

Miniature fuses

Part 3. Specification for sub-miniature fuse-links

This European Standard EN 60127-3 : 1991 has the status of a British Standard

Coupe-circuit miniatures
Troisième partie: Eléments de remplacement
subminiatures

Geräteschutzsicherungen
Teil 3: Kleinstsicherungseinsätze

Cooperating organizations

The European Committee for Electrotechnical Standardization (CENELEC), under whose supervision this European Standard was prepared, comprises the National Committees of the following countries.

Austria	Italy
Belgium	Luxemburg
Denmark	Netherlands
Finland	Norway
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Germany	Spain
Greece	Sweden
Iceland	Switzerland
Ireland	United Kingdom

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National foreword

This British Standard has been prepared under the direction of the Power Electrical Engineering Standards Policy Committee and is the English language version of EN 60127-3, 'Miniature fuses. Part 3 : Sub-miniature fuse-links' which endorses IEC 127-3 : 1988 'Miniature fuses. Part 3 : Sub-miniature fuse-links' published by the International Electrotechnical Commission (IEC).

This British Standard is one of a series. Together the standards supersede BS 4265 which is withdrawn. The new standards are as follows.

BS EN 60127-1	Definitions for miniature fuses and general requirements for miniature fuse-links
BS EN 60127-2	Specification for cartridge fuse-links
BS EN 60127-3	Specification for sub-miniature fuse-links
BS EN 60127-5	Guide for the quality assessment of miniature fuse-links

It is anticipated that when IEC 127-4 and IEC 127-6 are published they will be approved by CENELEC as EN 60127-4 and EN 60127-6 respectively. IEC 127-4 TTD : 1989 is identical with DD 183 : 1989 'Specification for universal modular fuses'.

The foreword and preface of IEC 127-3 : 1988 which do not form part of the text of EN 60127-1 have been quoted in national appendix NA.

Annexes designated 'normative' are part of the body of the standard. Annexes designated 'informative' are given for information only. National appendices are designated 'informative'.

For the purposes of this British Standard, any references to IEC page numbers in the text should be ignored.

Cross-references. Details of international standards quoted in this British Standard for which there is an identical or technically equivalent British Standard are given in national appendix NC.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Descriptors: Miniature fuse, sub-miniature fuse, specification, rated characteristic, dimension, test

English version

Miniature fuses Part 3 : Sub-miniature fuse-links

(IEC 127-3 : 1988)

Coupe-circuit miniatures
Troisième partie. Eléments de remplacement
subminiatures
(CEI 127-3 : 1988)

Geräteschutzsicherungen
Teil 3: Kleinstsicherungseinsätze
(IEC 127-3 : 1988)

This European Standard was approved by CENELEC on 1 February 1991. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 127-3 : 1988 could be accepted without textual changes, has shown that no CENELEC common modifications were necessary for the acceptance as European Standard. The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 60127-3 on 1 February 1991.

The following dates were fixed:

- latest date of (doa) 1991-09-01
announcement of the EN
at national level

- latest date of (dop) 1992-03-01
publication of an
identical national
standard

- latest date of (dow) 1992-03-01
withdrawal of conflicting
national standards

Annexes designated 'normative' are part of the body of the standard. In this standard, annex ZA is normative.

For products which have complied with the HD 109.3 S1 : 1989 before 1992-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1997-03-01.

Endorsement notice

The text of the International Standard IEC 127-3 : 1988 was approved by CENELEC as a European Standard without any modification.

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MINIATURE FUSES

Part 3: Sub-miniature fuse-links

INTRODUCTION

The users of miniature fuses express the wish that all standards, recommendations and other documents relating to miniature fuses should have the same publication number in order to facilitate reference to fuses in other specifications, e.g. equipment specifications.

Furthermore a single publication number and subdivision into parts would facilitate the establishment of new standards, because paragraphs containing general requirements need not be repeated.

The new IEC Publication 127 series is intended to be subdivided as follows:

- Publications Nos 127: Miniature fuses (general title)
- 127-1: Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links.
 - 127-2: Part 2: Cartridge fuse-links.
 - 127-3: Part 3: Subminiature fuse-links.
 - 127-4: Part 4: Universal modular fuse-links.
 - 127-5: Part 5: Guidelines for quality assessment of miniature fuse-links.
 - 127-6: Part 6: Fuse-holders (until now IEC 257).
 - 127-7: (free for further documents).
 - 127-8: (free for further documents).
 - 127-9: Part 9: Test-holders and test-circuits.
 - 127-10: Part 10: User guide.

The third part of this standard covers additional requirements, test equipment and Standard Sheets.

SECTION ONE — ADDITIONAL REQUIREMENTS AND TEST EQUIPMENT

1. Scope

This standard relates to special requirements applicable to sub-miniature fuse-links adapted to printed circuits and used for the protection of electric appliances, electronic equipment and component parts thereof, normally intended to be used indoors.

It does not apply to sub-miniature fuse-links for appliances intended to be used under special conditions, such as in a corrosive or explosive atmosphere.

Note. — Electrical and electronic circuit designers and printed circuit board manufacturers are advised to allow a 10 mm cube space for all sub-miniature fuse-links.

This standard applies in addition to the requirements of Part 1.

2. Object

The object of this standard is:

To define special and additional test methods for sub-miniature fuse-links applying in addition to the requirements of Part 1.

3. Definitions (see Part 1)

4. **General requirements** (see Part 1)

5. **Standard ratings** (see Part 1)

6. **Marking**

Additionally to the requirements of Clause 6 in Part 1 the following criterion is to be observed:

6.4 The values for “d” and “s” are given in the relevant Standard Sheet.

7. **General notes on tests**

Additionally to the requirements of Clause 7 in Part 1 the following criteria are to be observed:

7.2.1 The number of sub-miniature fuse-links required in the case of sub-miniature fuse-links in accordance with Standard Sheets 1 and 2 is 66, of which 12 are kept as spares in case some of the tests have to be repeated. The number of sub-miniature fuse-links required in the case of sub-miniature fuse-links in accordance with Standard Sheets 3 and 4 is 51, of which 12 are kept as spares in case some of the tests have to be repeated.

Additionally to the test mentioned in Sub-clause 7.2.1 of Part 1, sub-miniature fuse-links shall be taken and shall be tested or inspected in accordance with the following sub-clause:

5. Sub-miniature fuse-link terminations (Sub-clause 8.3)

7.3 *Fuse-bases for testing*

For tests that require a printed wiring board for mounting and connection of the sub-miniature fuse-link, a standard test board as shown in Figure 1, page 18, shall be used. This standard printed wiring board shall be mounted on the standard test base of Figure 2, page 19. The base material for the board shall be phenolic cellulose paper, copperclad, laminated sheet.

The nominal sheet thickness shall be 1.6 mm.

The nominal thickness of the copper layer shall be 0.035 mm.

Metal parts of the fuse-base shall be made of brass with copper content between 58% and 70%. Contact parts shall be silver-plated.

When two or more sub-miniature fuse-links are tested in series, the fuse-bases shall be located so that there will be a spacing of not less than 50 mm between any two sub-miniature fuse-links under test. The conductor connecting the fuse-bases together and connecting the fuse-bases to the ammeter and the source of supply shall be insulated copper wire. The length of each conductor shall be 250 mm and the diameter of the wire shall be approximately 0.64 mm.

Note. — Fuse-bases for testing having equivalent electrical and thermal properties and providing for quick insertion of sub-miniature fuse-links are under consideration.

7.4 Schedule for testing sub-miniature fuse-links according to Standard Sheets 1 and 2, Table 1, page 15, and according to Standard Sheets 3 and 4, Table 2, page 17.

8. **Dimensions and construction**

Additionally to the requirements of Clause 8 in Part 1 the following criteria are to be observed:

8.2 Construction

The sub-miniature fuse-link shall be resistant to heat according to Sub-clause 9.7 of Part 1 and to fire in accordance with IEC Publication 695.

Compliance is checked by inspection.

This standard is based on the assumption that the case of the sub-miniature fuse-link is made of glass, ceramic or similar non-combustible material. For other material, such as the optional insulating sleeve or epoxy coating or similar material shown on Standard Sheet 2, additional tests are under consideration.

8.3 Sub-miniature fuse-link terminations

The sub-miniature fuse-link terminations should be firmly attached so that it is not possible to remove them without damaging the sub-miniature fuse-link.

The samples are pre-conditioned by immersion in water for 24 h at a temperature between 15 °C and 35 °C.

Terminations shall withstand the mechanical forces likely to be encountered during normal use. With the sub-miniature fuse-link held in a fixed position, each terminal in turn is subjected at ambient temperature to the forces laid down in this standard. These forces shall be exerted in the direction of the axis of the terminal and applied progressively without jerks. Test sample groups shall be equally divided among the specific termination tests stipulated in the relevant Standard Sheets.

Present test methods are to be performed in accordance with IEC Publication 68-2-21.

- For the tensile test (U_{a1}), the force applied shall be 10 N.
- For the thrust test (U_{a2}), the force applied shall be 2 N.
- For the bending test (U_b), if applicable, the force applied shall be 5 N and the number of bends shall be one.

At the conclusion of testing, the sub-miniature fuse-link terminations shall remain firmly attached and the voltage drop shall not exceed the maximum allowed in the relevant Standard Sheet.

8.4 Termination configuration

The sub-miniature fuse-link terminations shall be designed to permit easy installation on printed circuit wiring boards having a grid system of holes located on 2.54 mm centres, or into fuse-bases having a spacing between the terminations which is compatible with the 2.54 mm grid system.

Note. — Electrical and electronic circuit designers are advised to note that grid systems for holes located on 2.54 mm centres may result in spacings between conductive tracks, in some applications, which do not provide sufficient creepage or clearance for open-circuit conditions. In such circumstances, it may be necessary to modify the land area around the mounting hole to ensure an acceptable minimum distance between conductive tracks or select a sub-miniature fuse-link with longer terminations which can be formed to fit into hole spacings offering the necessary degree of protection.

More details are given in the User Guide (under consideration as Part 10).

9. Electrical requirements

Additionally to the requirements of Clause 9 in Part 1 the following criteria are to be observed:

9.1 Voltage drop

The use of a high impedance voltmeter is recommended for measuring the voltage drop. Voltage drop shall be measured at the points marked with U in Figure 1, page 18.