



SLOVENSKI STANDARD
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Nizkonapetostne naprave za zaščito pred prenapetostnimi udari - 11. del: Naprave za zaščito pred prenapetostnimi udari za nizkonapetostne AC napajalne sisteme - Zahteve in preskusne metode (fragment 1)

Fragment 1: Low-voltage surge protective devices - Part 11: Surge protective devices connected to AC low-voltage power systems - Requirements and test methods

iTeh Standards

Partie 11: Parafoudres connectés aux systèmes basse tension - Exigences et méthodes d'essai

Document Preview

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ICS:

29.120.50	Varovalke in druga nadtokovna zaščita	Fuses and other overcurrent protection devices
29.240.10	Transformatorske postaje. Prenapetostni odvodniki	Substations. Surge arresters

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en



37A/403/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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IEC SC 37A : LOW-VOLTAGE SURGE PROTECTIVE DEVICES	
SECRETARIAT: United States of America	SECRETARY: Mr Casey Granata
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 37B, TC 64, TC 81, TC 82, TC 109	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 type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input checked="" type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting 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. The CENELEC members are invited to vote through the CENELEC online voting system.	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Fragment 1: Low-voltage surge protective devices - Part 11: Surge protective devices connected to AC low-voltage power systems - Requirements and test methods

PROPOSED STABILITY DATE: 2026

NOTE FROM TC/SC OFFICERS:

This document must be read in conjunction with 37A/401/CDV for IEC 61643-01.

This fragment 1 is the core document. Fragment 2 contains an option for an additional Annex from CLC for Additional requirements for portable SPDs classified as pluggable equipment type A.

Annex E from 37A/368/CD was decided to be shifted to future IEC TR 61643-03, which should be distributed as a DTR in parallel to this CDV.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

**Part 11: Surge protective devices connected
to AC low-voltage power systems –
Requirements and test methods**

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.
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- 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 61643-11 has been prepared by subcommittee 37A: Low-voltage surge protective devices, of IEC technical committee 37: Surge arresters.

This second edition cancels and replaces the first edition published in 2011-03-09, whereby the common requirements for all SPDs are now contained in IEC 61643-01, and this second edition only contains the specific requirements for SPDs for AC applications. This edition constitutes a technical revision.

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

- a) Clarification on test application either to a complete SPD, to a “mode of protection”, or to a complete “SPD assembly”

- 129 b) Additional measurement of voltage protection level on “combined modes of protection”
130 between live conductors and PE
- 131 c) Additional duty test for T1 SPD and T2 SPD with follow current to check for increased
132 follow current at lower impulse current amplitude
- 133 d) Modified and amended short circuit current test requirements to better cover up to date
134 internal SPD disconnecter technologies
- 135 e) Improved dielectric test requirements for the SPD’s main circuits and added dielectric test
136 requirements for “electrically separated circuits”
- 137 f) Additional clearance requirements for “electrically separated circuits”

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

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

139

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

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

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

- 146 • reconfirmed,
- 147 • withdrawn,
- 148 • replaced by a revised edition, or
- 149 • amended.

150 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations
151 may need a transitional period following publication of a new, amended or revised IEC publication in which to make
152 products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

153 It is the recommendation of the committee that the content of this publication be adopted for national
154 implementation not earlier than 12 months and not later than 36 months from the date of publication.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

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INTRODUCTION

158 It has been assumed in the drafting of this International Standard that the execution of its
159 provisions is entrusted to appropriately qualified and experienced persons.

160 This standard recognizes the internationally accepted level of protection against hazards such
161 as electrical, mechanical, thermal, fire and radiation of SPDs when operated as in normal use
162 taking into account the manufacturer's instructions. It also covers abnormal situations that can
163 be expected in practice.

164 This standard takes into account the requirements of IEC 60364 as far as possible so that
165 there is compatibility with the wiring rules when the SPD is connected to the supply mains.
166 However, national wiring rules may differ.

167 If the intended applications of an SPD are covered by different parts of the IEC 61643-X1 (X =
168 1,2,3,4, etc.) series, all relevant parts shall be applied, as far as is reasonable.

169 NOTE 1: Throughout this publication, when "part 01" is mentioned, it refers to IEC 61643-01, and when "part 11" is
170 mentioned, it refers to this standard.

171 This part of the IEC 61643 series addresses safety and performance tests for surge protective
172 devices (SPDs) for AC applications in conjunction with part 01.

173 This part 11 addresses T1 SPD, T2 SPD and T3 SPD according to part 01.

174 The requirements of this part 11 supplement, modify or replace certain of the general
175 requirements contained in part 01 and shall be read and applied together with the latest
176 edition of part 01, as indicated by the undated normative reference in the normative
177 references of this document.

178 Numbering of clauses follows the numbering of part 01, but, dependent on the application of
179 clauses from part 01, does not necessarily follow sequentially.

180 If a clause in part 01 is not explicitly called up or referred to in this part 11, then this clause
181 does not apply to SPDs covered by this part 11. Any instructions in this standard calling up
182 clauses from part 01 are written in *Italic type*.

183 NOTE 2: In other words, if e.g. clause 4 is called up in this document all subclauses of clause 4 of part 01 are
184 applied without modification. But, if e.g. some modifications are required on subclauses of clause 9 of part 01, then
185 the relevant second level subclauses of part 01 (e.g. 9.3, 9.5 etc.) are called up separately and it is indicated how
186 they are applied.

187 The numbering of additional subclauses to part 01 in this document starts with the number
188 100 in the last section of the subclause added (see e.g. 4.100)

189 IEC 61643-12 addresses the selection and application principles of SPDs.

190 A list of all parts of the IEC 61643 series can be found, under the general title *Low-voltage*
191 *surge protective devices*, on the IEC website.

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LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

Part 11: Surge protective devices connected to AC low-voltage power systems – Requirements and test methods

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201 **1 Scope**

202 This part of the IEC 61643 series is applicable to devices for surge protection against indirect
203 and direct effects of lightning or other transient overvoltages.

204 These devices are intended to be connected to 50/60 Hz AC power circuits and equipment
205 rated up to 1 000 V RMS. Performance and safety requirements, tests and ratings are
206 specified in this standard. These devices contain at least one nonlinear component and are
207 intended to limit surge voltages and divert surge currents.

208 The test requirements provided by this standard are based on the assumption that the SPD is
209 connected to an AC power circuit fed by a power source providing a linear voltage-current
210 characteristic. When the SPD is to be connected to a different kind of source or to a different
211 frequency, careful consideration is required. This mainly applies with regard to system and
212 fault conditions to be expected in such a system (e.g. expected short circuit current, TOV-
213 stresses).

214 This standard can apply for railway applications, when related product standards do not exist
215 for that area or for certain applications.

216 Based on a risk assessment it may not be necessary to apply all requirements of this
217 standard to SPDs designed for specific power applications only, e.g. circuits with a low power
218 capability, circuits supplied by nonlinear sources, circuits with protective separation from the
219 utility supply.

220 NOTE 1: More information on risk assessment is provided in IEC Guide 116.

221 NOTE 2: Other exclusions based on national regulations are possible.

222 **2 Normative references**

223 For the purposes of this document the normative references given in part 01 with the following
224 additions apply.

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

229 IEC 60038:2009 ed. 7.1, *IEC standard voltages*

230 IEC 60364-4-44:2018 ed. 2.2, *Low-voltage electrical installations – Part 4-44: Protection for safety*
231 *– Protection against voltage disturbances and electromagnetic disturbances*

232 IEC 60947-1:2020, *Low-voltage switchgear and controlgear - Part 1: General rules*

233 IEC 61643-01, *Low-voltage surge protective devices – Part 01: General requirements and test*
234 *methods*

235 **3 Terms, definitions and abbreviated terms**

236 *Clause 3 from part 01 applies.*

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

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

241 4 Classification

242 *Clause 4 from part 01 applies with the following additions:*

243 4.13 End of life mode of the SPD-assembly

244 *Clause 4.13 from part 01 applies with the following additions:*

245 For SPDs for AC power circuits fed by a power source providing a linear voltage-current
246 characteristic, only the open circuit mode according 4.13.1 of part 01 is applicable.

247 NOTE: A short circuiting SPD, when used with its required SPD disconnectors (SPD-assembly), fulfils the
248 conditions to be classified open circuit mode (OCM).

249 4.100 Power system

250 4.100.1 AC between 47 Hz and 63 Hz

251 4.100.2 AC other than the range of 47 Hz to 63 Hz

252 This may require additional and/or modified test procedures.

253 5 Void

254 6 Marking and other product information

255 *Clause 6 from part 01 applies with the following additions.*

256 6.2 List of items

257 *Clause 6.2 from part 01 applies with the following additions:*

258 The following information from the list of items in clause 6.2 of part 01 and any additional
259 items specified shall be provided as required below.

260 6.2.100 Markings which are required on the body, or permanently attached to the body, 261 of the SPD:

262 6.2.100.1 Markings which shall be visible after installation:

263 Items a1) to a3) from 6.2 of part 01 shall be visible after installation.

264 For portable SPDs and for pluggable SPDs it is sufficient that above markings are
265 visible in the unplugged condition. This does not apply to the minimum marking
266 requirements according 6.1 of part 01.

267 6.2.100.2 Markings which are not required to be visible after installation:

268 Items a4) to a8) from 6.2 of part 01 shall be visible on the SPD, but are not
269 required to be visible after installation.

270 6.2.101 Information to be provided by the manufacturer:

271 Items a1) to a40) from 6.2 of part 01 shall be provided, if applicable.

272 6.2.102 Information which shall be provided by the manufacturer for type testing, as 273 applicable:

274 Items a41) to a43) from 6.2 of part 01 and in addition:

275 a100) prospective short-circuit current for conditioning according 9.3.6.4.101
276 shall be provided.

277 7 Service conditions

278 *Clause 7 from part 01 applies with the following addition:*

279 7.100 Frequency

280 The standard frequency range is from 47 Hz to 63 Hz AC.

281 Other frequencies may require additional and/or modified test procedures.

282 8 Requirements

283 *Clause 8 from part 01 applies with the following additions and exemptions:*

284 8.3 Electrical requirements

285 *Clause 8.3 from part 01 applies with the following additions:*

286 8.3.9 Behaviour under temporary overvoltages

287 *Clause 8.3.9 from part 01 applies with the following additions:*

288 SPD shall either withstand the overvoltages caused by faults or disturbances in the high or
289 low voltage system, or fail in a manner not creating a hazard.

290 NOTE: This covers the requirements for fault protection from clause 534.4.6 of IEC 60364-5-53.

291 8.3.9.100 TOVs caused by faults or disturbances in the low voltage system

292 Compliance is checked by the test in accordance with 9.3.9.100.

293 8.3.9.101 TOVs caused by faults in the high (medium) voltage system

294 Compliance is checked by the test in accordance with 9.3.9.101.

295 SPDs, for which the manufacturer declares in his installation instructions that they may be
296 installed in TT-systems between neutral and PE upstream of the main RCD, shall pass this
297 test in withstand mode according 9.3.9.101.2, b).

298 8.5 Environmental and material requirements

299 *Clause 8.5 from part 01 applies with the following exemption:*

300 8.5.5 Ageing behaviour under damp heat

301 *This clause 8.5.5 from part 01 does not apply.*

302 9 Tests

303 *Clause 9 from part 01 applies with the following additions:*

304 9.1 General

305 *Clause 9.1 from part 01 applies with the following additions:*

306 9.1.1 General testing procedures

307 *Clause 9.1.1 from part 01 applies with the following additions:*

308 The test voltage U_{test} shall be selected from Annex B based on the information given by the
309 manufacturer according to 6.2.101 and according to 6.2, a10, a11), a20) and a21) of part 01.

310 The test frequency shall be 50Hz or 60 Hz ± 3 Hz unless otherwise specified.

311 For SPDs with a designated N terminal/connection, which may be applied in systems without
312 distributed neutral according to the manufacturer's instructions, separate testing is required
313 for the L-PE mode of protection with the neutral being unconnected.

314 All tests and the respective use of the tissue paper and/or the metallic screen as required for
315 certain tests are shown in Table 1.