



**SLOVENSKI STANDARD**  
**SIST EN 60947-1:2007/A1:2011**  
**01-marec-2011**

---

**Nizkonapetostne stikalne naprave - 1. del: Splošna pravila (IEC 60947-1:2007/A1:2010)**

Low-voltage switchgear and controlgear - Part 1: General rules (IEC 60947-1:2007/A1:2010)

Niederspannungsschaltgeräte - Teil 1: Allgemeine Festlegungen (IEC 60947-1:2007/A1:2010)

Appareillage à basse tension - Partie 1: Règles générales (CEI 60947-1:2007/A1:2010)

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 60947-1:2007/A1:2011](https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011)

**Ta slovenski standard je istoveten z: EN 60947-1:2007/A1:2011**

---

**ICS:**

29.130.20	Nizkonapetostne stikalne in krmilne naprave	Low voltage switchgear and controlgear
-----------	---	--

**SIST EN 60947-1:2007/A1:2011**                      **en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 60947-1:2007/A1:2011](https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011)

<https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60947-1/A1**

January 2011

ICS 29.130.20

English version

**Low-voltage switchgear and controlgear -  
Part 1: General rules  
(IEC 60947-1:2007/A1:2010)**

Appareillage à basse tension -  
Partie 1: Règles générales  
(CEI 60947-1:2007/A1:2010)

Niederspannungsschaltgeräte -  
Teil 1: Allgemeine Festlegungen  
(IEC 60947-1:2007/A1:2010)

This amendment A1 modifies the European Standard EN 60947-1:2007; it was approved by CENELEC on 2011-01-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 17B/1710/FDIS, future amendment 1 to IEC 60947-1:2007, 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 amendment A1 to EN 60947-1:2007 on 2011-01-01.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- |   |       |            |
|---|-------|------------|
| – latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2011-10-01 |
| – latest date by which the national standards conflicting with the amendment have to be withdrawn   | (dow) | 2014-01-01 |

Annex ZA has been added by CENELEC.

---

## Endorsement notice

The text of amendment 1:2010 to the International Standard IEC 60947-1:2007 was approved by CENELEC as an amendment to the European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- SIST EN 60947-1:2007/A1:2011  
<https://standards.iteh.ai/catalog/standards/sist/044c04fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011>
- |                        |  |
|------------------------|--|
| [5] IEC 60947-7-1      | NOTE Harmonized as EN 60947-7-1                  |
| [6] IEC 60998-2-2:2002 | NOTE Harmonized as EN 60998-2-2:2004 (modified). |

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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

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

*Add the following normative references to the existing list:*

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60664-3	2003	Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	2003
IEC 60664-5	2007	Insulation coordination for equipment within low-voltage systems - Part 5: Comprehensive method for determining clearances and creepage distances equal to or less than 2 mm	EN 60664-5	2007
IEC 60695-2-12	-	Fire hazard testing - Part 2-12: Glowing/hot-wire based test methods - Glow-wire flammability index (GWFI) test method for materials	EN 60695-2-12	-
IEC 60999-1	1999	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units - Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm <sup>2</sup> up to 35 mm <sup>2</sup> (included)	EN 60999-1	2000
IEC 60999-2	2003	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units - Part 2: Particular requirements for clamping units for conductors above 35 mm <sup>2</sup> up to 300 mm <sup>2</sup> (included)	EN 60999-2	2003
IEC 61557-2	-	Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 2: Insulation resistance	EN 61557-2	-

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 60947-1:2007/A1:2011](https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011)

<https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011>



IEC 60947-1

Edition 5.0 2010-12

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

AMENDMENT 1  
AMENDEMENT 1

Low-voltage switchgear and controlgear –  
Part 1: General rules

Appareillage à basse tension –  
Partie 1: Règles générales

STANDARD PREVIEW  
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011>

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

PRICE CODE  
CODE PRIX

W

ICS 29.130.20

ISBN 978-2-88912-291-2

## FOREWORD

This amendment has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

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

FDIS	Report on voting
17B/1710/FDIS	17/1721/RVD

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

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 60947-1:2007/A1:2011](https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011)

**1 General** <https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011>

*Replace the existing note of this clause by the following new note:*

NOTE The product standards forming the series of IEC standards covering low-voltage switchgear and controlgear are:

IEC 60947-2:	Part 2: Circuit-breakers
IEC 60947-3:	Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units
IEC 60947-4:	Part 4: Contactors and motor-starters
IEC 60947-5:	Part 5: Control-circuit devices and switching elements
IEC 60947-6:	Part 6: Multiple function equipment
IEC 60947-7:	Part 7: Ancillary equipment
IEC 60947-8:	Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines.



## 1.2 Normative references

Add the following normative references to the existing list:

IEC 60664-3:2003, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60664-5:2007, *Insulation coordination for equipment within low-voltage systems – Part 5: Comprehensive method for determining clearances and creepage distances equal to or less than 2 mm*

IEC 60695-2-12, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability test method for materials*

IEC 60999-1:1999, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm<sup>2</sup> up to 35 mm<sup>2</sup> (included)*

IEC 60999-2:2003, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 2: Particular requirements for clamping units for conductors above 35 mm<sup>2</sup> up to 300 mm<sup>2</sup> (included)*

IEC 61557-2, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 2: Insulation resistance*

ITEH STANDARD PREVIEW  
(standards.iteh.ai)

SIST EN 60947-1:2007/A1:2011

<https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011>

## 2 Definitions

Replace, in the alphabetical list, the existing references to these terms by the following new references:

Clamping unit.....	2.3.26
Multiple tip contact system .....	2.3.29
Prepared conductor .....	2.3.28
Screw-type terminal.....	2.3.24
Screwless-type terminal .....	2.3.25
Unprepared conductor .....	2.3.27

*This correction does not apply to the English text.*

Add, in the alphabetical list, the following new terms and references:

Connecting device.....	2.3.22
Electronically controlled electromagnet.....	2.3.32
Electronic overload relay with current or voltage asymmetry function.....	T.2.2
Electronic overload relay with ground/earth fault detection function .....	T.2.1
Electronic overload relay with phase reversal function.....	T.2.3
Electronic overload relay with over voltage function .....	T.2.4
Electronic overload relay with under power function .....	T.2.6
External control device.....	U.1.1
Inhibit current.....	T.2.5
Maximum cross-section.....	2.3.31
Minimum cross-section.....	2.3.30
Non-universal clamping unit.....	2.3.26.2
Non-universal terminal .....	2.3.25.2

Push-wire terminal.....	2.3.25.3
Terminal.....	2.3.23
Universal clamping unit.....	2.3.26.1
Universal terminal.....	2.3.25.1

Replace the existing terms and definitions 2.3.22 to 2.3.28 by the following new terms and definitions:

### 2.3.22

#### **connecting device**

a device for the electrical connection of one (or more) conductor(s), comprising one (or more) terminal(s), either fixed to a base or forming an integral part of the equipment

[IEC 60999-1:1999, 3.3]

### 2.3.23

#### **terminal**

conductive part of one pole of a device for electrical connection to external circuit, composed of one or more clamping unit(s) and insulation if necessary

[IEC 60999-1:1999, 3.2, modified]

### 2.3.24

#### **screw-type terminal**

terminal intended for the connection and disconnection of conductors or for the interconnection of two or more conductors, the connection being made, directly or indirectly, by means of screws or nuts of any kind

NOTE Examples are given in Annex D.  
<https://standards.iteh.ai/catalog/standards/sist/b44e64fc-90fc-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011>

### 2.3.25

#### **screwless-type terminal**

terminal intended for the connection and disconnection of conductors or for the interconnection on two or more conductors, the connection being made, directly or indirectly, by means of springs, wedges, eccentrics or cones, etc.

NOTE Examples are given in Annex D.

### 2.3.25.1

#### **universal terminal**

terminal for the connection and disconnection of all types of conductors (rigid and flexible)

[IEC 60998-2-2:2002, 3.101.1]

### 2.3.25.2

#### **non-universal terminal**

terminal for the connection and disconnection of a certain kind of conductor only (for example, solid conductors only or rigid [solid and stranded] conductors only)

[IEC 60998-2-2:2002, 3.101.2]

### 2.3.25.3

#### **push-wire terminal**

non-universal terminal in which the connection is made by pushing in rigid (solid or stranded) conductors

[IEC 60998-2-2:2002, 3.101.3]

**2.3.26****clamping unit**

the part(s) of the terminal necessary for the mechanical clamping and the electrical connection of the conductor(s), including the parts which are necessary to ensure the correct contact pressure

[IEC 60999-1:1999, 3.1]

**2.3.26.1****universal clamping unit**

clamping unit intended for all types of conductors

**2.3.26.2****non-universal clamping unit**

clamping unit intended for certain types of conductors only, for example:

- push-wire clamping unit for solid conductors only
- push-wire clamping unit for rigid (solid and stranded) conductors only

NOTE On push-wire clamping unit the connection is made by simple insertion of rigid conductors. (see 7.1.8.1)

**2.3.27****unprepared conductor**

conductor which has been cut and the insulation of which has been removed for insertion into a terminal

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

NOTE A conductor the shape of which is arranged for introduction into a terminal or the strands of which are twisted to consolidate the end is considered to be an unprepared conductor.

**2.3.28****prepared conductor**

conductor, the strands of which are soldered or the end of which is fitted with a cable lug, eyelet, etc.

SIST EN 60947-1:2007/A1:2011

<https://standards.iteh.ai/catalog/standards/sist/b44e646f-906f-4561-976f-2eb9c9a0c1c9/sist-en-60947-1-2007-a1-2011>

*Add, after definition 2.3.28, the following new terms and definitions 2.3.29 to 2.3.32 :*

**2.3.29****multiple tip contact system**

contact system comprising more than one contact gap per pole, which can be switched, in series and/or in parallel

**2.3.30****minimum cross-section**

value of the smallest connectable conductor cross-section stated by the manufacturer as suitable for the terminal

NOTE The manufacturer may declare several minimum cross-sections depending on the type of conductor, for example rigid, stranded, flexible, with or without ferrule.

**2.3.31****maximum cross-section**

value of the largest connectable conductor cross-section stated by the manufacturer as suitable for the terminal

NOTE 1 The manufacturer may declare several maximum cross-sections depending on the type of conductor, for example rigid, stranded, flexible, with or without ferrule.

NOTE 2 The term "rated cross-section" used in IEC 60947-7-1 and IEC 60999-2 and the term "rated connecting capacity" of a clamping unit used in IEC 60999-1 are considered equivalent when referring to certain thermal,

mechanical and electrical requirements, as stated by the manufacturer and as specified in their relevant product standard.

### 2.3.32

#### electronically controlled electromagnet

electromagnet in which the coil is controlled by a circuit with active electronic elements

## 4 Characteristics

*In the existing line "Rated ultimate short-circuit breaking capacity" of the list, replace "4.3.2.4" by "a".*

*In the existing line "Rated uninterrupted current" of the list, replace "a" by "4.3.2.4".*

### 4.5.1 Electrical control circuits

*Replace the existing title and text of this subclause by the following:*

#### 4.5.1 Electrically or electronically controlled circuits

Characteristics of electrical and electronic control circuits:

- type of current;
- rated frequency or d.c.;
- rated control circuit voltage  $U_c$  (a.c., d.c.);
- rated control supply voltage  $U_s$  (a.c., d.c.), where applicable;
- nature of external control circuit devices (contacts, sensors, optocouplers, electronic active components, etc);
- power consumption.

NOTE 1 In case of an electrical control circuit a distinction has been made above between the control circuit voltage  $U_c$ , which is the voltage which would appear across the "a" contacts (see 2.3.12) in the control circuit, and the control supply voltage  $U_s$ , which is the voltage applied to the input terminals of the control circuit of the equipment and may be different from the control circuit voltage, due to the presence of built-in transformers, rectified, resistors, etc.

NOTE 2 In case of an electronically control circuit a distinction is made between the control circuit voltage  $U_c$ , which is the controlling input signal, and the control supply voltage  $U_s$ , which is the voltage applied to energize the power supply terminals of the control circuit equipment and may be different from  $U_c$  due to the presence of built-in transformers, rectifiers, resistors, electronic circuitry, etc.

The rated control circuit voltage and rated frequency, if any, are the values on which the operating and temperature-rise characteristics of the control circuit are based. The correct operating conditions are based upon a value of the control supply voltage not less than 85 % of its rated value, with the highest value of control circuit current flowing, nor more than 110 % of its rated value.

The electronic part of an electronically controlled electromagnet may form an integral part or a separate part provided it is an intrinsic function of the device. In both cases, the device shall be tested with this electronic part mounted as in normal use.

Annex U gives examples and illustrations of different circuit configurations.

The ratings and characteristics of control circuit devices shall comply with the requirements of IEC 60947-5 (see the note of Clause 1).

### 4.7 Relays and releases

*Add, at the end of the existing list, the following new dashed item:*

- extended functions as given in Annex T.

#### 4.8 Co-ordination with short-circuit protective devices (SCPD)

*Replace the existing note by the following new note:*

NOTE IEC/TR 61912-1 gives guidance on co-ordination with SCPDs.

##### 5.1 Nature of information

*In the list of characteristics, add after “- rated impulse withstand voltage (see 4.3.1.3)”, the following new dashed item:*

- relay or release characteristics (see 4.7);

*Add the following new text before the existing note of this subclause:*

- length of insulation to be removed before insertion of the conductor into the terminal;
- maximum number of conductors which may be clamped.

For non-universal screwless terminals:

- “s” or “sol” for terminals declared for rigid-solid conductors;
- “r” for terminals declared for rigid (solid and stranded) conductors;
- “f” for terminals declared for flexible conductors.

In the case of electronically controlled electromagnets, other information may also be necessary, for example control circuit configuration (see 4.5 and Annex U).

##### 5.2 Marking

*Add, at the end of this subclause, the following new paragraphs:*

In the case of electronically controlled electromagnets, information other than that given in 5.1 may also be necessary (see also 4.5 and Annex U).

The indication “s”, “sol”, “r” or “f” for non-universal screwless terminals shall be marked on the device or, if the space available is not sufficient, on the smallest package unit or in technical information provided with the product.

In the case of a group of terminals located together, a single marking on the device is acceptable.

##### 7.1.2.1 General materials requirements

*Replace the first paragraph of this subclause by the following new paragraph:*

Parts of insulating materials which might be exposed to thermal stresses due to electrical effects within the equipment shall not be adversely affected by abnormal heat and by fire.

*Delete the existing last paragraph of this subclause.*

##### 7.1.2.2 Glow wire testing

*Replace the existing first three paragraphs of this subclause by the following new text:*

The suitability of materials used is verified by:

- a) making tests on the equipment; or