

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

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

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

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FOREWORD

This amendment has been prepared by subcommittee 23B: Plugs, socket-outlets and switches, of IEC technical committee 23: Electrical accessories.

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

FDIS	Report on voting
23B/894/FDIS	23B/907/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
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- replaced by a revised edition, or
- amended.

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1 Scope

Replace the beginning of the third paragraph of the Replacement by the following:

The operation and/or control as mentioned...

Replace the fourth paragraph of the Replacement by the following:

This standard also applies to general purpose electronic switches with included automatic functions where the operation and/or the control is initiated by a change of a physical quantity, for example light, temperature, humidity, time, wind velocity, presence of persons, etc.

Add the following after the fifth paragraph of the Replacement:

This standard also applies to electronic RCS and electronic TDS with a rated voltage not exceeding 440 V and a rated current not exceeding 25 A, intended for household and similar fixed electrical installations, either indoors or outdoors.

NOTE 1 Switches including only passive components such as resistors, capacitors, inductors, PTC and NTC components, varistors, printed wiring boards and connectors are not considered as electronic switches.

NOTE 2 Electronic switches may have control circuits with a.c. or d.c. rated control voltages.

Renumber NOTES 1 and 2 as NOTES 3 and 4.

2 Normative references

Add the following standards to the existing list:

IEC 60317 (all parts), *Specifications for particular types of winding wires*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60669-2-2:2006, *Switches for household and similar fixed electrical installations – Part 2-2: Particular requirements - Electromagnetic remote-control switches (RCS)*

IEC 60669-2-3:2006, *Switches for household and similar fixed electrical installations – Part 2-3: Particular requirements - Time-delay switches (TDS)*

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 61558-2-6, *Safety of power transformers, power supply units and similar – Part 2: Particular requirements for safety isolating transformers for general use*

[IEC 60669-2-1:2002/AMD1:2008](https://standards.iteh.ai/catalog/standards/sist/c547b142-a4f1-4d0b-a3fd-46fe5550b2e9/iec-60669-2-1-2002-amd1-2008)

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3 Definitions

Add, on page 17, the following new definitions:

3.112

RCS

remote controlled switch

switch intended to be operated from a distance

3.112.1

electromagnetic RCS

RCS provided with a coil which is operated by means of impulses or which may be permanently energized by means of a control circuit

NOTE These devices are covered by IEC 60669-2-2.

3.112.2

electronic RCS

electronic switch providing the function, markings and connection configuration of an RCS according to IEC 60669-2-2, but containing electronic components and/or a combination of electronic components and a coil or coils, which is operated by means of an electronic extension unit or units

NOTE This electronic RCS may for example be used as a look alike replacement for RCS according to IEC 60669-2-2.

3.113**rated control voltage**

the voltage assigned to the external control circuit by the manufacturer

3.114**switching circuit**

the circuit which contains the parts which allow the rated current to flow through the RCS or TDS

3.115**control circuit**

the circuit which includes electrical parts to actuate the switching mechanism

3.116**control mechanism**

mechanism which includes all the parts which are intended for the operation of the RCS or TDS

3.117**incorporated hand-operated device**

device incorporated in the switch which allows the switching circuit to be operated, directly or indirectly. This device is not intended for the normal operation of the RCS or TDS

3.118**rated control current**

current required for the initiation of the electronic RCS assigned to the control circuit by the manufacturer

3.119**bistable electronic RCS**

electronic RCS containing a control mechanism which, when not initiated electrically or actuated mechanically, remains stable in its operating position and will change its operating position on initiation or actuation

3.120**monostable electronic RCS**

electronic RCS containing a control mechanism which, on electrical initiation or mechanical actuation, changes the operating position of the switch which remains in this condition while the electronic RCS is initiated or actuated, and returns to the position prior to initiation or actuation of the electronic RCS after initiation or actuation is discontinued

3.121**priority electronic RCS**

electronic RCS used to operate directly or indirectly a first load circuit or group of load circuits the use of which at times can be dispensed with, and where the control circuit of the electronic RCS is influenced by or connected to a second circuit or group of circuits (priority or circuits) which when energized will thus initiate the control circuit of the electronic RCS to de-energize the first load circuit or circuits for the time during which the second circuit or group of circuits is energized

NOTE The electronic RCS may have a means for adjusting the sensitivity of the electronic RCS control circuit to initiate the electronic RCS depending on the total load or current delivered to any part of the circuits (priority switch with current coil) or be sensitive to the voltage (priority switch with voltage coil) applied to the second load or group of loads.

3.122**TDS****time delayed switch**

switch provided with a time-delay device which operates for a certain time (the delay time). It may be either manually actuated and/or remotely electrically initiated

3.123**electronic TDS**

electronic switch providing the function, markings and connection configuration of a TDS according to IEC 60669-2-3, but containing electronic components

NOTE This electronic TDS may for example be used as a look alike replacement for TDS according to IEC 60669-2-3.

3.124**delay time**

period during which the switching circuit(s) is (are) kept closed. Any time taken for the decreasing of the voltage (e.g. to reduce the light) at the end of the delay period is included within the delay time

3.125**delay device**

all components which have an influence on the delay time. The delay time may be adjustable

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5 General notes on tests

<https://standards.iteh.ai/catalog/standards/sist/c547b142-a4f1-4d0b-a3fd-40c550b2c97c/iec-60669-2-1-2002-amd1-2008>

5.4 *Replace Table 101 by the following new Table 101:***Table 101 – Number of specimens**

Type of electronic switch	Number for general tests	Additional specimens for clause or subclause					
		18.2	19.101	19.102	24	26	101 and 102
Marked with one rated current and							
– one rated voltage	3	3 ^a	3 ^a	3 ^a	3	3	3 ^c
– two rated voltages	6	6 ^a	6 ^a	6 ^a	6	6	6 ^{b,c}
^a Only for electronic switches with mechanical and electromechanical switching devices; only the complete contact mechanism may be submitted. ^b It may be necessary to provide three additional specimens for the test of 101.3. ^c When the tests of Clause 26 have been passed successfully, the specimens can be used for these tests.							

On page 19, add the following new subclauses:

5.105 If an electronic RCS or electronic TDS is provided with an incorporated hand-operated device, it shall be tested as specified in Clause 19.

NOTE 1 During the making and breaking capacity tests and the normal operation tests, switching at the same phase angle should be avoided, as this may give misleading results.

NOTE 2 Precautions should be taken when using combinations equipped with synchronous motors and similar operating devices.

5.106 In the case of an electronic TDS for which the control and the switching circuits have no common point, the test is made with the circuits supplied with the rated voltages which are declared by the manufacturer.

6 Rating

Add the following new Addition:

Addition:

For electronic RCS, Clause 6 of IEC 60669-2-2 is applicable.

For electronic TDS, Clause 6 of IEC 60669-2-3 is applicable.

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7 Classification

7.1.1 *Add the following new Addition:*

[IEC 60669-2-1:2002/AMD1:2008](https://standards.iteh.ai/catalog/standards/sist/c547b142-a4f1-4d0b-a3fd-46fe5550b2e9/iec-60669-2-1-2002-amd1-2008)

Addition:

<https://standards.iteh.ai/catalog/standards/sist/c547b142-a4f1-4d0b-a3fd-46fe5550b2e9/iec-60669-2-1-2002-amd1-2008>

For electronic TDS, Subclause 7.1.1 of IEC 60669-2-3 applies.

7.1.5 *Add the following new Addition:*

Addition:

For electronic RCS, Subclause 7.1.5 of IEC 60669-2-2 is applicable.

For electronic TDS, Subclause 7.1.5 of IEC 60669-2-3 is applicable.

On page 21, add the following new subclauses:

7.101 For electronic RCS, Subclause 7.101 of IEC 60669-2-2 is applicable.

7.102 For electronic RCS, Subclause 7.102 of IEC 60669-2-2 is applicable.

7.103 Electronic RCS or electronic TDS having a SELV- or PELV-circuit.

8 Marking

8.1 *On page 23, add after the last paragraph the following new paragraph:*

For general purpose electronic switches with included automatic function the number of operations shall be stated in the accompanying instruction sheet when the manufacturer declares the number of operations is higher than indicated in Subclauses 19.101, 19.102 and 19.104.

In addition,

- for electronic RCS, Subclause 8.1 of IEC 60669-2-2 applies;
- for electronic TDS, Subclause 8.1 of IEC 60669-2-3 applies.

8.2 *Add the following new paragraph:*

In addition,

- for electronic RCS, Subclause 8.2 of IEC 60669-2-2 applies;
- for electronic TDS, Subclause 8.2 of IEC 60669-2-3 applies.

8.3 *Replace the first dashed text by the following:*

- the rated current or rated load, rated voltage, symbol for nature of supply, rated frequency (if required by 8.1), at least one type of load, the rating and type of any incorporated fuse (this shall be marked on the fuse-holder or in the proximity of the fuse),

[IEC 60669-2-1:2002/AMD1:2008](https://standards.iteh.ai/catalog/standards/sist/c547b142-a4f1-4d0b-a3fd-46fe5550b2e9/iec-60669-2-1-2002-amd1-2008)

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8.4 *Add the following new paragraph:*

In addition,

- for electronic RCS, Subclause 8.4 of IEC 60669-2-2 applies;
- for electronic TDS, Subclause 8.4 of IEC 60669-2-3 applies.

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10 Protection against electric shock

10.1 *Renumber the first note as “NOTE 1”.*

Replace the second note by the following:

NOTE 2 For the purposes of this standard, parts connected to a supply operating at SELV with a voltage up to and including 25 V a.c. or 60 V d.c. ripple free are not considered to be hazardous live parts.

Page 31

12 Terminals

12.1 Add the following new Additions:

Addition after the 3rd paragraph:

Terminals having screw clamping which are in compliance with IEC 60998-2-1 can be used.

Addition after the last paragraph:

Terminals having screw clamping complying with IEC 60998-2-1 are considered to be in compliance with the requirements and tests of Subclause 12.2, except those of 12.2.6 and 12.2.7 and 12.2.8, provided they are chosen according to Table 2.

12.2 Add the following new Addition:

Addition to note 2 of Table 2:

This requirement may be achieved using terminal(s) with two separate clamping units.

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13 Constructional requirements

<https://standards.iteh.ai/catalog/standards/sist/c547b142-a4f1-4d0b-a3fd-46fe5550b2e9/iec-60669-2-1-2002-amd1-2008>

Replace Subclause 13.5 by the following:

13.5 Replacement:

Knobs of electronic switches shall be securely fixed in a reliable manner so that they will not work loose in normal use, if loosening may result in a hazard.

If knobs are used to indicate the position of electronic switches, it shall not be possible to fix them in a wrong position, if this may result in a hazard.

Compliance is checked by inspection and by the following tests.

Where it is possible to apply an axial pull in normal use, an axial pull shall be applied for 1 min to try to pull off the knob.

The pull force to be applied is normally 15 N, but if the knob is intended to be pulled in normal use this is increased to 30 N.

An axial push of 30 N for 1 min is then applied to all knobs.

During and after these tests, the electronic switch shall show no damage, nor shall a knob have moved so as to impair compliance with this standard.

NOTE Sealing compound and the like, other than self-hardening resins are not considered to be adequate to prevent loosening.

13.15.1 Replace the 5th paragraph by the following:

The electronic switches are then placed for 2 h in a heating cabinet as described in 15.1, the temperature being maintained at (40 ± 2) °C.

13.103 Replace this subclause by the following new subclause:

13.103 For electronic TDS, Subclause 13.101 of IEC 60669-2-3 applies.

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14 Mechanism

Add the following new subclause:

14.101 For electronic RCS, Subclause 14.101 of IEC 60669-2-2 applies.

For electronic TDS, Subclause 14.101 of IEC 60669-2-3 applies.

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16 Insulation resistance and electric strength

Add the following: <https://standards.iteh.ai/catalog/standards/sist/c547b142-a4f1-4d0b-a3fd-46fe5550b2e9/iec-60669-2-1-2002-amd1-2008>

Addition to Table 14:

9	Between switching circuit(s) and control circuit(s) if they are electrically separated	5	2 000	3 000
10	Between SELV/PELV circuits and other circuit(s) having a higher voltage than SELV/PELV	7	2 500	3 750
11	Between two SELV/PELV circuits	5	500	500

17 Temperature rise

On page 37, add the following after NOTE 1:

For electronic TDS, Subclause 17.1 of IEC 60669-2-3 is applicable.

Replace the paragraph after NOTE 4 by the following:

The cables connected to the electronic switch shall enter through the top of the box, the point(s) of entry being sealed to prevent the circulation of air. The length of each conductor within the box shall be (80 ± 10) mm.

Page 41

18 Making and breaking capacity

On page 43, add the following before 18.1:

For electronic RCS, Clause 18 of IEC 60669-2-2 applies.

18.1 *Add the following new Addition:*

Addition:

For electronic TDS, Subclause 18.1, 2nd paragraph, of IEC 60669-2-3 applies at the following conditions:

For electronic TDS whose rate of operation is limited by their application (for example, heat or light sensors), the rate of operation is as follows. The electronic TDS is set to the shortest cycle time possible. The electronic switch is re-activated at the end of each cycle within a time of $(2 \pm 0,5)$ s.

All other electronic TDS are subjected to 200 operations at a uniform rate of

- 30 operations per minute if the rated current does not exceed 10 A;*
- 15 operations per minute if the rated current exceeds 10 A but is less than 25 A;*
- 7,5 operations per minute if the rated current is 25 A or more.*

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19 Normal operation

Add the following after the second paragraph:

For general purpose electronic switches with included automatic function the number of operations for tests of Subclauses 19.101, 19.102 and 19.104 is that specified in the relevant subclause. If a manufacturer declares a number of operations higher than those indicated in the relevant subclause, the tests shall be made according to the declared value.

NOTE For the purpose of this test, the manufacturer can provide the specimens with a special circuit that simulates the automatic operations.

Add the following after the third paragraph:

For electronic RCS, Subclause 19.1 of IEC 60669-2-2 applies.

For electronic TDS, Subclause 19.1 of IEC 60669-2-3 applies.