

174 3 Terms and definitions

175 No terms and definitions are listed in this document.

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

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

180

181 4 Electromagnetic emission of RCDs

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

184 RCDs other than those containing a continuously operating oscillator do not usually generate
185 continuous or transient disturbances except during their switching process. The frequency, the
186 level and the consequences of such emissions are considered as part of the normal
187 electromagnetic environment of low- voltage installations.

188 **5 Electromagnetic immunity of RCDs**

189 **5.1 General**

190 Unless otherwise stated, the tests are made at rated voltage without load, and, for residual
191 current devices fitted with an FE, the FE is connected to the supply neutral.

192 **5.2 Performance criteria for RCDs**

193 For safety reasons, some tests levels and test specifications have been chosen at levels
194 higher than those required by the generic standard. The performance criteria A, B and C listed
195 below apply.

196 A: During the test referring to this performance criterion, the RCD shall remain closed at
197 continuously applied residual current of $0,3 I_{\Delta n}$ and shall trip at $1,25 I_{\Delta n}$.

198 B: During the tests referring to this performance criterion, the RCD shall not trip. After the test,
199 verification of correct operation in case of sudden appearance of sinusoidal AC residual current
200 at $I_{\Delta n}$ only shall be checked, in order to verify that the device operates as intended.

201 C: During the test referring to this performance criterion, the RCD may trip. After the test,
202 with the sample in closed position, verification of correct operation in case of sudden
203 appearance of sinusoidal AC residual current at $I_{\Delta n}$ only shall be checked.

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204 **5.3 Immunity tests**

205 **5.3.1 General**

206 For the immunity tests, Table 1 applies.