IEC 60669-1

Edition 4.0 2017-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

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

Interrupteurs pour installations électriques fixes domestiques et analogues – Partie 1: Exigences générales

IEC 60669-1:2017-02(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SWITCHES FOR HOUSEHOLD AND SIMILAR FIXED ELECTRICAL INSTALLATIONS –

Part 1: General requirements

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60669-1 has been prepared by subcommittee 23B: Plugs, socket-outlets and switches, of IEC technical committee 23:

This fourth edition cancels and replaces the third edition published in 1998, Amendment 1:1999 and Amendment 2:2006. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) change of the scope for motor load switches;
b) deletion of some dated normative references;
c) changes to the definitions;
d) in Clause 5 the number of specimens to be used for the tests are clearly given in Table 1 (Corresponding Annex A of IEC 60669-1:1998 was therefore deleted);
e) in Clause 5 it was clarified on which switches the tests of Clause 19 shall be carried out;

f) requirements concerning 13 A switches have been included;

g) mandatory indication that a terminal is suitable for rigid conductor only;

h) requirements and test conditions for flexible conductors have been included in Clause 12;

i) requirements for pilot light units have been included;

j) new test for self-ballasted lamp loads in 19.3;

k) Table 20 has been completely redrawn to cover normal, mini and micro-gap switches and renumbered Table 23;

l) new informative Annex B including changes planned for the future in order to align IEC 60669-1 with the requirements of IEC 60998 (all parts), IEC 60999 (all parts) and IEC 60228;

m) new informative Annex C about the circuit development for 19.3;

n) new informative Annex D including additional requirements for insulation-piercing terminals;

o) new informative Annex E including additional requirements and tests for switches intended to be used at a temperature lower than −5 °C.

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

FDIS	Report on voting
23B/1235/FDIS	23B/1241/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

In this standard, the following print types are used:

- *compliance statements: in italic type*

A list of all parts in the IEC 60669 series, published under the general title *Switches for household and similar fixed electrical installations*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

The contents of the corrigendum of January 2020 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

SWITCHES FOR HOUSEHOLD AND SIMILAR FIXED ELECTRICAL INSTALLATIONS –

Part 1: General requirements

1 Scope

This part of IEC 60669 applies to manually operated general purpose functional switches, for alternating current (AC) only with a rated voltage not exceeding 440 V with a rated current not exceeding 63 A, intended for household and similar fixed electrical installations, either indoors or outdoors.

For switches provided with screwless terminals, the rated current is limited to 16 A.

NOTE 1 The rated current is limited to 16 A for switches provided with insulation piercing terminals (IPT's) according to Annex D.

Switches covered by this document are, where applicable, intended for the control in normal use of all of the following loads:

– a circuit for a tungsten filament lamp load;
– a circuit for an externally ballasted lamp load (for example LED, CFL, fluorescent lamp load);
– a circuit for a self ballasted lamp load (for example LEDi or CFLi);
– a circuit for a substantially resistive load with a power factor not less than 0,95;
– a single phase circuit for motor load with a rated current not exceeding 3 A at 250 V (750 VA) and 4,5 A at 120 V (540 VA) and a power factor not less than 0,6. This applies to both switches rated not less than 10 A that have not undergone additional tests and to momentary switches rated not less than 6 A that have not undergone additional tests.

NOTE 2 In the following country the suitability of a switch intended to control the inrush current of a motor shall be tested: AU.

This document also applies to boxes for switches, with the exception of mounting boxes for flush-type switches.

NOTE 3 General requirements for boxes for flush-type switches are given in IEC 60670-1.

It also applies to switches such as

– switches incorporating pilot lights;
– electromagnetic remote control switches (particular requirements are given in IEC 60669-2-2);
– switches incorporating a time-delay device (particular requirements are given in IEC 60669-2-3);
– combinations of switches and other functions (with the exception of switches combined with fuses);
– electronic switches (particular requirements are given in IEC 60669-2-1);
– switches having facilities for the outlet and retention of flexible cables (see Annex A);
– isolating switches (particular requirements are given in IEC 60669-2-4);
– switches and related accessories for use in home and building electronic systems (particular requirements are given in IEC 60669-2-5);
– firemen's switches (particular requirements are given in IEC 60669-2-6).

Switches complying with this document are suitable for use at ambient temperatures not normally exceeding +40 °C, but their average over a period of 24 h does not exceed +35 °C, with a lower limit of the ambient air temperature of –5 °C.

NOTE 4 For lower temperatures see Annex E.

Switches complying with this document are suitable only for incorporation in equipment in such a way and in such a place that it is unlikely that the surrounding ambient temperature exceeds +35 °C.

In locations where special conditions prevail, such as in ships, vehicles and the like and in hazardous locations, for example where explosions are liable to occur, special construction and/or additional requirements may be required.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60038:2009, *IEC standard voltages*

IEC 60068-2-75:2014, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60112:2009, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60212:2010, *Standard conditions for use prior to and during the testing of solid electrical insulation materials*

IEC 60227-5:2011, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 5: Flexible cables (cords)*

IEC 60228:2004, *Conductors of insulated cables*

IEC 60245-4:2011, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 4: Cords and flexible cables*

IEC 60417, *Graphical symbols for use on equipment* (available from: http://www.graphical-symbols.info/equipment)

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60669-2-1:2002, *Switches for household and similar fixed electrical installations – Part 2-1: Particular requirements – Electronic switches*
IEC 60669-2-1:2002/AMD1:2008
IEC 60669-2-1:2002/AMD2:2015

IEC 60695-2-10:2000, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 60695-2-11:2014, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60998-1:2002, *Connecting devices for low-voltage circuits for household and similar purposes – Part 1: General requirements*

IEC 60998-2-1, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units*

IEC 60998-2-2, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units*

IEC 60998-2-3, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units*

IEC 60998-2-4, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-4: Particular requirements for twist-on connecting devices*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

ISO 1456:2009, *Metallic and other inorganic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 2081:2008, *Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2093:1986, *Electroplated coatings of tin – Specification and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

NOTE Where the terms "voltage" and "current" are used, they are rms values unless otherwise specified.

3.1
switch
device designed to make or break the current in one or more electric circuits

3.1.1
on/off switch
switch for alternatively closing and opening one or more electric circuits.

[SOURCE: IEC 60050-151:2001, 151-12-23]

3.1.2
momentary contact switch
switch which returns its contacts automatically to the initial state after operation.

Note 1 to entry: Momentary contact switches are intended to operate, for example, bells, electromagnetic remote control switches, time-delay switches and electronic switches.

3.1.3
push-button switch
switch having a single actuator which moves with a single motion when operated by an external, manual force usually applied by the finger or palm of the hand and having stored energy return

3.1.4
cord-operated switch
switch the operating means of which is a cord which has to be pulled in order to change its contact state

3.1.5
switch of normal-gap construction
switch construction having a clearance between the contacts in the open position of not less than 3 mm

3.1.6
switch of mini-gap construction
switch construction having a clearance between the contacts which is less than 3 mm but is not less than 1,2 mm

3.1.7
switch of micro-gap construction
switch construction having a clearance between the contacts in the open position of less than 1,2 mm

3.2
one operation
transfer of the moving contacts from one operating position to another

3.3
terminal
conductive part of one pole, composed of one or more clamping unit(s) and insulation if necessary

3.4
clamping unit
part or parts of a terminal necessary for the mechanical clamping and the electrical connection of the conductor(s)

3.5
screw-type terminal
terminal intended for the connection, by clamping only, of (an) external rigid or flexible conductor(s)

3.5.1
pillar terminal
screw-type terminal in which the conductor(s) is (are) inserted into a hole or cavity, where it is clamped under the shank of the screw or screws

Note 1 to entry: The clamping pressure can be applied directly by the shank of the screw or through an intermediate clamping part to which pressure is applied by the shank of the screw.

Note 2 to entry: Examples of pillar terminals are shown in Figure 1.

[SOURCE: IEC 60050-442:1998, 442-06-22, modified — “or screws” has been added because in some constructions there is more than one screw.]

3.5.2
screw head terminal
screw-type terminal in which the conductor is clamped under the head of the screw

Note 1 to entry: The clamping pressure can be applied directly by the head of the screw or through an intermediate part, such as a washer, clamping plate or anti-spread device.

Note 2 to entry: Examples of screw head terminals are shown in Figure 2.

3.5.3
stud terminal
screw-type terminal in which the conductor is clamped under a nut

Note 1 to entry: The clamping pressure can be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, a clamping plate or an anti-spread device.

Note 2 to entry: Examples of stud terminals are shown in Figure 2.

[SOURCE: IEC 60050-442:1998, 442-06-23]

3.5.4
saddle terminal
screw-type terminal in which the conductor is clamped under a saddle by means of two or more screws or nuts

Note 1 to entry: Examples of saddle terminals are shown in Figure 3.

[SOURCE: IEC 60050-442:1998, 442-06-09, modified — "screw-type" has been added.]

3.5.5
lug terminal

screw head terminal or stud terminal, designed for clamping a cable lug or bar by means of a screw or nut

Note 1 to entry: Examples of lug terminals are shown in Figure 4.

[SOURCE: IEC 60050-442:1998, 442-06-16, modified — "screw-type terminal" is replaced with "screw head terminal or stud terminal" and “directly and indirectly” has been deleted.]

3.5.6
mantle terminal
screw-type terminal in which the conductor is clamped against the base of a slot in a threaded stud by means of a nut

Note 1 to entry: The conductor is clamped against the base of the slot by a suitably shaped washer under the nut, by a central peg if the nut is a cap nut, or by equally effective means for transmitting the pressure from the nut to the conductor within the slot.

Note 2 to entry: Examples of mantle terminals are shown in Figure 5.

[SOURCE: IEC 60050-442:1998, 442-06-14, modified — “screw-type” has been added and the last part of the definition is included in a note.]

3.6
screwless-type terminal
terminal for the connection and subsequent disconnection of a rigid (solid or stranded) or flexible conductor or the interconnection of two conductors capable of being dismantled, the connection being made, directly or indirectly, by means of springs, parts of angled, eccentric or conical form, etc., without special preparation of the conductor concerned, other than removal of insulation

[SOURCE: IEC 60050-442:1998, 442-06-11 , modified]