
**Stikala za gospodinjstva in podobne nepremične električne inštalacije –
Spremljevalni standard – Stikala in pripadajoči pribor za uporabo elektronskih
sistemov doma in v stavbah**

(istoveten EN 50428:2005)

Switches for household and similar fixed electrical installations – Collateral standard
– Switches and related accessories for use in home and building electronic systems
(HBES)

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EUROPEAN STANDARD

EN 50428

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2005

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English version

**Switches for household and similar fixed electrical installations –
Collateral standard –
Switches and related accessories for use
in home and building electronic systems (HBES)**

Interrupteurs pour installations électriques
fixes domestiques et analogues –
Norme collatérale –
Interrupteurs et appareils associés
pour usage dans les systèmes
électroniques des foyers domestiques
et bâtiments (HBES)

Schalter für Haushalt und ähnliche
ortsfeste elektrische Installationen –
Ergänzungsnorm –
Schalter und ähnliches Installations-
material in elektronischer Systemtechnik
für Heim und Gebäude (ESHG)

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This European Standard was approved by CENELEC on 2004-12-07. 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, 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

This European Standard has been prepared by the Technical Committee CENELEC TC 23B: Switches for household and similar fixed electrical installations.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50428 on 2004-12-07.

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) 2006-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2008-01-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 89/336/EEC. See Annex ZZ.

This standard has to be used in conjunction with EN 60669-1 and EN 60669-2-1. It lists the additional changes necessary to convert it into the European Standard: *Switches for household and similar fixed electrical installations - Collateral standard - Switches and related accessories for use in home and building electronic systems (HBES)*

When this standard states "addition", "modification" or "replacement", the relevant text of EN 60669-1 or EN 60669-2-1 (hereinafter called Part 1 and Part 2-1 respectively) is to be adapted accordingly.

NOTE The following numbering system is used: [SIST EN 50428:2006](#)

- subclauses, tables and figures that are numbered starting from 201 are additional to those in Part 2-1;
- additional annexes to Part 1 are lettered AA, BB, etc. [EN 50428-7152/sist-en-50428-2006](#)

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1 Scope

This clause of Part 2-1 is replaced by the following:

This collateral standard applies to HBES switches with a working voltage not exceeding 250 V a.c. and a rated current up to and including 16 A. for household and similar fixed electrical installations either indoors or outdoors and to associated electronic extension units.

It applies

- to HBES switches for the operation of lamp circuits and the control of the brightness of lamps (dimmers) as well as the control of the speed of motors (e.g. those used in ventilating fans) and for other purposes (e.g. heating installations),
- to sensors, actuators, switched-socket-outlets, associated electronic extension units, etc

In the following document the word " HBES switch " is applied to describe all kind of HBES devices e.g. switches, sensors, actuators, switched-socket-outlets, associated electronic extension units, etc.

The operation and control are performed

- intentionally by a person via an actuating member, a key, a card, etc., via a sensing surface or a sensing unit, by means of touch, proximity, turn, optical, acoustic, thermal,
- by physical means, e.g. light, temperature, humidity, time, wind velocity, presence of people,
- by any other influence;

and transmitted

- by an electronic signal via several media, e.g. powerline -(mains), twisted pair, optical fibre, radio frequency, infra-red, etc.:

HBES Switches complying with this standard are suitable for use at ambient temperatures not normally exceeding 25 °C, but occasionally reaching 35 °C.

There is no need for functional safety requirements in this standard. Functional safety requirements shall be covered by the standards of the devices which are controlled by the HBES.

In locations where special conditions prevail, such as higher temperature special constructions may be required.

NOTE 1 This annex is not intended to cover devices falling within the scope of IEC 60730.

NOTE 2 Electronic switches without a mechanical switch in the main circuit do not provide a "full off-state". Therefore, the circuit on the load side should be considered to be live.

NOTE 3 HBES-switches to be connected to telecommunication networks should fulfil the relevant standard.

2 Normative references

Annex ZA of Part 2-1 is applicable with the following additions:

EN 50065-1, Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 1: General requirements, frequency bands and electromagnetic disturbances

EN 50065-2-1, Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz -- Part 2-1: Immunity requirements for mains communications equipment and systems operating in the range of frequencies 95 kHz to 148,5 kHz and intended for use in residential, commercial and light industrial environments

EN 50065-2-3, Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz -- Part 2-3: Immunity requirements for mains communications equipment and systems operating in the range of frequencies 3 kHz to 95 kHz and intended for use by electricity suppliers and distributors

EN 50090-2-2 Home and building electronic systems (HBES) – Part 2-2: System overview – General technical requirements

EN 55022:1994, Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (CISPR 22:1993)

EN 60664-1:2003, Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests (IEC 60664-1:1992 + A1:2000 + A2:2002)

EN 60669-1, Switches for household and similar fixed-electrical installations – Part 1: General requirements (IEC 60669-1)

EN 60669-2-1, Switches for household and similar fixed electrical installations – Part 2-1: Particular requirements - Electronic switches (IEC 60669-2-1)

EN 61140:2002, Protection against electric shock - Common aspects for installation and equipment (IEC 61140:2001)

EN 61558-2-6, Safety of power transformers, power supply units and similar -- Part 2-6: Particular requirements for safety isolating transformers for general use (IEC 61558-2-6)

ETSI EN 300 220-1, Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW – Part 1: Technical characteristics and test methods

ETSI EN 300 220-3, Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW – Part 3: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

ETSI EN 301 489-3, Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services – Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz

HD 384.4.41 S2:1996, Electrical installations of buildings – Part 4: Protection for safety – Chapter 41: Protection against electric shock (IEC 60364-4-41:1992, modified)

3 Definitions

This clause of Part 2-1 is applicable with the following additions:

3.201

HBES switch

device using two way communication designed to make or break and/or to control, directly (e.g. actuator) or indirectly (e.g. sensor), the current in one or more electric circuits. The communication can use different media e.g. Twisted Pair (TP), Power Line (PL), Infra Red (IR) and Radio Frequency (RF)

NOTE To make or break and/or to control directly means that an actuator makes or breaks the current and/or controls the current.

3.202

ELV

for the purpose of this standard, a voltage not exceeding 50 V a.c. or d.c. between conductors, or in the case of three-phase circuits, not exceeding 29 V between conductors and neutral, the no-load voltage of the circuit not exceeding 50 V and 29 V, respectively

NOTE The use of ELV other than for protection by SELV or PELV in such circuits is not a protective measure.

3.203

SELV system

an electrical system in which the voltage cannot exceed ELV

- under normal conditions
- under single fault conditions, including earth faults in other circuits

3.204**PELV system**

an electrical system in which the voltage cannot exceed ELV

- under normal conditions
- under single fault conditions, except earth faults in other circuits

3.205**simple separation**

separation between circuits or between a circuit and earth by means of basic insulation

3.206**protective separation**

separation of one electric circuit from another by means of

- double insulation, or
- basic insulation and protective screening, or
- reinforced insulation

3.207**basic insulation**

insulation of hazardous-live-parts which provides basic protection

NOTE This concept does not apply to insulation used exclusively for functional purposes. [IEV 195-06-06].

3.208**supplementary insulation**

independent insulation applied in addition to basic insulation, for fault protection [IEV 195-06-07]

3.209**double insulation**

insulation comprising both basic insulation and supplementary insulation [IEV 195-06-08]

3.210**reinforced insulation**

insulation of hazardous-live-parts which provides a degree of protection against electric shock equivalent to double insulation

NOTE Reinforced insulation may comprise several layers which cannot be tested singly as basic insulation or supplementary insulation [IEV 195-06-09]

4 General requirements

This clause of Part 2-1 is applicable.

5 General notes on tests

This clause of Part 2-1 is applicable.

6 Ratings

This clause of Part 2-1 is applicable except as follows.

Addition:

The ELV is limited to 50 V a.c. and 50 V d.c.

NOTE For three phase circuits see 3.202.

7 Classification

This clause of Part 2-1 is applicable except as follows.

Replacement of 7.1.5 of Part 2-1 by:

7.1.5 *Addition:*

- touch;
- proximity;
- optical;
- acoustic;
- other external influences e.g. communication system.

NOTE Actuating the electronic switch includes on/off operation, and/or regulating the brightness of lamps or speed of motors.

Replacement of 7.1.8 of Part 1 by:

7.1.8 according to the wiring connection:

- switches with screw-type terminals;
- switches with screwless terminals for rigid conductors only;
- switches with screwless terminals for rigid and flexible conductors;
- switches without terminals equipped with connecting leads.

Addition:

7.1.201 according to the presence of SELV or PELV part:

- switches with SELV or PELV parts only;
- switches without SELV or PELV parts;
- switches having a combination of parts connected to the mains and SELV or PELV parts.

8 Marking

This clause of Part 2-1 is applicable.

9 Checking of dimensions

This clause of Part 2-1 is applicable.

10 Protection against electric shock

This clause of Part 2-1 is applicable except as follows.

Addition:

10.201 Live parts of SELV or PELV circuits shall be electrically separated from each other and from other circuits by simple or protective separation as given in Clause 23.

SELV / PELV is 50 V a.c. or d.c. max under no fault and one single fault condition.

In addition, if the SELV / PELV is higher than 25 V a.c protection against direct contact shall be provided by:

- barriers or enclosures giving at least the degree of protection IP2X or IPXXB or
- insulation capable of withstanding a test voltage of 500 V a.c. for 1 min (see HD 384.4.41 S2 Subclause 411.1.4.3).

In wet conditions the value is reduced to 6 V a.c. or 15 V d.c. (ripple free).

Compliance is checked by the requirements and the tests of Clauses 16 and 23.

11 Provision for earthing

This clause of Part 2-1 is applicable.

12 Terminals

This clause of Part 1 is applicable except as follows.

12.1 Addition after the 1st paragraph:

The connecting capability of terminals for circuits other than those of the main circuit needs not to be in relation with the rated current of the HBES switch. This means that these terminals need not necessarily to have the same connecting capability as the mains terminals of the HBES switch. Terminals for conductors lower than 0,5 mm² shall fulfil the requirements of EN 60998-1.

13 Constructional requirements

This clause of Part 2-1 is applicable except as follows.

Modification of Table 11 of Subclause 13.3.2 of Part 1:

Table 11 – Forces to be applied to covers, cover-plates or actuating members whose fixing is not dependent on screws

Accessibility with the test finger after removal of covers, cover plates or parts of them	Test according to	Force to be applied			
		Switches complying with 20.7 and 20.8		Switches not complying with 20.7 and 20.8	
		Shall not come off	Shall come off	Shall not come off	Shall come off
To live parts	20.4	40	120	80	120
To non-earthed metal parts separated from live parts by creepage distances according to Table 20	20.5	10	120	20	120
To insulating parts, earthed metal parts, the live parts of SELV or metal parts separated from live parts by creepage distances and by clearances twice those according to Table 20	20.6	10	120	10	120

14 Mechanism

This clause of Part 2-1 is applicable.

15 Resistance to ageing, protection provided by enclosures of switches, and resistance to humidity

This clause of Part 2-1 is applicable.

16 Insulation resistance and electric strength

This clause of Part 2-1 is applicable except as follows.

Addition to Table 14:

Table 14 – Test voltage, points of application and minimum values of insulating resistance for the verification of dielectric strength

9	Between main supply circuits and SELV and PELV circuits			3 750
10	Between a SELV or PELV circuit below 25 V a.c. and a SELV or PELV circuit above 25 V a.c.		500	500
11	Between a SELV or PELV circuit above 25 V a.c and accessible surfaces (see Clause 10)		500	500
12	Between a SELV and PELV circuits		500	500

Only items 9, 10, 11 and 12 are applicable to SELV or PELV parts of HBES switches.

NOTE Items 1 to 8 are not applicable to SELV or PELV parts of HBES switches

17 Temperature rise

This clause of Part 2-1 is applicable.

NOTE HBES switches having no load switching means are not subjected to this test.

18 Making and breaking capacity

This clause of Part 2-1 is applicable.

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19 Normal operation

This clause of Part 2-1 is applicable.

20 Mechanical strength

This clause of Part 2-1 is applicable.

21 Resistance to heat

This clause of Part 2-1 is applicable.

22 Screws, current-carrying parts and connections

This clause of Part 2-1 is applicable.

23 Creepage distances, clearances and distances through sealing compound

This clause of Part 2-1 is applicable except as follows.

Addition:

This standard is only intended to give requirements for insulation between different electrical parts to verify insulation conditions between SELV/PELV and other circuits.