



SLOVENSKI STANDARD SIST EN 60947-1:1995

01-december-1995

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

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

Niederspannungsschaltgeräte -- Teil 1: Allgemeine Festlegungen

Appareillage à basse tension -- Partie 1: Règles générales

Ta slovenski standard je istoveten z: **EN 60947-1:1991/A11:1994**

[SIST EN 60947-1:1995](https://standards.iteh.ai/catalog/standards/sist/cecdaba-2ff8-4f88-92ab-617e532ab748/sist-en-60947-1-1995)

<https://standards.iteh.ai/catalog/standards/sist/cecdaba-2ff8-4f88-92ab-617e532ab748/sist-en-60947-1-1995>

ICS:

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

SIST EN 60947-1:1995

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60947-1:1995](#)

<https://standards.iteh.ai/catalog/standards/sist/cecdaba-2ffe-4f88-92ab-617e532ab748/sist-en-60947-1-1995>

EUROPEAN STANDARD

EN 60947-1

NORME EUROPEENNE

EUROPÄISCHE NORM

October 1991

UDC 621.316.542:620.1:001.4

Descriptors: Low-voltage switchgear and controlgear, characteristics, specification, test

ENGLISH VERSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR
PART 1: GENERAL RULES
(IEC 947-1:1988, modified)

Appareillage à basse tension
Première partie: Règles
générales
(CEI 947-1:1988, modifiée)

Niederspannung-Schaltgeräte
Teil 1: Allgemeine Festlegungen
(IEC 947-1:1988, modifiziert)

iTeh STANDARD PREVIEW
(standards.itech.ai)

This European Standard was approved by CENELEC on 1991-03-15. 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 947-1:1988 could be accepted without textual changes, has shown that some CENELEC common modifications were necessary for the acceptance as European Standard. The reference document, together with the common modifications prepared by the CENELEC Technical Committee TC 17B, was submitted to the CENELEC members for formal vote.

The text of the draft was approved by CENELEC as EN 60947-1 on 15 March 1991.

The following dates were fixed:

- latest date of publication of
an identical national standard (dop) 1992-06-30
- latest date of withdrawal of
conflicting national standards (dow) 1992-09-30

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

~~SIST EN 60947-1:1995~~
<https://standards.iteh.ai/catalog/standards/sist/cecddaba-2ffe-4f88-92ab-617e532ab748/sist-en-60947-1-1995>

INTRODUCTION

All subjects left "under consideration" in IEC 947-1:1988 are not part of this European Standard.

This means that:

- for the following clauses the title and text are to be replaced by "Vacant":

- 6.1.4 Shock and vibrations
- 7.1.1.1 Insulating materials
- 7.2.7 Leakage currents of equipment suitable for isolation
- 8.2.1 Materials
- 8.2.2 Equipment
- 8.2.4.6 Test for insertability of flat conductors with rectangular cross-section
- 8.2.5. Verification of strength of actuating system and position indicator of equipment suitable for isolation

- in the following clauses the appropriate paragraphs or notes are to be deleted:

- 7.1.1. Materials
- 7.2.3.5 Solid insulation
- 8.2.3 Enclosures for equipment
- 8.3.3.4.1 Type tests
- 8.3.3.5.4 Switching overvoltages
- 8.3.4.1.7 Behaviour of the equipment during short-circuit making and breaking tests
- Appendix F Determination of short-circuit power-factor or time-constant

Up-to-date information concerning the subjects dealt with in these clauses can be obtained from the secretariat of CENELEC TC 17B.

ENDORSEMENT NOTICE

The text of the International Standard IEC 947-1:1988, was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

8.3.2.1 General requirements

After the 6th paragraph add:

Screw terminals shall be tightened with a torque in accordance with Table IV or with the torque specified by the manufacturer, whichever is the greater.

8.3.3.4.1. 5) Verification of creepage distances

Add:

Note.- To facilitate the determination of the shortest creepage distance the manufacturer may provide relevant information, such as drawings.

8.3.3.4.2. Routine tests

Replace the text of this sub-clause by the following:

[https://standards.iteh.ai/catalog/standards/sist/cecddaba-2ffe-4f88-92ab-](https://standards.iteh.ai/catalog/standards/sist/cecddaba-2ffe-4f88-92ab-8/947-1-1988-1994)

The test requirements of the relevant product standard shall apply.

Appendix H Correlation between the nominal voltage of the supply system and the rated impulse withstand voltage of equipment

Add after the title:

Note.- This appendix is due to be updated.

ANNEX ZA (normative)

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

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

IEC <u>Publication</u>	<u>Date</u>	<u>Title</u>	<u>EN/HD</u>	<u>Date</u>
50(151)	1978	International Electrotechnical Vocabulary (IEV) - Chapter 151: Electrical and magnetic devices	-	-
50(441)	1984	Chapter 441: Switchgear, controlgear and fuses	-	-
50(604)	1987	Chapter 604: Generation, transmission and distribution of electricity Operation	-	-
50(826)	1982	Chapter 826: Electrical installations of buildings	HD 384.2 S1	1986
60 - series		High-voltage test techniques	-	-
71-1	1976	Insulation co-ordination - Part 1: Terms, definitions, principles and rules	-	-
73	1984	Colours of indicator lights and push-buttons	HD 354 S2	1987
85	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
99-1	1970	Lightning arresters - Part 1: Non-linear resistor type arresters for a.c. systems	-	-
112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980
144*	1963	Degrees of protection of enclosures for low-voltage switchgear and controlgear	-	-
216 - series		Guide for the determination of thermal endurance properties of electrical insulating materials	-	-

* IEC 144 is superseded by IEC 947-1

IEC				
<u>Publication</u>	<u>Date</u>	<u>Title</u>	<u>EN/HD</u>	<u>Date</u>
269-1	1986	Low-voltage fuses - Part 1: General requirements	EN 60269-1	1989
269-2	1986	Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application)	-	-
364-4-443	-	Electrical installations of buildings Part 4: Protection for safety Chapter 44: Protection against over-voltages - Section 443: Protection against overvoltages of atmospheric origin (In preparation)	-	-
417	1973	Graphical symbols for use on equipment Index, survey and compilation of the single sheets	HD 243 S1*	1984
439-1, mod	1985	Low-voltage switchgear and controlgear assemblies - Part 1: Requirements for type-tested and partially type-tested assemblies	EN 60439-1	1990
445	1973	Identification of apparatus terminals and general rules for a uniform system of terminal marking using an alpha-numeric notation	HD 241 S1*	1978
447	1974	Standard directions of movement for actuators which control the operation of electrical apparatus	HD 331 S1	1977
529	1976	Classification of degrees of protection provided by enclosures	HD 365 S1*	1978
617-7	1983	Graphical symbols for diagrams Part 7: Switchgear, controlgear and protective devices	-	-
664	1980	Insulation co-ordination within low-voltage systems including clearances and creepage distances for equipment	-	-
+ 664A	1981	First Supplement		

* HD 243 S1 is superseded by HD 243 S9:1991, which includes supplements A:1974 to J:1990 to IEC 417

* HD 241 S1 is superseded by EN 60445:1990 which is based on IEC 445:1988

* HD 365 S1 is superseded by EN 60529:1991 which is based on IEC 529:1989

EUROPEAN STANDARD

EN 60947-1/A11

NORME EUROPEENNE

EUROPÄISCHE NORM

May 1994

UDC 621.316.542:620.1:001.4

Descriptors: Low-voltage switchgear and controlgear, characteristics, specification, test

Amendment A11 to the English version of EN 60947-1

Low-voltage switchgear and controlgear
Part 1: General rules

Appareillage à basse tension
Première partie: Règles
générales

Niederspannung-Schaltgeräte
Teil 1: Allgemeine Festlegungen

This amendment A11 modifies the European Standard EN 60947-1:1991. It was approved by CENELEC on 1994-03-08. 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, 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

© 1994 Copyright reserved to CENELEC members

Ref. No. EN 60947-1:1991/A11:1994 E

Foreword

This amendment to EN 60947-1:1991 was prepared by CENELEC Technical Committee TC 17B, Low-voltage switchgear and controlgear including dimensional standardization.

The draft was submitted to the Unique Acceptance Procedure (UAP) in July 1993 and was approved by CENELEC as amendment A11 to EN 60947-1:1991 on 1994-03-08.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1995-03-15
- latest date of withdrawal of conflicting national standards (dow) 1995-03-15

For products which have complied with EN 60947-1:1991 before 1995-03-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-03-15.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60947-1:1995

<https://standards.iteh.ai/catalog/standards/sist/cecddaba-2ffe-4f88-92ab-617e532ab748/sist-en-60947-1-1995>

Add the following :

7.3 - Electromagnetic compatibility (EMC)

7.3.1 - General

The requirements and associated tests given in this standard are applicable to each product of TC 17B. However product standards may prescribe other tests and severity levels taking into account the environmental conditions.

To each the majority of applications, 2 families of environment are considered ; they will be referred to Environment 1 and Environment 2.

Environment 1 : Mainly relates to low-voltage public network such as (see EN 50082-1 clause 5) residential, commercial and light industrial locations/ installations. Highly disturbing sources such as arc welders are not covered by this environment.

Environment 2 : Mainly relates to low-voltage non-public or industrial networks/locations/installations (see EN 50082-2 clause 4) including highly disturbing sources.

7.3.2 - Immunity

7.3.2.1 - Equipment not incorporating electronic circuits

Equipment not incorporating electronic circuits are not sensitive to normal electromagnetic disturbances and therefore no immunity tests are required.

7.3.2.2 - Equipment incorporating electronic circuits

Equipment incorporating electronic circuits shall have a satisfactory immunity to electromagnetic disturbances.

SIST EN 60947-1:1995

See 8.4 for the appropriate tests to verify the compliance with these requirements.

Performance criteria according to clause 6 of EN 50082-1 shall be given in each relevant product standard.

NOTE : A simple rectifier circuit is not sensitive to normal electromagnetic disturbances and does not therefore require immunity test.

7.3.3 Emission

7.3.3.1 - Equipment not incorporating electronic circuits

For equipment not incorporating electronic circuits electromagnetic disturbances can only be generated by equipment during occasional switching operations. The duration of the disturbances is of the order of milliseconds.

The frequency, the level and the consequences of these emissions are considered as part of the normal electromagnetic environment of low-voltage installations.

Therefore the requirements for electromagnetic emission are deemed to be satisfied and no verification is necessary.

7.3.3.2 - Equipment incorporating electronic circuits

Equipments incorporating electronic circuits (e.g. chopped supply, circuits incorporating microprocessors with high frequency clocks) may generate continuous electromagnetic disturbances. For such continuous emission they shall comply with EN 50081-1 or EN 50081-2 as relevant.

Add :

8.4 Tests for EMC

Type of test	Severity level required (1)
1,2/50 μ s 8/20 surges IEC 1000-4-5 (under consideration)	2 kV (CM) * 1 kV (DM) *
Fast transient bursts IEC 801-4	2 kV
Electromagnetic field IEC 801-3	10 V/m
Electrostatic disturbances IEC 801-2	8 kV/air discharge
(1) This corresponds to level 3 in IEC 801. Statistical evaluations of measurement have shown that there is a low risk of switching overvoltages higher than level 3 (*) CM : Common mode (*) DM : Differential mode.	

SIST EN 60947-1:1995

<https://standards.iteh.ai/catalog/standards/sist/cecddaba-2ffe-4f88-92ab-617e532ab748/sist-en-60947-1-1995>

Annex ZA (normative)

Other international publications quoted in this standard with the references of the relevant European publications

Add :

European Standards

EN 50081-1	1992	Electromagnetic compatibility - Generic emission standard Part 1 : Residential, commercial and light industry
EN 50082-2	1993	Part 2 : Industrial environment
EN 50082-1	1992	Electromagnetic compatibility - Generic immunity standard Part 1 : Residential, commercial and light industry
EN 50082-2 (under consideration)		Part 2 : Industrial environment

Add to the list of IEC publications :

801-2	1991	Electromagnetic compatibility for industrial-process measurement and control equipment Part 2 : Electrostatic discharge requirements	EN 60801-2	1993
801-3	1984	Part 3 : Radiated electromagnetic field requirements	HD 481.3.S1	1987
801-4	1988	Part 4 : Electrical fast transient/burst requirements	-	-
1000-4-5 (under consideration)		Electromagnetic compatibility Part 4 : Testing and measuring technics Section 5 : Surge immunity test		

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60947-1:1995](#)

<https://standards.iteh.ai/catalog/standards/sist/cecddaba-2ffe-4f88-92ab-617e532ab748/sist-en-60947-1-1995>

NORME INTERNATIONALE INTERNATIONAL STANDARD

CEI
IEC
947-1

Première édition
First edition
1988



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

Appareillage à basse tension

Première partie: Règles générales

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60947-1:1995

<https://standards.iteh.ai/catalog/standards/sist/cecdaba-2ff8-4f88-92ab-617e532ab748/sist-en-60947-1-1995>

Low-voltage switchgear and controlgear

Part 1: General rules

ГОСТ Р 51330.1-2006: Низковольтные коммутационные аппараты и аппараты управления