



SLOVENSKI STANDARD

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Switches for household and similar fixed electrical installations - Part 2-1: Particular requirements - Electronic switches

Switches for household and similar fixed electrical installations -- Part 2-1: Particular requirements - Electronic switches

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Schalter für Haushalt und ähnliche ortsfeste elektrische Installationen -- Teil 2-1:
Besondere Anforderungen - Elektronische Schalter

SIST EN 60669-2-1:2001

Interrupteurs pour installations électriques fixes domestiques et analogues -- Partie 2-1:
Prescriptions particulières - Interrupteurs électroniques

Ta slovenski standard je istoveten z: **EN 60669-2-1:2000**

ICS:

29.120.40 Stikala Switches

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EUROPEAN STANDARD

EN 60669-2-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2000

ICS 29.120.40

Supersedes EN 60669-2-1:1996 + A11:1997

English version

Switches for household and similar fixed electrical installations
Part 2-1: Particular requirements - Electronic switches
 (IEC 60669-2-1:1996 + A1:1997, modified)

Interrupteurs pour installations électriques
 fixes domestiques et analogues
 Partie 2-1: Prescriptions particulières -
 Interrupteurs électroniques
 (CEI 60669-2-1:1996 + A1:1997,
 modifiée)

Schalter für Haushalt und ähnliche
 ortsfeste elektrische Installationen
 Teil 2-1: Besondere Anforderungen -
 Elektronische Schalter
 (IEC 60669-2-1:1996 + A1:1997,
 modifiziert)

This European Standard was approved by CENELEC on 2000-04-01. 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.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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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 the International Standard IEC 60669-2-1:1996 and its amendment 1:1997, prepared by IEC SC 23B, Plugs, socket-outlets and switches, of IEC TC 23, Electrical accessories, together with the common modifications prepared by the Technical Committee CENELEC TC 23B, Switches for household and similar fixed electrical installations, was submitted to Unique Acceptance Procedure and was approved by CENELEC as EN 60669-2-1 on 2000-04-01.

This European Standard replaces EN 60669-2-1:1996 and its amendment A11:1997. It shall be used in conjunction with EN 60669-1:1999.

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) 2001-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-10-01

Annexes designated "normative" are part of the body of this standard.

Annexes designated "informative" are given for information only.

In this standard, Annexes ZA and ZB are normative and annexe AA is informative.

Annexes ZA and ZB have been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60669-2-1:1996 and its amendment 1:1997 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

1 Scope

Replace in the 3rd line of the 3rd paragraph "e.g. heating installations" by "e.g. heating controls".

Delete in the 1st line of the 4th paragraph the word "intentionally".

Add after the 4th paragraph:

This standard also applies to electronic switches where the operation or control is made by physical means, e.g. light, wind velocity, presence of persons, etc.

Add to note 1 "or EN 61058-1".

2 Normative references

Replace the text of clause 2 by:

NOTE - Normative references to international publications are listed in Annex ZA (normative).

3 Definitions

3.105 **Replace** in the 2nd dashed text of note 2 "after zero crossing half-wave" by "after zero crossing in each half-wave".

3.108 **Delete** at the end:
"via electronic components"

5 General notes on tests

Replace the text of clause 5 by:

This clause of part 1 applies with the following modifications:

5.4 **Replace** the 2nd paragraph by the following two paragraphs:

Three specimens are subjected to all the relevant tests, except for the tests of 18.2 and 19.1 where one further set of three specimens is used (or two further sets for switches of pattern number 2), and the tests of clause 24 where another three specimens are used.

For each test sequence of clause 26 and 101 three new specimens are used as shown in table 101.

Table 101

Type of switch	Number for general tests	Additional specimens for clause or subclause				
		18.2	19.1	24	26	101
Marked with one rated current and: - one voltage	3	3 ¹⁾	3 ¹⁾	3	3	3
- two voltages	6	6 ¹⁾	6 ¹⁾	6	6	6
1) For electronic switches with mechanical and electromechanical switching devices, only the complete contact mechanism may be submitted.						

NOTE 1 - For checking compliance with the EMC requirements only the tests of clause 26 have to be carried out.

NOTE 2 - The manufacturer may submit the same set of specimens to one or more test sequences as an alternative to the table, provided all the tests are carried out on one set of three specimens.

6 Rating

6.2 Replace the text by:

This subclause of part 1 does not apply.

Add a new subclause 6.3:

6.3 The preferred rated supply frequencies are 50 Hz and/or 60 Hz.

8 Marking

8.1 Replace the 1st line of the 1st dashed text "- Note to the first paragraph :" by : "- Note to the first dashed text :"

8.3 Replace the existing text by the following:

Replace the 1st line and the first dashed text by :

The following marking shall be placed on the main part of the electronic switch :

- the rated current or rated load, rated voltage, nature of supply, rated frequency, kind of load, the rating and type of any fuse.

Add after the last dashed text the following paragraph:

The rating and type of fuse shall be marked on the fuse-holder or in proximity of the fuse.

Add the following note: [SIST EN 60669-2-1:2001](https://standards.iteh.ai/catalog/standards/sist/7a8ec8ac-12e0-46f8-830a-45780f84928a/sist-en-60669-2-1-2001)

NOTE 2 - The value for minimum load or minimum current may also be given in the installation instructions.

Renumber the present notes 2 and 3 as 3 and 4, respectively.

8.6.101 Delete this subclause.

10 Protection against electric shock

10.1 Replace in the 3rd paragraph "figure 2" by "figure 9".

10.2 Add before the 1st paragraph:

For touch sensitive switches the associated protective impedance does not have to comply with the requirements of clauses 16 and 23.

Replace the 2nd paragraph by:

The protective impedance shall consist of at least two resistors or independent capacitors in series of the same nominal value or a combination of both. These resistors shall comply with the requirements given in 102.3, and the capacitors shall comply with the requirements given in 102.2.

Delete the last paragraph.

10.101 Add the following new paragraph:

Compliance is checked with the standard test finger as shown in figure 9 of part 1.

13 Constructional requirements

13.101 Delete this subclause.

16 Insulation resistance and electric strength

Add after the first paragraph of part 1:

Insulation resistance and electric strength are measured with the protective impedances according to 10.2 disconnected.

16.2 Replace in the first line "table 13" by "table 14".

17 Temperature rise

Replace in the 6th paragraph "table 2" by "table 15".

Replace the 8th paragraph, the new paragraph added by A1 and note 1 by:

Electronic switches for motors are loaded in accordance with the manufacturer's instructions. The rated load shall be determined with the electronic switch short-circuited. <https://standards.iteh.ai/catalog/standards/sist/7a8ec8ac-12e0-46f8-830a-45780f84928a/sist-en-60669-2-1-2001>

Other electronic switches are loaded with the types of load as stated in the manufacturer's instructions. The rated load shall be determined with the electronic switch short-circuited.

Replace the 9th paragraph by the following two paragraphs:

In the case of motor speed controls the electronic switches are loaded until steady-state temperature at a voltage between 0,9 and 1,1 times rated voltage is reached, whichever is more unfavourable.

For other electronic switches the test is carried out at 1,1 times the rated voltage.

Replace in table 102, the 4th row, the description of winding wires and relevant temperature rises by:

	Clause 17	Clause 101
Windings (note 4)		
Class A	75	115
Class E	90	130
Class B	95	140
Class F	115	155
Class H	140	175
Class 200	160	195
Class 220	180	215
Class 250	210	245

Replace note 1 in table 102 by:

1 - For areas not likely to be touched in normal use, temperature rises up to 75 K are allowed under normal operating conditions.

18 Making and breaking capacity

Replace in the 6th paragraph "separate" by "new".

Add after the 7th paragraph the following dashed text and note:

- for low-voltage incandescent lamps as specified in 18.1 and 18.2 of part I and for electronic switches for the control of the voltage of iron core transformer for low-voltage incandescent lamps as specified in 18.1, 18.2 and 18.102.

NOTE 3 - For electronic switches whose cycle of operation is limited by their application (e.g. passive infra-red, time delay switches, etc), the rate of operation during the tests may be specified by the manufacturer

Replace in the 8th paragraph "figure 10" by "figure 12".

18.101 Replace "18.101 Additional subclause" by :

Additional subclauses :

18.101 The contact mechanism.....

18.102 Replace in the 1st paragraph the words "Electronic switches" by:
The electronic switches for the control of the voltage of iron core transformers.

19 Normal operation

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[https://standards.iteh.ai/catalog/standards/sist/7a8ec8ac-12e0-46f8-830a-](https://standards.iteh.ai/catalog/standards/sist/7a8ec8ac-12e0-46f8-830a-675d84529496/en-60669-2-1:2001)

19.1 Replace in the 2nd paragraph "separate" by "new".

Replace in the 3rd paragraph the words "switches S1 and S2" by "switch S".

Add after the 3rd paragraph the following note:

NOTE - For electronic switches whose cycle of operation is limited by their application (e.g. passive infra-red, time delay switches, etc), the rate of operation during the tests may be specified by the manufacturer.

Replace the 6th paragraph by :

For rotary electronic switches of pattern N° 1 and 2 intended to be operated in either directions the actuating member is turned in one direction for half the total number of operation and in the reverse direction for the reminder.

Add at the end of the 8th paragraph: "if applicable".

19.3 Replace the 2nd paragraph by:

The electronic switch is loaded with its rated load and the voltage is then increased to 1,1 times the rated voltage, the setting is altered 10000 times over the whole range from minimum to maximum and back to minimum by means of its control unit, the rate of operation being between 10 and 15 operations per minute.

Add the following note:

NOTE - Mechanical control units are push buttons, potentiometers, etc. requiring a manual operation.

19.4 Add at the end the following 4th paragraph:

During the test, the electronic switch shall function correctly.

23 Creepage distances, clearances and distances through sealing compound

Replace by:

This clause of part 1 applies with the following additions:

The values given in items 1, 2, 6 and 7 of table 20 apply only to terminals for external wiring.

The values of items 1, 2, 6 and 7 of table 20 do not apply to live parts, with the exception of terminals for external wiring, which are protected by a directly associated fuse with adequate breaking capacity or other current-limiting means, under the provision that the requirements of clause 101 are fulfilled. If there is no associated fuse or directly associated fuse, or other current-limiting means the electronic switch shall comply with table 20.

NOTE - An associated fuse, a directly associated fuse and/or current limiting device are devices inserted in the circuit and whose primary function is to protect the electronic switch.

26 EMC requirements

Add the following before the text:

This clause of Part 1 is replaced by :

Replace in the last line of the 1st paragraph the reference "IEC 1000-2-2" by "IEC 61000-2-2".

Add after the 2nd paragraph the following paragraph:

For electronic switches designed to operate a load via a transformer, the manufacturer shall specify all details related to the load.

NOTE - Measured values within the test limits are acceptable for the test results until the situation on uncertainty of measurement is clarified by TC 210.

26.1 Replace the 1st paragraph by:

For the following tests, the electronic switch is mounted as in normal use in the relevant box, if any, as specified by the manufacturer and is loaded as specified in clause 17, so that at rated voltage, the rated load will be obtained.

For the purpose of this test, the electronic switch is set to the measured or calculated value of the output power (rms).

A variation of less than $\pm 10\%$ is not considered to be a change of setting.

26.1.1 Replace the 3rd paragraph from the end by:

During this test the electronic switch state and/or setting may alter.

Replace the last paragraph by :

After the test, the electronic switch state shall be in the original switch state and the setting shall be unchanged.

26.1.2 Replace the 3rd paragraph from the end by:

The test is carried out according to IEC 61000-4-5 by applying ten times, at a repetition rate of $30 \text{ s} \pm 5 \text{ s}$, an open circuit test voltage of 1 kV (level 2).

26.1.3 Replace the last paragraph by :

After the test, the electronic switch state shall be in the original switch state and the setting shall be unchanged.

NOTE - If any change in the setting occurs, it should be possible to restore the setting by operation of the control(s).

26.1.4 Replace the last paragraph and the note by:

After the test, the electronic switch state shall be in the original switch state and the setting shall be unchanged.

NOTE 1 - If any change in the setting occurs, it should be possible to restore the setting by operation of the control(s).

NOTE 2 - Certain electronic switches (e.g. passive infrared switches - PIR switches) with adjustable time delay should be adjusted in such a way that the time delay is higher than the testing time.

26.1.5 Replace the first three paragraphs by:

Electronic switches shall be tested for resistance to electromagnetic fields such as those generated by portable radio transceivers or any other device that will generate continuous wave radiated electromagnetic energy.

The test is carried out according to IEC 61000-4-3 by applying a field strength of 3 V/m.

Replace the last paragraph by:

After the test, the electronic switch state shall be in the original switch state and the setting shall be unchanged.

26.2.1 Replace the text of this subclause by:

Electronic switches shall be so designed that they do not cause excessive disturbances in the network.

Requirements are deemed to be met if the electronic switch complies with EN 61000-3-2 and EN 61000-3-3.

26.2.2 Replace the 2nd paragraph by:

The requirement is deemed to be met if the electronic switch complies with the requirements of EN 55014 or EN 55015 as appropriate.

101 Abnormal conditions**101.1.1.1 Add in the 5th paragraph "approximately" before "2 min".**

Delete the last two paragraphs.

102 Components**102.4.1.1 Replace the 2nd dashed text by:**

- For cut-outs in electronic switches for fluorescent lamps, the tests shall be carried out in the same way as for electronic switches for incandescent lamps.

102.4.1.2 Replace the note by the following test requirements :

For cut-outs in electronic switches for fluorescent lamps, the tests shall be carried out in the same way as for electronic switches for incandescent lamps.

Annex AA

Replace in the 2nd column, 6th row, the word "mechanically" by "mechanical".

Replace in the 2nd column, 7th row, the text by :

Mechanically operated regulator with an electronic control circuit and an electronically operated mechanical switching device.

Add the following row: **(standards.iteh.ai)**

Incorporating heat or light sensors	Electronically operated semiconductor switching device
	Electronically operated mechanical switching device

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 60065 (mod) + A2 (mod) + A3 (mod)	1985 1989 1992	Safety requirements for mains operated electronic and related apparatus for household and similar general use	EN 60065 + A11 ¹⁾	1993 1997
IEC 60085	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
IEC 60127	Series	Miniature fuses	EN 60127	Series
IEC 60161	1965	Capacitors for radio interference suppression	-	-
IEC 60317-0-1	1990	Specifications for particular types of winding wires Part 0: General requirements Section 1: Enamelled round copper wire	EN 60317-0-1 ²⁾	1994
IEC 60730 (mod)	Series	Automatic electrical controls for household and similar use	EN 60730	Series
IEC 61000-2-2 (mod)	1990	Electromagnetic compatibility (EMC) Part 2: Environment -- Section 2: Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems	ENV 61000-2-2	1993
IEC 61000-3-2	1995	Part 3: Limits - Section 2: Limits for harmonic current emissions (equipment input current up to and including 16A per phase)	EN 61000-3-2 + corr. July + A1	1995 1997 1998
IEC 61000-4-2	1995	Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	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
IEC 61000-4-4	1995	Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	1995

1) EN 60065:1993 + A11:1997 are superseded by EN 60065:1998, which is based on IEC 60065:1998, mod.

2) EN 60317-0-1:1994 is superseded by EN 60317-0-1:1998, which is based on IEC 60317-0-1:1997.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-5	1995	Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995
IEC 61000-4-11	1994	Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11	1994
IEC 61058-1	1990	Switches for appliances – Part 1: General requirements	EN 61058-1	1992
CISPR 14-1	1993	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus Part 1: Emission - Product family standard	EN 55014-1	1993
CISPR 15	1996	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	EN 55015	1996
ISO 306	1987 ³⁾	Plastics - Thermoplastics materials - Determination of Vicat softening temperature	-	-

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3) ISO 306:1987 is superseded by ISO 306:1994.

Annex ZB (normative)**Special national conditions**

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions. If it affects harmonization, it forms part of the European Standard or Harmonization Document.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

<u>Clause</u>	<u>Special national condition</u>
101.1.1.2	Belgium, France, Spain, Switzerland Electronic switches designed without an associated incorporated protection are loaded for one hour with the conventional tripping current of the associated protection of the lighting circuit (10 A for fuses and 16A for CB's).
102.1	United Kingdom Fuses according to BS 646 and BS 1362 are deemed to satisfy this requirement.

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**NORME
INTERNATIONALE
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**CEI
IEC**

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**Interrupteurs pour installations électriques
fixes domestiques et analogues –**

**Partie 2:
Prescriptions particulières –
Section 1: Interrupteurs électroniques**

**Switches for household and similar
fixed electrical installations –**

**Part 2:
Particular requirements –
Section 1: Electronic switches**

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