



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 61643-21:2024**  
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**Niskonapetostne naprave za zaščito pred prenapetostnimi udari - 21. del: Naprave, priključene na telekomunikacijska in signalna omrežja - Zahteve in preskusne metode**

Low voltage surge protective devices - Part 21: Surge protective devices connected to telecommunications and signalling networks - Requirements and testing methods

Überspannungsschutzgeräte für Niederspannung - Teil 21: Überspannungsschutzgeräte für den Einsatz in Telekommunikations- und signalverarbeitenden Netzwerken - Leistungsanforderungen und Prüfverfahren

Parafoudres basse tension - Partie 21: Parafoudres connectés aux réseaux de télécommunications - Prescriptions de fonctionnement et méthodes d'essais

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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                   |

**oSIST prEN IEC 61643-21:2024**

**en**





# 37A/414/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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|   |   |
|---|---|
| IEC SC 37A : LOW-VOLTAGE SURGE PROTECTIVE DEVICES   |   |
| SECRETARIAT:<br>United States of America  | SECRETARY:<br>Mr David Richmond   |
| OF INTEREST TO THE FOLLOWING COMMITTEES:<br>TC 37   | PROPOSED HORIZONTAL STANDARD:<br><input type="checkbox"/><br>Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary. |
| FUNCTIONS CONCERNED:<br><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<br><b>Attention IEC-CENELEC parallel voting</b><br>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.<br>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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TITLE:

**Low voltage surge protective devices - Part 21: Surge protective devices connected to telecommunications and signalling networks - Requirements and testing methods**

PROPOSED STABILITY DATE: 2029

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231 INTERNATIONAL ELECTROTECHNICAL COMMISSION

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## LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

235

### Part 21: Surge protective devices connected to telecommunications and signalling networks – Requirements and test methods

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## FOREWORD

243 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising  
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275 International Standard IEC 61643-21 has been prepared by subcommittee 37A: Low-voltage  
276 surge protective devices, of IEC technical committee 37: Surge arresters.

277 This second edition cancels and replaces the first edition including the amendments published  
278 in 2000, 2008 and 2012. This edition constitutes a technical revision.

279

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

- 282 a) New structure of IEC 61643-21 based on IEC 61643-01 Ed.1  
283 b) Several safety requirements based on IEC 61643-01 Ed.1 has been added.

284

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

|            |                  |
|------------|------------------|
| FDIS       | Report on voting |
| XX/XX/FDIS | XX/XX/RVD        |

286

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

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

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

- 293 • reconfirmed,
- 294 • withdrawn,
- 295 • replaced by a revised edition, or
- 296 • amended.

297

298 The National Committees are requested to note that for this document the stability date is

299 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED  
300 AT THE PUBLICATION STAGE.

301

302

## INTRODUCTION

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

305 This standard recognizes the internationally accepted level of protection against hazards such  
306 as electrical, mechanical, thermal, fire and radiation of SPDs when operated as in normal use  
307 taking into account the manufacturer's instructions.

308 The purpose of this International Standard is to identify the requirements for Surge Protective  
309 Devices (SPDs) used in protecting telecommunication and signalling systems, for example, low-  
310 voltage data, voice, and alarm circuits.

311 If the intended applications of an SPD are covered by different parts of the IEC 61643-X1 (X =  
312 1,2,3,4, etc.) series, all relevant parts shall be applied, as far as is reasonable.

313 NOTE 1: Throughout this publication, when "part 01" is mentioned, it refers to IEC 61643-01:2024.

314 This part of the IEC 61643 series addresses safety and performance tests for surge protective  
315 devices (SPDs) for telecommunication and signalling systems in conjunction with part 01.

316 The SPDs addressed in this International Standard contain surge protective components only,  
317 or a combination of surge protective and current-limiting components. Protection devices  
318 containing current-limiting components only are not within the coverage of this standard.

319 SPDs contain one or more protective components. All SPDs are tested on a "black box" basis,  
320 i.e., the number of connections of the SPD determine the testing procedure, not the number of  
321 components in the SPD. The SPD configurations are described in 4.100.

322 This standard covers a wide range of testing conditions and requirements; the use of some of  
323 these is at the discretion of the user. How the requirements of this standard relate to the  
324 different types of SPD is described in Table 1.

325 The requirements of this part of IEC 61643 supplement, modify or replace certain of the general  
326 requirements contained in part 01 and are to be read and applied together with the latest edition  
327 of IEC 61643-01, as indicated by the undated normative reference in the normative references  
328 of this document.

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

331 If a clause in part 01 is not explicitly called up or referred to in this part 21, then this clause  
332 does not apply to SPDs covered by this part 21. Any instructions in this standard calling up  
333 clauses from part 01 are written in *Italic type*.

334 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 applied  
335 without modification. But, if e.g. some modifications are required on subclauses of clause 9 of part 01, then the  
336 relevant second level subclauses of part 01 (e.g. 9.3, 9.5 etc.) are called up separately and it is indicated how they  
337 are applied.

338 The numbering of additional subclauses to part 01 in this document starts with the number 100  
339 in the last section of the subclauses added (e.g. 4.100 or 6.2.100).

340 Selection and application principles are covered in IEC 61643-22.

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

343 LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

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**Part 21: Surge protective devices connected  
to telecommunications  
and signalling networks –  
Requirements and testing methods**

350 **1 Scope**

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

353 These devices are intended to be connected to telecommunications and signalling networks,  
354 and equipment rated up to 1 000 V RMS and 1 500 V DC.

355 These telecommunications and signalling networks may also provide power on the same line,  
356 e.g Power over Ethernet (PoE).

357 Performance and safety requirements, tests and ratings are specified in this standard. These  
358 devices contain at least one voltage-limiting component (clamping or switching) and are  
359 intended to limit surge voltages and divert surge currents.

360 **2 Normative references**

361 For the purposes of this document normative reference given in part 01 apply.

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

366 IEC 61643-01:2023, *Low-voltage surge protective devices – Part 01: General requirements and*  
367 *test methods*

368 **3 Terms, definitions and abbreviated terms**

369 *Clause 3 from part 01 applies with the following additions:*

370 **3.1 Terms and definitions**

371 *Clause 3.1 from part 01 applies with the following additions:*

372 **3.1.25**

373 **means for short-circuiting the SPD (SC-means)**

374 *Clause 3.1.25 from part 01 applies with the following replacement:*

375 Replace short-circuit current rating  $I_{SCCR}$  by  $n$  times  $I_L$

376 **3.1.28**

377 **mode of protection**

378 *Clause 3.1.28 from part 01 applies with the following addition:*

379 Add in Note 2 the examples “line to earth and shield to earth”.

- 380 **3.1.100**  
381 **AC durability**  
382 characteristic of an SPD which allows it to conduct alternating current of a specific magnitude  
383 and duration for a specified number of times
- 384 **3.1.101**  
385 **blind spot**  
386 situation where voltages above the maximum continuous operating voltage  $U_C$  causes  
387 incomplete operation of the SPD
- 388 Note 1 to entry: Incomplete operation of the SPD means not all current paths in a multi-stage SPD have operated  
389 during the impulse test. This results in overstressing of components in the SPD.
- 390 **3.1.102**  
391 **current limiting**  
392 action of an SPD, containing at least one non-linear current-limiting component, that causes  
393 currents exceeding a predetermined value to be restricted
- 394 **3.1.103**  
395 **current reset time**  
396 time required for a self-resetting current limiting component to revert to its normal or quiescent  
397 state
- 398 **3.1.104**  
399 **current response time**  
400 time required for a current-limiting component to operate at a specified current and a specified  
401 temperature
- 402 **3.1.105**  
403 **impulse durability**  
404 characteristic of an SPD which allows it to conduct impulse current of a specified waveform and  
405 peak value for a specified number of times
- 406 **3.1.106**  
407 **insertion loss**  
408 loss resulting from the insertion of an SPD into a transmission system
- 409 Note 1 to entry: It is the ratio of the power delivered to that part of the system following the SPD, before insertion of  
410 the SPD, to the power delivered to that same part after insertion of the SPD. The insertion loss is generally expressed  
411 in decibels.  
412 [IEV 726-06-07, modified]
- 413 **3.1.107**  
414 **insulation resistance based on the continuous current**  
415 resistance between designated connections of an SPD when  $U_C$  is applied to those connections
- 416 **3.1.108**  
417 **longitudinal balance (analogue voice frequency circuits)**  
418 electrical symmetry of the two wires comprising a pair with respect to ground
- 419 **3.1.109**  
420 **longitudinal balance (communication and control cables)**  
421 ratio of the disturbing common mode (longitudinal) RMS voltage ( $V_s$ ) to ground and the resulting  
422 differential mode (metallic) RMS voltage ( $V_m$ ) of the SPD, expressed in decibels (dB)
- 423 Note 1 to entry: The longitudinal balance in dB is given by the formula:  $20 \log_{10} V_s/V_m$  where  $V_s$  and  $V_m$  are  
424 measured at the same frequency.