



# SLOVENSKI STANDARD

## SIST EN 60420:1995

01-december-1995

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### High voltage alternating current switch-fuse combinations (IEC 420:1990)

High-voltage alternating current switch-fuse combinations

Hochspannungs-Latschalter-Sicherungs-Kombination

Combinés interrupteurs-fusibles à haute tension pour courant alternatif

Ta slovenski standard je istoveten z: EN 60420:1993

[SIST EN 60420:1995](https://standards.iteh.ai/catalog/standards/sist/4ed68b1c-d595-4163-a778-99ec677a452e/sist-en-60420-1995)

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#### **ICS:**

|           |  |   |
|-----------|--|---|
| 29.130.10 | Visokonapetostne stikalne in krmilne naprave | High voltage switchgear and controlgear |
|-----------|--|---|

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EUROPEAN STANDARD

EN 60420

NORME EUROPEENNE

EUROPÄISCHE NORM

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Descriptors: High-voltage, switch fuse combinations

## ENGLISH VERSION

High-voltage alternating current switch-fuse  
combinations  
(IEC 420:1990)

Combinés interrupteurs-fusibles  
à haute tension pour courant  
alternatif  
(CEI 420:1990)

Hochspannungs-Lastschalter-  
Sicherungs-Kombination  
(IEC 420:1990)

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This European Standard was approved by CENELEC on 1993-07-06.  
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

Central Secretariat: rue de Stassart 35, B-1050 Brussels

### FOREWORD

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 420:1990 could be accepted without textual changes, has shown that no 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 60420 on 6 July 1993.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-04-01
- latest date of withdrawal of conflicting national standards (dow) 1994-04-01

For products which have complied with the relevant national standard before 1994-04-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1999-04-01.

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

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### ENDORSEMENT NOTICE

The text of the International Standard IEC 420:1990 was approved by CENELEC as a European Standard without any modification.

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## ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD  
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

NOTE : When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

| IEC<br>Publication | Date | Title   | EN/HD        | Date |
|--------------------|------|---|--------------|------|
| -----              | ---- | -----   | -----        | ---- |
| 50(151)            | 1978 | International Electrotechnical Vocabulary (IEV) - Chapter 151: Electrical and magnetic devices  | -            | -    |
| 50(441)            | 1984 | Chapter 441: Switchgear, controlgear and fuses  | -            | -    |
| 56 (mod)           | 1987 | High-voltage alternating current circuit-breakers   | HD 348 S4    | 1991 |
| 129                | 1984 | Alternating current disconnectors (isolators) and earthing switches   | HD 408 S2    | 1990 |
| 137                | 1984 | Bushings for alternating voltages above 1000 V  | -            | -    |
| 265-1              | 1983 | High-voltage switches - Part 1: High-voltage switches for rated voltages above 1 kV and less than 52 kV (+ corrigendum February 1990) | HD 355.1 S2* | 1991 |
| 282-1              | 1985 | High-voltage fuses - Part 1: Current-limiting fuses   | EN 60282-1   | 1993 |

\* HD 355.1 S2 includes A1:1984 to IEC 265-1

| IEC<br>Publication<br>----- | Date<br>---- | Title<br>-----   | EN/HD<br>----- | Date<br>---- |
|-----------------------------|--------------|--|----------------|--------------|
| 298 (mod)                   | 1981         | A.C. metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 72.5 kV   | HD 187 S4*     | 1989         |
| 466                         | 1987         | A.C. insulation-enclosed switchgear and controlgear for rated voltages above 1kV and up to and including 38 kV | -              | -            |
| 694                         | 1980         | Common clauses for high-voltage switchgear and controlgear standards   | HD 448 S2*     | 1989         |
| 787                         | 1983         | Application guide for the selection of fuse-links of high-voltage fuses for transformer circuit applications   | -              | -            |

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\* HD 187 S4 is superseded by HD 187 S5:1992, which is based on IEC 298:1990  
HD 448 S2 includes A1:1985 to IEC 694

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INTERNATIONALE  
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420

Deuxième édition  
Second edition  
1990-11

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Combinés interrupteurs-fusibles à haute tension  
pour courant alternatif

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High-voltage alternating current switch-fuse  
combinations

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Numéro de référence  
Reference number  
CEI/IEC 420: 1990

## Révision de la présente publication

Le contenu technique des publications de la CEI est constamment revu par la Commission afin d'assurer qu'il reflète bien l'état actuel de la technique.

Les renseignements relatifs à ce travail de révision, à l'établissement des éditions révisées et aux mises à jour peuvent être obtenus auprès des Comités nationaux de la CEI et en consultant les documents ci-dessous:

- Bulletin de la CEI
- Annuaire de la CEI
- Catalogue des publications de la CEI  
Publié annuellement

## Terminologie

En ce qui concerne la terminologie générale, le lecteur se reportera à la Publication 50 de la CEI: Vocabulaire Electrotechnique International (VEI), qui est établie sous forme de chapitres séparés traitant chacun d'un sujet défini, l'Index général étant publié séparément. Des détails complets sur le VEI peuvent être obtenus sur demande.

Les termes et définitions figurant dans la présente publication ont été soit repris du VEI, soit spécifiquement approuvés aux fins de cette publication.

## Symboles graphiques et littéraux

Pour les symboles graphiques, symboles littéraux et signes d'usage général approuvés par la CEI, le lecteur consultera:

- la Publication 27 de la CEI: Symboles littéraux à utiliser en électrotechnique;
- la Publication 617 de la CEI: Symboles graphiques pour schémas.

Les symboles et signes contenus dans la présente publication ont été soit repris des Publications 27 ou 617 de la CEI, soit spécifiquement approuvés aux fins de cette publication.

## Publications de la CEI établies par le même Comité d'Etudes

L'attention du lecteur est attirée sur le deuxième feuillet de la couverture, qui énumère les publications de la CEI préparées par le Comité d'Etudes qui a établi la présente publication.

## Revision of this publication

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology.

Information on the work of revision, the issue of revised editions and amendment sheets may be obtained from IEC National Committees and from the following IEC sources:

- IEC Bulletin
- IEC Yearbook
- Catalogue of IEC Publications  
Published yearly

## Terminology

For general terminology, readers are referred to IEC Publication 50: International Electrotechnical Vocabulary (IEV) which is issued in the form of separate chapters each dealing with a specific field, the General Index being published as a separate booklet. Full details of the IEV will be supplied on request.

The terms and definitions contained in the present publication have either been taken from the IEV or have been specifically approved for the purpose of this publication.

## Graphical and letter symbols

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to:

- IEC Publication 27: Letter symbols to be used in electrical technology;
- IEC Publication 617: Graphical symbols for diagrams.

The symbols and signs contained in the present publication have either been taken from IEC Publications 27 or 617, or have been specifically approved for the purpose of this publication.

## IEC publications prepared by the same Technical Committee

The attention of readers is drawn to the back cover, which lists IEC publications issued by the Technical Committee which has prepared the present publication.



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE ALTERNATING CURRENT  
SWITCH-FUSE COMBINATIONS

## FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

This standard has been prepared by Sub-Committee 17A: High-voltage switchgear and controlgear, of IEC Technical Committee No. 17: Switchgear and controlgear

This second edition of IEC Publication 420 replaces the first edition published in 1973 as well as Amendment No.1 (1975), Amendment No. 2 (1977) and Amendment No. 3 (1978).

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The text of this standard is based on the following documents:

| Six Months' Rule | Report on Voting |
|------------------|------------------|
| 17A(CO)209       | 17A(CO)212       |

Full information on the voting for the approval of this standard can be found in the Voting Report indicated in the above table.

## HIGH-VOLTAGE ALTERNATING CURRENT SWITCH-FUSE COMBINATIONS

### 1 General

#### 1.1 Scope

This standard applies to three-pole units for public and industrial distribution systems which are functional assemblies of switches including switch-disconnectors and current-limiting fuses and thus able to interrupt:

- any load current up to the rated breaking current of the switch;
- any over-current up to the rated short-circuit breaking current of the combination by which automatic interruption is initiated.

NOTE 1 - Besides by the fuse and its striker operation, automatic interruption may be caused by an over-current release and by self-protecting devices.

It does not apply to fuse-circuit-breakers, fuse-contactors, combinations for motor-circuits or to combinations incorporating single capacitor bank switches.

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NOTE - 2 In this standard, the word "combination" is used in the following sense: a combination in which the components constitute a functional assembly.

The fuses are incorporated in order to extend the short-circuit rating of the combination beyond that of the switch alone. They are fitted with strikers in order both to open automatically all three poles of the switch on the operation of a fuse and to achieve a correct operation at values of fault current below the minimum breaking current of the fuses. In addition to the fuse strikers, the combination may be fitted with either an over-current release or a shunt release.

NOTE 3 - In this standard the term "fuse" is used to designate either the fuse or the fuse-link where the general meaning of the text does not result in ambiguity.

This standard applies to combinations designed with rated voltages above 1 kV and below 52 kV for use on three-phase alternating current systems of either 50 Hz or 60 Hz.

The individual components of the combinations shall comply, in all relevant respects, with IEC 265-1, 282-1 and 787 quoted below.

NOTE 4 - Switches shall be in accordance with IEC 265-1 except for the short-time current and short-circuit making requirements where the current limiting effects of the fuses are taken into account.

NOTE 5 - Earthing switches forming an integral part of a combination are covered by IEC 129. If the earthing switch has a rated short-circuit making current, the making tests should be made in accordance with the requirements of IEC 265-1.

NOTE 6 - This standard also applies to switch-fuse combinations when included in ring main unit format.

## 1.2 Normative references

This standard refers to IEC 694 which is applicable unless otherwise specified in this standard. In order to simplify the indication of corresponding requirements, the same numbering of clauses and sub-clauses is used as in IEC 694. Amendments to these clauses and sub-clauses are given under the same references whilst additional sub-clauses are numbered from 101.

IEC Publications quoted in this standard:

IEC 50(151): (1978), *International Electrotechnical Vocabulary (IEV), Chapter 151: Electrical and magnetic devices.*

IEC 50(441): (1984), *Chapter 441: Switchgear, controlgear and fuses.*

IEC 56: (1987), *High-voltage alternating current circuit-breakers.*

IEC 129: (1984), *Alternating current disconnectors (isolators) and earthing switches.*

IEC 137: (1984), *Bushings for alternating voltages above 1 000 V.*

IEC 265-1: (1983), *High-voltage switches, Part 1: High-voltage switches for rated voltages above 1 kV and less than 52 kV.*

IEC 282-1: (1985), *High-voltage fuses, Part 1: Current-limiting fuses.*

IEC 298: (1981), *A.C. Metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 72.5 kV.*

IEC 466: (1987), *A.C. insulation-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 38 kV.*

IEC 694: (1980), *Common clauses for high-voltage switchgear and controlgear standards.*

IEC 787: (1983), *Application guide for the selection of fuse-links of high-voltage fuses for transformer circuit applications.*

## 2 Normal and special service conditions

IEC 694 applies.

## 3 Definitions

For the purpose of this standard, the following definitions shall apply.

### 3.1 Devices and general terms

#### 3.1.1 Switch-fuse combinations (includes fuse-switch combinations)

A combination of a three-pole switch with three fuses provided with strikers, the operation of any striker causing all three poles of the switch to open automatically.

### 3.1.2 *Switch-fuse*

A switch in which one or more poles have a fuse in series in a composite unit.

### 3.1.3 *Fuse-switch*

A switch in which a fuse or a fuse-carrier with a fuse forms the moving contact.

### 3.1.4 *Switch-disconnector*

IEV 441-14-12.

### 3.1.5 *Fuse-base fuse-mount*

IEV 441-18-02.

### 3.1.6 *Striker*

IEV 441-18-18.

### 3.1.7 *Release-operated combination*

A combination in which automatic opening of the switch can also be initiated by either an over-current release or a shunt release.

NOTE - The release may be operated by either an over-current or an earth-fault relay.

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### 3.1.8 *Release*

IEV 441-15-17.

### 3.1.9 *Over-current release*

IEV 441-16-33.

### 3.1.10 *Shunt release*

IEV 441-16-41.

### 3.1.11 *Ambient air temperature*

IEV 441-11-13.

## 3.2 *Operation*

### 3.2.1 *Independent manual operation (of the switch)*

IEV 441-16-16.

### 3.2.2 *Dependent power operation (of the switch)*

IEV 441-16-14.