SLOVENSKI STANDARD
SIST EN 60669-1:1996

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Switches for household and similar fixed electrical installations - Part 1: General requirements (IEC 669-1:1993, modified)

Switches for household and similar fixed electrical installations -- Part 1: General requirements

Schalter für Haushalt und ähnliche ortsfeste elektrische Installationen -- Teil 1: Allgemeine Anforderungen

Interrupteurs pour installations électriques fixes domestiques et analogues -- Partie 1: Prescriptions générales

Ta slovenski standard je istoveten z: **EN 60669-1:1995**

ICS:

29.120.40	Stikala	Switches

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Descriptors: Switches for household use Umax = 440 V r.m.s., requirements, classification, testing, properties, definitions, electrical safety requirements, materials testing

English version

Switches for household and similar fixed electrical installations
Part 1: General requirements
(IEC 669-1:1993, modified)

Interrupteurs pour installations électriques fixes domestiques et analogues
Partie 1: Prescriptions générales
(CEI 669-1:1993, modifiée)

Schalter für Haushalt und ähnliche ortsfeste elektrische Installationen
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This European Standard was approved by CENELEC on 1995-07-04. 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

Ref. No. EN 60669-1:1995 E

Foreword

The text of the International Standard IEC 669-1:1993, prepared by SC 23B, Plugs, socket-outlets and switches, of IEC TC 23, Electrical accessories, together with common modifications prepared by the Technical Committee CENELEC TC 23B, Switches for household and similar fixed electrical installations, was submitted to the formal vote and was approved by CENELEC as EN 60669-1 on 1995-07-04.

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) 1996-01-15
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-10-15

For products which have complied with the relevant national standard before 2005-10-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2010-10-15.

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

Endorsement Notice

The text of the International Standard IEC 669-1 : 1993 was approved by CENELEC as a European Standard with agreed common modifications as given below:

COMMON MODIFICATIONS

1 Scope

Replace the second paragraph by :

The rated current is limited to 16 A for switches provided with screwless terminals.

Delete note 1.

Add after note 2 the following :

Unless otherwise specified in subsequent parts, this standard applies to switches intended to be used at 50 Hz.

2 Normative references

Replace the text of clause 2 by:

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

3 Definitions

3.1.3 **Replace** by "void".

Add the following definitions:

3.21 **type test:** (IEV 151-04-15) A test of one or more switches made to a certain design to show that the design meets certain specifications.

3.22 **routine test:** (IEV 151-04-16) A test to which each individual switch is subjected during and/or after manufacture to ascertain whether it complies with certain criteria.

3.23 **actuating member:** (IEV 442-04-16) A part which is pulled, pushed or turned or otherwise moved to cause an operation.

3.24 **surface-type switch:** A switch, which when mounted, projects wholly above the surface on which it is mounted.

3.25 **flush-type switch:** A switch mainly intended to be mounted in a flush-type box.

3.26 **semi flush-type switch:** A switch mainly intended to be mounted in a semi flush-type box.

3.27 **panel-type switch** A switch mainly intended for mounting to a panel having an aperture through which the intended accessible surface of the switch protrudes.

3.28 **architrave-type switch:** A switch having a cover plate of such proportions that it may be accommodated within an architrave.

3.29 **live part:** (IEV 826-03-01) A conductor or conductive part intended to be energised in normal use, including a neutral conductor but, by convention not a PEN conductor.
Note: A protective conductor (PE) is not a live part.

4 General requirements

Add the following sentence after the first paragraph:

Where tolerances are not specified in this standard the values are to be regarded as nominal.

5 General notes on tests

5.4 **Replace** the 10th paragraph by:

Switches marked with a dual voltage are tested at the higher voltage.

Replace the last paragraph by:

Momentary contact switches or time delay switches are not to be submitted to the tests of 18.2 and 19.2.

NOTE - A table showing the number of specimens needed for the test is given in Annex A.

5.5 **Replace** the first and second paragraphs by:

Unless otherwise stated, three specimens are submitted to all the tests and the requirements are satisfied if all the tests are met.
If only one of the specimens does not satisfy a test due to an assembly or manufacturing fault, that test and any preceding one which may have influenced the results of the test shall be repeated and also the tests which follow shall be made in the required sequence on another full set of specimens, all of which shall comply with the requirements.

6 Ratings

6.1 **Replace** the first and second paragraphs by:

Switches shall preferably have rated voltages of 250 V and 400 V.

The values 230 V, 380 V and 440 V may be used.

For momentary contact switches or time delay-switches, the standard voltages are 130V and 250V.

6.2 **Add** in the first paragraph "45A" after "40A".

Replace the second paragraph by:

The rated current shall not be less than 6A, except that rated currents of 1A, 2A and 4A are allowed for momentary contact switches, electromagnetic remote control switches and time delay switches.

7 Classification

7.1.4 **Delete** in the second dashed text the word "splash-proof".

Delete in the third dashed text the word "jet-proof".

7.1.7 **Add:**
See Annex ZB for special national conditions.

7.2 **Add** in table 1, Column 1, the value "45" after "40".

8 Marking

8.1 **Add:**
See Annex ZB for special national conditions.

8.3 **Replace** in the last paragraph before the notes the words "on removal of any cover or cover plate which may be present when the switch is mounted and wired as in normal use" by "during installation".

Add:
See Annex ZB for special national conditions.

8.6 **Replace** the first sentence of the first paragraph by:

If switches of pattern numbers 2, 3, 03 and switches having a rated voltage exceeding 250 V and rated current exceeding 16A are marked to indicate the switch position , they shall be so marked that

the direction of the movement of the actuating member to its different positions or the actual switch position is clearly indicated."

Delete the last but one paragraph and the relevant note 2.

8.8 **Change** note 2 into a requirement and **replace** the first sentence of the note by:

If special precautions are necessary in order to ensure that, after installation, the conditions necessary to meet the requirements of this standard are achieved, in that case, the instruction sheet shall include clear information with regard to the following:

9 Checking of dimensions

Add after the first paragraph:

The manufacturer of the switch shall specify in his catalogue the type of boxes (flush or surface, etc) in which his switches are to be mounted.

10 Protection against electric shock

10.2 **Add:**
See Annex ZB for special national conditions.

10.3 **Replace** the words "covers or cover plates" by "covers, cover plates and other parts of the enclosure".

10.3 a) and c) **Replace** the words "covers or cover plates" by "covers, cover plates and other parts of the enclosure".

Add:
See Annex ZB for special national conditions.

10.3.1 **Replace** in the text the words "covers or cover plates" by " covers, cover plates and other parts of the enclosure".

10.3.2 **Replace** in the text the words "covers or cover plates" by "covers, cover plates and other parts of the enclosure"

Add:
See Annex ZB for special national conditions.

10.5 **Replace** note 1 by:
See Annex ZB for special national conditions.

11 Provision for earthing

11.1 **Change** notes 1 and 2 into requirements.

11.2 **Replace** the second paragraph by:

They shall have a capacity not less than that of the corresponding terminals for the supply conductors.

Add:
See Annex ZC for A-deviations.

11.3 **Replace** at the beginning of the paragraph the words "Switches" by "Surface-type switches".

12 Terminals

12.1 **Replace** in the 3rd paragraph the reference "15" by "15.1".

12.2.1 Replace in table 2 the value "40" by "45".

12.2.4 **Replace** the second paragraph by:

Terminals the body of which is made of materials as detailed in 22.5, are considered as complying with this requirement.

12.2.5 **Replace** the text of this subclause by:

Screw-type terminals shall be so designed that they clamp the conductor(s) without undue damage to the conductor(s).

Compliance is checked by the following test:

The terminal is fitted with rigid (solid or stranded) conductor(s) according to table 2, firstly with conductors having the smallest cross-sectional area, secondly with conductors having the largest cross-sectional area, in the apparatus shown in figure 3; the clamping screws or nuts are tightened with a torque according to table 5.

The length of the test conductor shall be 75 mm longer than the height (H) specified in table 5A.

The end of one conductor shall be passed through an appropriate sized bushing in a platen positioned at a height (H) below the equipment as given in table 5A. The bushing is positioned in a horizontal plane such that the centre line describes a circle of 75 mm diameter, concentric with the centre of the clamping unit in the horizontal plane; the platen is then rotated at a rate of (10 ± 2) rev/min.

The distance between the mouth of the clamping unit and the upper surface of the bushing shall be within ±15 mm of the height indicated in table 5A. The bushing shall be lubricated to prevent binding, twisting or rotation of the insulated conductor.

A mass, as specified in table 5A, is suspended from the end of the conductor. The duration of the test shall be 15 min.

During the test, the conductor shall neither slip out of the clamping unit nor break near the clamping unit, nor shall the conductor be damaged in such a way as to render it unfit for further use.

Table 5A

Conductor cross-section mm^2	Diameter of bushing hole 2) mm	Height 1) H mm	Mass for conductor kg
0,5	6,5	260	0,3
0,75	6,5	260	0,4
1,0	6,5	260	0,4
1,5	6,5	260	0,4
2,5	9,5	280	0,7
4,0	9,5	280	0,9
6,0	9,5	280	1,4
10,0	9,5	280	2,0
16,0	13,0	300	2,9
25,0	13,0	300	4,5
35,0	14,5	320	6,8

1) Tolerance for height H ± 15 mm.

2) If the bushing hole diameter is not large enough to accommodate the conductor without binding, a bushing having the next largest hole size may be used.

12.2.6 **Replace** in the last paragraph the words "in case where they exist in the relevant IEC standard" by "if any, according to CENELEC HD 21.3,"

Replace the Note by:
See Annex ZB for special national conditions.

12.3.1 **Number** the present note as Note 1, and **add** the following note 2:

NOTE 2 - The tests of 12.3.12 are only carried out by using rigid solid conductors.

12.3.2 **Replace** table 6 by:

Table 6

Rated current A	Conductors		
	Nominal cross-sectional areas mm^2	Diameter of largest rigid conductor mm	Diameter of largest flexible conductor mm
Up to and including 4	0,75-1	1,19	-
Above 4 and including 6	1-1,5	1,45	1,73
Above 6 and including 16*	1,5-2,5	2,13	2,21

* Each supply terminal of switches other than those of pattern numbers 3, 03, and 7, shall allow the connection of two 2,5 mm^2 conductors. In such case a terminal for rated current 10 A with separate independent clamping means for each conductor shall be used.

12.3.11 **Replace** table 7 by:

Table 7

Rated current A	Test current A	Cross-sectional area of the conductor mm^2
Up to and including 4	9	0,75
Above 4 and including 6	13,5	1
Above 6 and including 10	17,5	1,5
Above 10 and including 16	22	2,5

For switches having rated currents different from the preferred ones, the test current is determined by interpolation between the next lower and higher preferred rated currents and the cross-sectional area of the conductor is chosen equal to the one specified for the next higher preferred rated current.

12.3.12 **Replace** table 8 by:

Table 8

Rated current of the switch A	cross-sectional area of the test conductor mm^2	
	1st test sequence	2nd test sequence
Up to and including 6	1,0 *	1,5
Above 6 and up to and including 16	1,5	2,5

* Only for countries allowing the use of 1,0 mm^2 conductors in fixed installations

13 Constructional requirements

13.12 **Replace** in the first column of table 11 "40" by "40-45".

Replace in the note of table 11 "IEC 227 and IEC 245" by "HD 21 and HD 22"

13.15.2 **Replace** the note by:
See Annex ZB for special national conditions.

15 Resistance to ageing, to harmful ingress of water and to humidity

15.1 **Replace** in the 9th paragraph the value "55%" by "75%".

15.2.1 **Add** after the last paragraph:

During the test, the drain hole, if any, of switches with IP higher than IPX4 shall not be opened.

15.2.2 **Replace** this subclause by:

Switches with a degree of protection IPX4 are tested according to EN 60529.

15.2.3 **Replace** this subclause by:

Switches with a degree of protection IPX5 are tested according to EN 60529.

Add the following new sub-clause:

15.2.4 During the test of 15.2.2 or 15.2.3 care shall be taken not to disturb the switch, for instance with shocks or jerks, to such an extent the results of the test are modified.

If the accessory is provided with a drain hole, inspection shall show that water having entered the specimen does not accumulate and drip off without further damage to the whole equipment.

NOTE 1 - For a degree of protection higher than IPX4, it may be necessary to open the drain hole for inspection.

NOTE 2 - If the accessory is not provided with drain holes, consideration should be given to the dispersal of any accumulation of water which may occur.

Immediately after the test of 15.2.2 or 15.2.3 the specimens shall withstand the electric strength test as specified in 16.2. This test shall begin within 5 min after completion of the test of 15.2.2 or 15.2.3.

17 Temperature rise

Add the following row to table 14 between the values given for rated currents "40" and "63"

45	51	16

19 Normal operation

19.1 **Replace** in table 16 the value "40" by "45".

Replace in the 15th paragraph after table 16 the words "Length 0,3 m ± 0,015 m" by " length of at least 1 m".

19.2 **Replace** the 4th paragraph by:

The switches, except for switches of pattern numbers 3 and 03 and momentary contact switches, are tested at rated voltage and rated current in the apparatus and with the connections specified in 18.1.

Add in the last paragraph after the words "in clause 17", the words "using conductors as specified in this subclause, and .....".

22 Screws, current-carrying parts and connections

22.1 **Delete** the second sentence of the second paragraph.

23 Creepage distances, clearances and distances through sealing compound

23.1 **Replace** in table 19, item 2 , the values "4*" by "4 ***** "and in item 7 the value "3" by "3*****"

Replace in table 19, item 9, the value "3" by "2,5".

Add at the bottom of table 19 the following note:

***** Clearances and creepage distances between live parts of different polarity are reduced to 1 mm for the distance between the lead wires in the pinch of a neon indicator lamp with external resistor.

Add the following subclause:

23.3 Ordinary surface-type switches shall not have bare current-carrying strips at the back.

Compliance is checked by inspection.

24 Resistance of insulating material to abnormal heat, to fire and to tracking

24.1.1 **Replace** in the first paragraph a) and b) by:

a) for parts of insulating material necessary to retain current-carrying parts, and parts of the earthing circuit in position, except for parts of insulating materials necessary to hold in position the earthing terminal in an enclosure, by the test made at a temperature of 850 °C;

b) for parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though they are in contact with them, and parts of insulating materials necessary to hold in position the earthing terminal in an enclosure, by the test made at a temperature of 650 °C.

Add the following clause:

26 EMC

26.1 Immunity

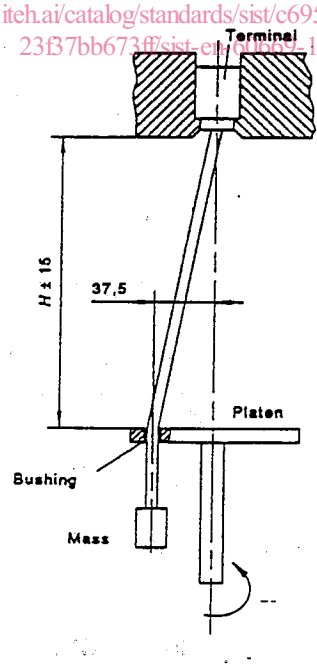
Switches not incorporating electronic components for their operation are not sensitive to electromagnetic disturbances and therefore no immunity tests are necessary.

26.2 Emission

Switches according to this standard do not give rise to intolerable emissions and therefore no emission tests are necessary.

FIGURES

Replace fig. 3 by:



Dimensions in millimetre

Note - Care should be taken that the bushing hole is made in a way which ensures that the force extended to the cable is pure pulling force and that the trasmission of any torque to the connection in the clamping means is avoided

Figure 3 - Arrangement for checking damage to conductors

Annex B

7.1.9 **Add** the following text:

-Where a cord anchorage is intended to clamp effectively flexible cables other than those cross-sectional areas appropriate to the rating of the switch as given in table 2, then the minimum and maximum sizes for which the anchorage is provided may be marked in an area adjacent to the anchorage, e.g. "6 mm - 16 mm" or "6-16". The information shall be put on the switch and/or the packing unit.

13.16 **Replace** in the first paragraph:

"code designation 227 IEC 53" by "code designation 227 IEC 52 or 227 IEC 53".

Replace the last but one paragraph by:

An a.c. voltage of 2000V is applied for 1 min between the conductors and any metal clamp of the cord anchorage".

Add after the last paragraph the following:

For flexible cable outlet switches:
- It shall be clear how the relieve from strain and the prevention of twisting is intended to be effected;
- the cord anchorage, or at least part of it, shall be integral or permanently fixed to one of the component parts of the switch;
- makeshift methods, such as tying the flexible cable in a knot or tying the ends with a string, shall not be used.
- cord anchorages shall be suitable for the different types of flexible cables for which they are intended.

Rewirable switches with earthing connection shall be designed with ample space for slack of the earthing conductor in such a way that, if the strain relief should fail, the connection of the earthing conductor is subjected to strain after the connections of current carrying conductors and that, in the case of excessive stresses, the earthing conductor will break after the current-carrying conductors.

Add the following:

ANNEX C of 669-1

Routine test

(Under consideration).