



SLOVENSKI STANDARD
SIST EN 60269-1:2007/oprA3:2022
01-junij-2022

Nizkonapetostne varovalke - 1. del: Splošne zahteve - Dopolnilo A3

Amendment 3 - Low-voltage fuses - Part 1: General requirements

Niederspannungssicherungen - Teil 1: Allgemeine Anforderungen

Fusibles basse tension - Partie 1: Exigences générales

Ta slovenski standard je istoveten z: **EN 60269-1:2007/prA3:2022**

ICS:

29.120.50

Varovalke in druga
nadtokovna zaščita

Fuses and other overcurrent
protection devices

SIST EN 60269-1:2007/oprA3:2022

en,fr,de

**iTeh STANDARD
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SIST EN 60269-1:2007/oprA3:2022

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32B/715/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 60269-1/AMD3 ED4	
DATE OF CIRCULATION: 2022-03-11	CLOSING DATE FOR VOTING: 2022-06-03
SUPERSEDES DOCUMENTS: 32B/702/CD, 32B/708A/CC	

IEC SC 32B : LOW-VOLTAGE FUSES	
SECRETARIAT: Germany	SECRETARY: Mr Michael Altenhuber
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 type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
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TITLE:

Amendment 3 - Low-voltage fuses - Part 1: General requirements

PROPOSED STABILITY DATE: 2025

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1

2 All changes to the present edition are marked in red for easier reading

3

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE FUSES –

Part 1: General requirements

FOREWORD

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242 **This Consolidated version of IEC 60269-1 bears the edition number 4.2. It consists of the**
 243 **fourth edition (2006-11) [documents 32B/483/FDIS and 32B/490/RVD], its amendment 1**
 244 **(2009-04) [documents 32B/534/FDIS and 32B/540/RVD] and its amendment 2 (2014-06)**
 245 **[documents 32B/626/FDIS and 32B/628/RVD]. The technical content is identical to the**
 246 **base edition and its amendments.**

247 **This Final version does not show where the technical content is modified by amendments**
 248 **1 and 2. A separate Redline version with all changes highlighted is available in this**
 249 **publication.**

250 **This publication has been prepared for user convenience.**

252 International Standard IEC 60269-1 has been prepared by subcommittee 32B: Low-voltage
253 fuses, of IEC technical committee 32: Fuses.

254 IEC 60269 consists of the following parts, under the general title *Low-voltage fuses*:

255 Part 1: General requirements

256 Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for
257 industrial application) – Examples of standardized systems of fuses A to I

258 Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for
259 household or similar application) – Examples of standardized systems of fuses A to F

260 Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices

261 Part 5: Guidance for the application of low-voltage fuses

262 Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic
263 energy systems

264 **Part 7: Battery Fuses**

265 For reasons of convenience, when a part of this publication has come from other publications,
266 a remark to this effect has been inserted in the text.

267 The committee has decided that the contents of the base publication and its amendments will
268 remain unchanged until the stability date indicated on the IEC web site under
269 "http://webstore.iec.ch" in the data related to the specific publication. At this date, the
270 publication will be

- 271 • reconfirmed,
- 272 • withdrawn,
- 273 • replaced by a revised edition, or
- 274 • amended.

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276

INTRODUCTION

277

278

~~A reorganization of the different parts of the IEC 60269 series has been carried out, in order to simplify its use, especially by the laboratories which test the fuses.~~

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~~IEC 60269-1, IEC 60269-2, IEC 60269-3 and IEC 60269-3-1 have been integrated into either the new part 1 or the new parts 2 or 3, according to the subjects considered, so that the clauses which deal exclusively with “fuses for authorized persons” are separated from the clauses dealing with “fuses for unauthorized persons”.~~

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284

~~As far as IEC 60269-4 and IEC 60269-4-1 are concerned, they have been integrated into the new part 4 which deals with the fuse links used for semiconductor protection.~~

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LOW-VOLTAGE FUSES –

Part 1: General requirements

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293 1 General

294 1.1 Scope and object

295 This part of IEC 60269 is applicable to fuses incorporating enclosed current-limiting fuse-links
296 with rated breaking capacities of not less than 6 kA, intended for protecting power-frequency
297 AC circuits of nominal voltages not exceeding 1 000 V or DC circuits of nominal voltages not
298 exceeding 1 500 V.

299 Subsequent parts of this standard, referred to herein, cover supplementary requirements for
300 such fuses intended for specific conditions of use or applications.

301 Fuse-links intended to be included in fuse-switch combinations according to IEC 60947-3
302 should also comply with the following requirements.

303 NOTE 1 **As far as not stated in subsequent parts** for "a" fuse-links details of performance (see 2.2.4) on DC
304 circuits should be subject to agreement between user and manufacturer.

305 NOTE 2 Modifications of, and supplements to, this standard required for certain types of fuses for particular
306 applications – for example, certain fuses for rolling stock, or fuses for high-frequency circuits – will be covered, if
307 necessary, by separate standards.

308 NOTE 3 This standard does not apply to miniature fuses, these being covered by IEC 60127.

309 The object of this standard is to establish the characteristics of fuses or parts of fuses (fuse-
310 base, fuse-carrier, fuse-link) in such a way that they can be replaced by other fuses or parts of
311 fuses having the same characteristics provided that they are interchangeable as far as their
312 dimensions are concerned. For this purpose, this standard refers in particular to

- 313 – the following characteristics of fuses:
314 ▪ ~~their~~ rated values;
315 ▪ ~~their~~ insulation;
316 ▪ ~~their~~ temperature rise in normal service;
317 ▪ ~~their~~ power dissipation and acceptable power dissipation;
318 ▪ ~~their~~ time/current characteristics;
319 ▪ ~~their~~ breaking capacity;
320 ▪ ~~their~~ cut-off current characteristics and their I^2t characteristics.
321 – type test for verification of the characteristics of fuses;
322 – the marking of fuses.

323 1.2 Normative references

324 The following referenced documents are indispensable for the application of this document. For
325 dated references, only the edition cited applies. For undated references, the latest edition of
326 the referenced document (including any amendments) applies.

327 IEC 60038:1983, *IEC standard voltages*

328 IEC 60050(441):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441:*
329 *Switchgear, controlgear and fuses*
330 Amendment 1 (2000)

331 IEC 60228:2004, *Conductors of insulated cables*

332 IEC 60269-2, *Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by*
 333 *authorized persons (fuses mainly for industrial application) – Examples of standardized systems*
 334 *of fuses A to I)*

335 IEC 60269-3, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by*
 336 *unskilled persons (fuses mainly for household or similar application) – Examples of*
 337 *standardized systems of fuses A to F*

338 IEC 60269-4, *Low-voltage fuses – Part 4: Supplementary requirements for fuse-links for the*
 339 *protection of semiconductor devices*

340 IEC 60269-5, *Low-voltage fuses – Part 5: Guidance for the application of low-voltage fuses*

341 IEC 60269-6, *Low-voltage fuses – Part 6: Supplementary requirements for fuse-links for the*
 342 *protection of solar photovoltaic energy systems*

343 **IEC 60269-7, *Low-voltage fuses – Part 7: Supplementary requirements for fuse-links for***
 344 ***the protection of battery systems***

345 IEC 60364-3:1993, *Electrical installations of buildings – Part 3: Assessment of general*
 346 *characteristics*

347 IEC 60364-5-52:2001, *Electrical installations of buildings – Part 5-52: Selection and erection of*
 348 *electrical equipment – Wiring system*

349 IEC 60529:1989, *Degrees of protection provided by enclosures (Code IP)*

350 IEC 60584-1:1995, *Thermocouples – Part 1: Reference tables*

351 IEC 60617, *Graphical symbols for diagrams*

352 IEC 60664-1:2002, *Insulation coordination for equipment within low-voltage systems – Part 1:*
 353 *Principles, requirements and tests*

354 IEC 60695-2-10, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-*
 355 *wire apparatus and common test procedure*

356 IEC 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods –*
 357 *Glow-wire flammability test method for end-products*

358 IEC 60695-2-12:2000, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods –*
 359 *Glow-wire flammability index (GWFI) test method for materials*

360 IEC 60695-2-13:2000, *Fire hazard testing – Part 2-13: Glowing/hot-wire based test methods –*
 361 *Glow-wire ignition temperature (GWIT) test method for materials*

362 ISO 3:1973, *Preferred numbers – Series of preferred numbers*

363 ISO 478:1974, *Paper – Untrimmed stock sizes for the ISO-A series – ISO primary range*

364 ISO 593:1974, *Paper – Untrimmed stock size for the ISO-A series – ISO supplementary range*

365 ISO 4046:1978, *Paper, board, pulp and related terms – Vocabulary – Bilingual edition*

366 **2 Terms and definitions**

367 NOTE For general definitions concerning fuses, see also IEC 60050-441.

368 For the purposes of this document, the following terms and definitions apply.

369 **2.1 Fuses and their component parts**

370 **2.1.1**

371 **fuse**

372 device that by the fusing of one or more of its specially designed and proportioned components
373 opens the circuit in which it is inserted by breaking the current when this exceeds a given value
374 for a sufficient time. The fuse comprises all the parts that form the complete device.

375 [IEV 441-18-01]

376 **2.1.2**

377 **fuse-holder**

378 combination of the fuse-base with its fuse-carrier

379 NOTE Where, in this standard, the term "fuse-holder" is used, it covers fuse-bases and/or fuse-carriers, if no clearer
380 distinction is necessary.

381 [IEV 441-18-14]

382 **2.1.2.1**

383 **fuse-base (fuse-mount)**

384 fixed part of a fuse provided with contacts and terminals

385 [IEV 441-18-02]

386 NOTE Where applicable, covers are considered as part of the fuse-base.

387 **2.1.2.2**

388 **fuse-carrier**

389 movable part of a fuse designed to carry a fuse-link

390 [IEV 441-18-13]

391 **2.1.3**

392 **fuse-link**

393 part of a fuse including the fuse-element(s), intended to be replaced after the fuse has operated

394 [IEV 441-18-09]

395 **2.1.4**

396 **fuse-contact**

397 two or more conductive parts designed to ensure circuit continuity between a fuse-link and the
398 corresponding fuse-holder

399 **2.1.5**

400 **fuse-element**

401 part of the fuse-link designed to melt under the action of current exceeding some definite value
402 for a definite period of time

403 [IEV 441-18-08]

404 NOTE The fuse-link may comprise several fuse-elements in parallel.

405 **2.1.6**

406 **indicating device (indicator)**

407 part of a fuse provided to indicate whether the fuse has operated

408 [IEV 441-18-17]

409 **2.1.7**

410 **striker**

411 mechanical device forming part of a fuse-link which, when the fuse operates, releases the
412 energy required to cause operation of other apparatus or indicators or to provide interlocking

413 [IEV 441-18-18]

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- 414 **2.1.8**
 415 **terminal**
 416 conductive part of a fuse provided for electric connection to external circuits
- 417 NOTE Terminals may be distinguished according to the kind of circuits for which they are intended (for example,
 418 main terminal, earth terminal, etc.) and also according to their design (for example, screw terminal, plug terminal,
 419 etc.).
- 420 **2.1.9**
 421 **dummy fuse-link**
 422 test fuse-link with defined power dissipation and dimensions
- 423 **2.1.10**
 424 **test rig**
 425 defined test fuse-base
- 426 **2.1.11**
 427 **gauge-piece**
 428 additional part of a fuse-base intended to achieve a degree of non-interchangeability
- 429 **2.1.12**
 430 **linked fuse-carrier**
 431 a fuse-carrier which is mechanically linked to the fuse-base and gives a defined insertion and
 432 withdrawal movement to the fuse-link
- 433 [This definition was definition 2.1.12 in IEC 60269-2-1, Section I, which has been withdrawn.]
- 434 **2.2 General terms**
- 435 **2.2.1**
 436 **enclosed fuse-link**
 437 fuse-link in which the fuse-element(s) is (are) totally enclosed, so that during operation within
 438 its rating it cannot produce any harmful external effects, for example, due to development of an
 439 arc, the release of gas or the ejection of flame or metallic particles
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- 440 [IEV 441-18-12] [https://standards.iteh.ai/catalog/standards/sist/2eccd347-
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- 441 **2.2.2**
 442 **current-limiting fuse-link**
 443 fuse-link that during and by its operation in a specified current range, limits the current to a
 444 substantially lower value than the peak value of the prospective current
- 445 [IEV 441-18-10]
- 446 **2.2.3**
 447 **"g" fuse-link**
 448 (full-range breaking-capacity fuse-link, formerly general purpose fuse-link)
 449 current-limiting fuse-link capable of breaking under specified conditions all currents, which
 450 cause melting of the fuse-element up to its rated breaking capacity
- 451 **2.2.4**
 452 **"a" fuse-link**
 453 (partial-range breaking-capacity fuse-link, formerly back-up fuse-link)
 454 current-limiting fuse-link capable of breaking under specified conditions all currents between
 455 the lowest current indicated on its operating time-current characteristic (k_2I_n in Figure 2) and
 456 its rated breaking capacity
- 457 NOTE "a" fuse-links are generally used to provide short-circuit protection. Where protection is required against
 458 over-currents less than k_2I_n in Figure 2, they are used in conjunction with another suitable switching device designed
 459 to interrupt such small overcurrents.