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**Niskonapetostne stikalne in krmilne naprave – 3. del: Stikala, ločilniki, ločilna stikala in stikalni aparati z varovalkami**

Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units (IEC 60947-3:1999)

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English version

**Low-voltage switchgear and controlgear  
Part 3: Switches, disconnectors, switch-disconnectors and  
fuse-combination units  
(IEC 60947-3:1999)**

Appareillage à basse tension  
Partie 3: Interrupteurs, sectionneurs,  
interrupteurs-sectionneurs et  
combinés-fusibles  
(CEI 60947-3:1999)

Niederspannungsschaltgeräte  
Teil 3: Lastschalter, Trennschalter,  
Lasttrennschalter und  
Schalter-Sicherungs-Einheiten  
(IEC 60947-3:1999)

This European Standard was approved by CENELEC on 1999-04-01. 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.

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**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 text of document 17B/952/FDIS, future edition 2 of IEC 60947-3, prepared by SC 17B, Low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60947-3 on 1999-04-01.

This European Standard supersedes EN 60947-3:1992 + corr. June 1997 + A1:1995 + corr. June 1997 + A2:1997.

The following dates were fixed:

- latest date by which the EN has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 2000-01-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2002-01-01

This standard is to be used in conjunction with EN 60947-1.

Annexes designated "normative" are part of the body of the standard.  
Annexes designated "informative" are given for information only.  
In this standard, annexes A and ZA are normative and annex B is informative.  
Annex ZA has been added by CENELEC.

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### Endorsement notice

The text of the International Standard IEC 60947-3:1999 was approved by CENELEC as a European Standard without any modification.

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**Annex ZA (normative)**

**Normative references to international publications  
with their corresponding 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 (including amendments).

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050(441)	1984	International Electrotechnical Vocabulary (IEV) Chapter 441: Switchgear, controlgear and fuses	-	-
IEC 60417-2	1998	Graphical symbols for use on equipment Part 2: Symbol originals	-	-
IEC 60617-7	1996	Graphical symbols for diagrams Part 7: Switchgear, controlgear and protective devices	EN 60617-7	1996
IEC 60947-1 (mod)	1996	Low-voltage switchgear and controlgear Part 1: General rules	EN 60947-1 <sup>1)</sup>	1997
IEC 60947-2	1995	Part 2: Circuit-breakers	EN 60947-2 + corr. June	1996 1997
IEC 60947-4-1	1990	Part 4: Contactors and motor-starters Section 1: Electromechanical contactors and motor-starters	EN 60947-4-1 + corr. June	1992 1997
IEC 60947-5-1	1997	Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1 + A11	1997 1997
IEC 61000-4-2	1995	Electromagnetic Compatibility (EMC) Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test - Basic EMC publication	EN 61000-4-2	1995
IEC 61000-4-3 (mod)	1995	Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	1996

1) EN 60947-1 is superseded by EN 60947-1:1999, which is based on IEC 60947-1:1999.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-4	1995	Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test - Basic EMC publication	EN 61000-4-4	1995
IEC 61000-4-5	1995	Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995
IEC 61000-4-6	1996	Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	1996
CISPR 11 (mod)	1997	Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement	EN 55011	1998
CISPR 22 (mod)	1997	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	EN 55022	1998

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INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC

60947-3

Deuxième édition  
Second edition  
1999-01

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**Appareillage à basse tension –**

**Partie 3:  
Interrupteurs, sectionneurs, interrupteurs-  
sectionneurs et combinés-fusibles**

**Low-voltage switchgear and controlgear –**

**Part 3:  
Switches, disconnectors, switch-disconnectors  
and fuse-combination units**

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International Electrotechnical Commission  
Международная Электротехническая Комиссия

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For price, see current catalogue

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –  
Part 3: Switches, disconnectors, switch-disconnectors  
and fuse-combination units**

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60947-3 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This standard shall be used in conjunction with IEC 60947-1.

This second edition cancels and replaces the first edition published in 1990, amendment 1 (1994) and amendment 2 (1997) as well as consolidated edition 1.2 (1998).

This second edition constitutes a technical revision.

The text of this standard is based on the first edition, amendment 1 and amendment 2 and the following documents:

SIST EN 60947-3:2000

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FDIS		Report on voting	
17B/952/FDIS		17B/968/RVD	

Full information as the voting for the approval of this standard can be found in the report voting indicated in the above table.

Annex A forms an integral part of this standard.

Annex B is for information only.

## LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

### Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

#### 1 General

The provisions of the general rules dealt with in IEC 60947-1 are applicable to this standard, where specifically called for. Clauses and subclauses, tables, figures and appendices of the general rules thus applicable are identified by reference IEC 60947-1, e.g., 4.3.4.1 of IEC 60947-1, table 4 IEC 60947-1, or annex A of IEC 60947-1.

##### 1.1 Scope and object

This standard applies to switches, disconnectors, switch-disconnectors and fuse-combination units to be used in distribution circuits and motor circuits of which the rated voltage does not exceed 1 000 V a.c. or 1 500 V d.c.

The manufacturer shall specify the type, ratings and characteristics according to the relevant standard of any incorporated fuses.

This standard does not apply to equipment coming within the scope of IEC 60947-2, IEC 60947-4-1 and IEC 60947-5-1; however, when switches and fuse-combination units coming into the scope of this standard are normally used to start, accelerate and/or stop an individual motor they shall also comply with the additional requirements given in annex A.

Auxiliary switches fitted to equipment within the scope of this standard shall comply with the requirements of IEC 60947-5-1.

This standard does not include the additional requirements necessary for electrical apparatus for explosive gas atmospheres.

NOTE 1 – Depending on its design, a switch (or disconnector) can be referred to as "a rotary switch (disconnector)", "cam-operated switch (disconnector)", "knife-switch (disconnector)", etc.

NOTE 2 – If they are not manually operated, switches and disconnectors may have to comply with additional requirements.

NOTE 3 – In this standard, the word "switch" also applies to the apparatus referred to in French as "commutateurs", intended to modify the connections between several circuits and *inter alia* to substitute a part of a circuit for another.

NOTE 4 – In general, throughout this standard switches, disconnectors, switch-disconnectors and fuse-combination units will be referred to as "equipment".

The object of this standard is to state

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- a) the characteristics of the equipment;
- b) the conditions with which the equipment shall comply with reference to
- 1) operation and behaviour in normal service;
  - 2) operation and behaviour in case of specified abnormal conditions, e.g. short circuit;
  - 3) dielectric properties;
- c) the tests for confirming that these conditions have been met and the methods to be adopted for these tests;
- d) the information to be marked on the equipment or made available by the manufacturer, e.g. in the catalogue.

## 1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(441):1984, *International Electrotechnical Vocabulary (IEV), Chapter 441: Switchgear, controlgear and fuses*

IEC 60417-2:1998, *Graphical symbols for use on equipment – Part 2: Symbol originals*

IEC 60617-7:1996, *Graphical symbols for diagrams – Part 7: Switchgear, controlgear and protective devices*

IEC 60947-1:1996, *Low-voltage switchgear and controlgear – Part 1: General rules*

IEC 60947-2:1995, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

IEC 60947-4-1:1990, *Low-voltage switchgear and controlgear – Part 4: Contactors and motor-starters – Section One: Electrotechnical contactors and motor-starters*

IEC 60947-5-1:1997, *Low-voltage switchgear and controlgear – Part 5: Control circuit devices and switching elements – Section One: Electromechanical control and circuits devices*

IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test. Basic EMC Publication*

IEC 61000-4-3:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test. Basic EMC Publication*

IEC 61000-4-5:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 5: Surge immunity test*

IEC 61000-4-6:1996, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 6: Immunity to conducted disturbances, induced by radio-frequency fields*

CISPR 11:1997, *Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement*

CISPR 22:1997, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*

## 2 Definitions

For the purposes of this part of IEC 60947, the definitions given in IEC 60050(441), IEC 60947-1 and the following apply

### 2.1

#### **switch (mechanical)**

a mechanical switching device capable of making, carrying and breaking currents under normal circuit conditions which may include specified operating overload conditions and also carrying for a specified time currents under specified abnormal circuit conditions such as those of short-circuit.

NOTE – A switch may be capable of making, but not breaking, short-circuit currents. [IEV 441-14-10]

### 2.2

#### **disconnecter**

a mechanical switching device which, in the open position, complies with the requirements specified for the isolating function.

NOTE 1 – This definition differs from IEC 441-14-05 by referring to isolating function instead of isolating distance.

NOTE 2 – A disconnecter is capable of opening and closing a circuit when either a negligible current is broken or made, or when no significant change in the voltage across the terminals of each of the poles of the disconnecter occurs. It is also capable of carrying currents under normal circuit conditions and carrying for a specified time currents under abnormal conditions such as those of short circuit.

### 2.3

#### **switch-disconnector**

a switch which, in the open position, satisfies the isolating requirements specified for a disconnecter [IEV 441-14-12]

### 2.4

#### **fuse-combination unit**

a combination of a mechanical switching device and one or more fuses in a composite unit, assembled by the manufacturer or in accordance with his instructions [IEV 441-14-04]

NOTE – (Not included in IEC 441-14-04.) This is a general term for fuse switching devices (see also definitions 2.5 to 2.10 and table 1)

### 2.5

#### **switch-fuse**

a switch in which one or more poles have a fuse in series in a composite unit [IEV 441-14-14]

### 2.6

#### **fuse-switch**

a switch in which a fuse-link or a fuse-carrier with fuse-link forms the moving contact [IEV 441-14-17]

### 2.7

#### **disconnecter-fuse**

a disconnecter in which one or more poles have a fuse in series in a composite unit [IEV 441-14-15]

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**2.8****fuse-disconnector**

a disconnector in which a fuse-link or fuse-carrier with fuse-link forms the moving contact [IEV 441-14-18]

**2.9****switch-disconnector-fuse**

a switch-disconnector in which one or more poles have a fuse in series in a composite unit [IEV 441-14-16]

**2.10****fuse-switch-disconnector**

a switch-disconnector in which a fuse-link or a fuse-carrier with fuse-link forms the moving contact [IEV 441-14-19]

**2.11****dependent manual operation (of a mechanical switching device)**

an operation solely by means of directly applied manual energy such that the speed and force of the operation are dependent upon the action of the operator [IEV 441-16-13]

**2.12****independent manual operation (of a mechanical switching device)**

a stored energy operation where the energy originates from manual power, stored and released in one continuous operation, such that the speed and force of the operation are independent of the action of the operator [IEV 441-16-16]

**2.13****semi-independent manual operation**

an operation solely by means of directly applied manual energy such that the manual force is increased up to a threshold value beyond which the independent switching operation is achieved unless deliberately delayed by the operator.

**2.14****stored energy operation (of a mechanical switching device)**

an operation by means of energy stored in the mechanism itself prior to the completion of the operation and sufficient to complete it under predetermined conditions [IEV 441-16-15]

NOTE – This kind of operation may be subdivided according to:

- a) the manner of storing the energy (spring, weight, etc.);
- b) the origin of the energy (manual, electric, etc.);
- c) the manner of releasing the energy (manual, electric, etc.).

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