



Switches for household and similar fixed electrical installations

Part 2.1: Particular requirements — Electronic switches (IEC 60669-2-1:2015, MOD)



AS 60669.2.1:2020

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- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Consumer Electronics Suppliers Association
- Consumers Federation of Australia
- Electrical Compliance Testing Association of Australia
- Electrical Regulatory Authorities Council
- Engineers Australia
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Switches for household and similar fixed electrical installations

Part 2.1: Particular requirements — Electronic switches (IEC 60669-2- 1:2015, MOD)

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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee EL-004, Electrical Accessories, to supersede AS/NZS 60669.2.1:2013, *Switches for household and similar fixed electrical installations Part 2.1: Particular requirements — Electronic switches (IEC 60669-2-1, Ed.4.1 (2009) MOD)*.

AS/NZS 60669.2.1:2013 will also remain current for 24 months from the date of publication of this Standard and after this time it will be superseded by AS 60669.2.1:2020. Regulatory authorities that reference this Standard in regulation may apply these requirements at a different time. Users of this Standard should consult with these authorities to confirm their requirements.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide electrical industries with requirements for electronic switches, intended for household and similar fixed electrical installations either indoors or outdoors.

This Standard is an adoption with national modifications and has been reproduced from IEC 60669-2-1:2002 +AMD1:2008+AMD2:2015, (ED 4.2), *Switches for household and similar fixed electrical installations — Part 2-1: Particular requirements — Electronic switches*. The modifications are additional requirements and are set out in Appendix ZZ, which has been added at the end of the source document.

Appendix ZZ lists the variations to IEC 60669-2-1:2002 for the application of this Standard in Australia.

This Standard is to be used in conjunction with AS/NZS 60669.1:2013, *Switches for household and similar fixed-electrical installations, Part 1: General requirements*, which provides general requirements on this subject.

This document is structured as follows:

- (a) Preface.
- (b) IEC 60669-2-1 (unedited from the contents page to the final clause of the source document).
- (c) Appendix ZZ — Australian variations to the source document.

The variations listed in Appendix ZZ address issues including the following:

- (i) M rating test for all switches marked as suitable for controlling motors.
- (ii) Requirements for the fitting of field-installed insulation when required to comply with the requirements for IP protection, insulation resistance and high voltage.

The variations described in Appendix ZZ form the Australian variations for the purposes of the CB Scheme for recognition of testing to standards for safety of electrical equipment (the CB Scheme).

As this document has been reproduced from an International Standard, the following applies:

- (A) In the source text “this part of IEC 60669-2” should read “this Australian Standard”.
- (B) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SWITCHES FOR HOUSEHOLD AND SIMILAR
FIXED ELECTRICAL INSTALLATIONS –****Part 2-1: Particular requirements –
Electronic switches**

FOREWORD

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This Consolidated version of IEC 60669-2-1 bears the edition number 4.2. It consists of the fourth edition (2002-09) [documents 23B/668/FDIS and 23B/682/RVD], its amendment 1 (2008-10) [documents 23B/894/FDIS and 23B/907/RVD] and its amendment 2 (2015-03) [documents 23B/1175/FDIS and 23B/1183/RVD]. The technical content is identical to the base edition and its amendments.

This Final version does not show where the technical content is modified by amendments 1 and 2. A separate Redline version with all changes highlighted is available in this publication.

International Standard IEC 60669-2-1 has been prepared by subcommittee 23B: Plugs, socket-outlets and switches, of IEC technical committee 23: Electrical accessories.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

This part of IEC 60669-2 shall be used in conjunction with IEC 60669-1. It lists the changes necessary to convert that standard into a specific standard for electronic switches.

In this publication, the following print types are used:

- requirements proper: in roman type.
- *test specifications: in italic type.*
- notes: in smaller roman type.

Subclauses, figures, tables or notes which are additional to those in part 1 are numbered starting from 101.

Annex AA is for information only.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability 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,
- withdrawn,
- replaced by a revised edition, or
- amended.

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SWITCHES FOR HOUSEHOLD AND SIMILAR FIXED ELECTRICAL INSTALLATIONS –

Part 2-1: Particular requirements – Electronic switches

1 Scope

This clause of part 1 applies except as follows.

Replacement:

This standard applies to electronic switches and to associated electronic extension units for household and similar fixed electrical installations either indoors or outdoors.

It applies to electronic switches for a.c. only, 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 (for example, those used in ventilating fans) and for other purposes (for example, heating controls), with a rated voltage not exceeding 250 V and a rated current not exceeding 16 A.

The operation and/or control as mentioned above are performed by a person via an actuating member, a sensing surface or a sensing unit, by means of touch, proximity, turn, optical, acoustic, thermal or any other influence.

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.

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

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.

Electronic switches complying with this standard are suitable for use at ambient temperature not normally exceeding 25 °C but occasionally reaching 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 constructions may be required.

NOTE 3 This standard is not intended to cover devices which are designed to be incorporated in appliances or are intended to be delivered together with a specific appliance and which are within the scope of IEC 60730 or IEC 61058-1.

Examples of designs of electronic switches and functions are shown in annex AA.

NOTE 4 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.

2 Normative references

This clause of part 1 applies except as follows.

Addition:

IEC 60065:2001, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60085:1984, *Thermal evaluation and classification of electrical insulation*

IEC 60127 (all parts), *Miniature fuses*

IEC 60227-5:1997, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 5: Flexible cables (cords)*¹⁾

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

IEC 60317-0-1:1997, *Specifications for particular types of winding wires – Part 0: General requirements – Section 1: Enamelled round copper wire*¹⁾

IEC 60384-14:1993, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

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 60730 (all parts), *Automatic electrical controls for household and similar use*

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 61000-2-2:2002, *Electromagnetic compatibility (EMC) – Part 2-2: Environment – Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems*

IEC 61000-3-2:2000, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current $\leq 16\text{ A}$ per phase)*¹⁾

IEC 61000-3-3:1994, *Electromagnetic compatibility (EMC) – Part 3: Limits – Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current $\leq 16\text{ A}$* ¹⁾

¹⁾ A consolidated version of this standard exists.

IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test*¹⁾

IEC 61000-4-3:2002, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test*

IEC 61000-4-5:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 5: Surge immunity test*¹⁾

IEC 61000-4-6:1996, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 6: Immunity to conducted disturbances, induced by radio-frequency fields*¹⁾

IEC 61000-4-8:1993, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 8: Power frequency magnetic field immunity test*¹⁾

IEC 61000-4-11:1994, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 11: Voltage dips, short interruptions and voltage variations immunity tests*¹⁾

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

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 62756-1, *Digital load side transmission lighting control – Part 1: Basic requirements*

CISPR 14 (all parts), *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus*

CISPR 15:2013, *Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment*

ISO 306:1994, *Plastics – Thermoplastic materials – Determination of Vicat softening temperature (VST)*

3 Definitions

This clause of part 1 applies with the following additions.

Addition, after the first paragraph:

The term “electronic switch” is used as a general term to cover both electronic switching and control devices.

3.101

rated load

load assigned to the electronic switch by the manufacturer

¹⁾ A consolidated version of this standard exists.

3.102**minimum load**

lowest load at which the electronic switch still operates correctly

3.103**minimum current**

lowest current at which the electronic switch still operates correctly

3.104**electromechanically operated contact mechanism**

component which operates the parts used to open and close the circuit electromechanically

3.105**semiconductor switching device**

switching device designed to make or break the current in an electric circuit by means of the controlled conductivity of a semiconductor in that circuit

NOTE 1 In a circuit where the current passes through zero (periodically or otherwise) the effect of “not making” the current following such a zero value is equivalent to breaking the current.

NOTE 2 Typical examples of semiconductor switching devices are:

- electronic switching devices using the phase-cut-on principle to control the load by electronic switching on the current at any phase angle at or after zero crossing in each half-wave, for example, by a thyristor;
- electronic switches using the phase-cut-off principle to control the load by switching off the current at any phase angle after zero crossing in each half-wave, for example, by a transistor in a diode bridge.

3.106**electronic momentary contact switch**

electronic switch with an electromechanical switching mechanism or a semiconductor switching device which returns automatically to the initial state after operation

3.107**mechanical control unit**

unit directly adjustable by mechanical means (for example, potentiometer) which controls the output via electronic components

3.108**electronic output control unit**

unit adjustable by other than mechanical means (for example, sensing unit), containing electronic components and controlling the output via electronic components

3.109**electronic extension unit**

unit permitting the control of an electronic switch from a distance

3.110**protective impedance**

impedance connected between live parts and accessible conductive parts, of such value that the current, in normal use and under likely fault conditions in the electronic switch, is limited to a safe value, and which is so constructed that the reliability is maintained throughout the life of the electronic switch.

3.111**external flexible cable**

cable, a part of which is external to the electronic output control unit.

NOTE Such cable may either be a supply cable or a connecting cable between separate parts of an accessory.

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

3.126

self ballasted lamp

unit which cannot be dismantled without being permanently damaged which is provided with a lamp cap or caps and incorporating a light source and any additional elements necessary for starting and stable operation of the light source

NOTE In the text self ballasted lamp are also called CFLi or LEDi where “i” means that the control gear is incorporated in the lamp.

3.127

externally ballasted lamp

lamp other than an incandescent lamp which cannot be dismantled without being permanently damaged which is provided with a lamp cap and incorporating a light source to be controlled by a separate lamp control gear

NOTE For lamp control gear, see definitions in IEC 61347-1

3.128

conduction angle

- a) for a leading edge (forward phase) dimmer, phase angle measured from the point where conduction begins to the end of the half wave (zero crossing)

- b) for a trailing edge (reverse phase) dimmer, phase angle measured from the beginning of a half wave (zero crossing) to the point where conduction is switched off

4 General requirements

This clause of part 1 applies.

5 General notes on tests

This clause of part 1 applies except as follows.

5.4 Addition

The number of test specimens is shown in 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	19.109	24	26	101 and 102
Marked with one rated current and								
one rated voltage	3	3 ^a	3 ^a	3 ^a	3 ^a	3	1	3 ^c
two rated voltages	6	6 ^a	6 ^a	6 ^a	6 ^a	6	1	6 ^{b,c,d}
^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. ^d It may be necessary to provide 3 additional specimens for the test of 101.1.1.2.								

5.101 *All measurements shall be carried out by methods which are suitable for the purpose, which do not appreciably affect the values to be measured and which are not affected by factors such as waveform.*

NOTE Care should be taken to use instruments giving true r.m.s. indications.

5.102 *If the electronic circuitry is so enclosed that the short-circuiting or disconnecting of components is impossible or difficult, the manufacturer shall provide one additional test specimen with leads connected for measurements, short-circuiting, etc.*

It is not necessary to connect leads to the interior of hybrid and monolith integrated circuits.

5.103 *It may be necessary to disconnect electronic components for tests.*

5.104 *For electronic switches equipped with cut-outs, it may be necessary to provide three additional specimens for the test of 102.4.1.*

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

This clause of part 1 applies except as follows.

Replacement:

6.1 Preferred rated voltages are 110 V, 120 V, 130 V, 220 V, 230 V and 240 V.

6.2 This subclause of part 1 does not apply.

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

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.

7 Classification

7.1 This subclause of part 1 applies except as follows.

7.1.1 *Addition:*

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

7.1.5 *Addition:*

- touch;
- proximity;
- optical;
- acoustic;
- other external influences.

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

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.

7.1.6 *Addition:*

- electronic switches only intended to be mounted at a height greater than 1,7 m.

7.1.101 according to the kind of load intended to be controlled by the electronic switch:

- incandescent lamps;
- externally ballasted lamps (e.g. fluorescent lamps, CFL, LED);
- motors;
- self ballasted lamps (e.g. CFLi, LEDi);
- declared load.

7.2 This subclause of part 1 does not apply.

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

This clause of part 1 applies except as follows.

8.1 *Replacement:*

Electronic switches shall be marked with

- rated voltage in volts;
- rated current in amperes or rated load in volt-amperes or watts;
- symbol for nature of supply;
- manufacturer's or responsible vendor's name, trade mark or identification mark;
- type reference, which may be a catalogue number;
- symbol for mini-gap construction, if applicable;
- symbol for micro-gap construction, if applicable;
- symbol for semiconductor switching device, if applicable;
- first characteristic numeral for the degree of protection against access to hazardous parts and against harmful effects due to ingress of solid objects, if declared higher than 2, in which case the second characteristic numeral shall also be marked;
- second characteristic numeral for the degree of protection against harmful effects due to ingress of water, if declared higher than 0, in which case the first characteristic numeral shall also be marked.

NOTE 1 Marking of the pattern number given in 7.1.1 is recommended if the connections are not clear from an inspection of the electronic switch; this pattern number may be part of the type reference.

NOTE 2 If a base carries two or more electronic switches with separate operating devices, marking with the pattern numbers is recommended, for example 1+6 or 1+1+1.

NOTE 3 For electronic switches suitable for more than one type of rated load, see 8.3.

In addition, electronic switches shall be marked with

- rated frequency in hertz, unless the electronic switch is designed for both 50 Hz and 60 Hz;
- rating and type of any fuse incorporated in the electronic switch;
- symbols for the kind of load (see 8.2);
- the term “extension unit”, if applicable, or the relevant translation in the official language(s) of the country in which the product is to be sold, followed by the identifying reference;
- the minimum height for mounting the electronic switch shall be indicated in the installation instruction of the manufacturer if there is a restriction (see 10.1).

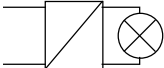
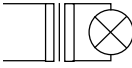
In addition, electronic switches with screwless terminals shall be marked with an indication of the suitability to accept rigid conductors only, for those electronic switches having this restriction. This information may be put on the electronic switch and/or on the packaging unit.

For electronic switches with included automatic function if the manufacturer's declared number of operations is higher than that indicated in subclauses 19.101, 19.102, 19.104 and 19.109, then this shall be stated in the accompanying instruction sheet.

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 Addition:

Volt-ampere	VA
Watt	W
Hertz	Hz
Terminal for regulated load	
Type of load:	
Incandescent lamps	
Externally ballasted fluorescent lamps	
Motors	
Electronic step-down converter for extra low-voltage incandescent lamps (for example, halogen)	
Iron core transformer for extra low-voltage incandescent lamps (for example, halogen)	

NOTE The rating and type of any fuse may be marked with symbols (see IEC 60127).

If other particular symbols are used, they shall be explained in the installation instructions.

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 Replacement of the first paragraph:

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

- 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),
- either the name, trade mark or identification mark of the manufacturer or of the responsible vendor,
- length of insulation to be removed before the insertion of the conductor into the screwless terminal, if any,

- symbol for mini-gap construction, micro-gap construction or semiconductor device, if applicable,
- the type reference.

NOTE 1 The type reference may be the series reference only.

Where an electronic switch is suitable for more than one type of load if not already marked on the electronic switch, the information concerning these shall be stated in the accompanying instruction sheet. In addition, the minimum and the maximum current or the minimum and the maximum load in volt-ampere or watt shall be stated for each type of load.

Addition:

If a dimmer is intended to be used together with an iron core transformer, information shall be given in the manufacturer's instructions that only a transformer intended to be used with a dimmer shall be used.

8.4 Addition:

If there are more than two terminals, the load terminal shall be marked with an arrow pointing away from the terminal or with one of the symbols mentioned in 8.2 and any other terminals shall be marked corresponding to the installation instructions.

Unless the installation of the electronic switch is made clear by the markings of the terminals, a wiring diagram shall be provided with each electronic switch.

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.

8.6 Addition:

The off-state shall not be marked with an "O" if the circuit on the load side is considered as live, in accordance with clause 10.

8.6.101 It is recommended that the actual state of the electronic switch intended to control the brightness of lamps be indicated when used as intended. This can be achieved either

- with marking on the on-/off-state position, or
- with an indicator lamp, or
- by adjusting the lamp dimmer so that at the lowest control state and at rated voltage minus 10 %, the light is still visible.

NOTE A test to verify that the light is still visible is under consideration.

When the indication of the electronic switch state is given only by the lamp, adjustment of the lamp at the lowest control state is made as specified in the following:

- for incandescent lamps, the adjustment of lamp dimmers shall be made by the manufacturer. It shall not be possible to reduce the lowest setting without a tool;
- for fluorescent lamps, the adjustment of lamp dimmers shall be made by the manufacturer. It may, however, be possible for the installer to alter the lowest setting if such an adjustment is indicated in an installation instruction.

8.8 Addition after the second paragraph:

If an electronic switch containing a viewing window (lens) for a sensing device is intended to be mounted at a height greater than 1,7 m, this information shall be stated in the instruction sheet.

Addition to note 2:

- information concerning external, directly associated fuses/current limiting devices, where applicable.

9 Checking of dimensions

This clause of part 1 applies except as follows.

Addition:

Electronic switches may be of dimensions other than those specified in the standard sheets (if any) provided they are supplied with suitable boxes.

10 Protection against electric shock

This clause of part 1 applies except as follows.

10.1 Addition:

NOTE 1 For the purpose of this standard, metal sensing surfaces which are connected to live parts by means of protective impedances (see 10.2) are not considered to be live parts.

Replacement of the 6th and 7th paragraphs:

During this additional test, the electronic switches are subjected for 1 min to a force applied through the tip of test probe 11 of IEC 61032.

This probe, with an electrical indicator as described above, is applied with a force of 75 N to all places where yielding of the insulating material could impair the safety of the electronic switch, but is applied to thin-walled knock-outs with a force of 10 N.

Viewing windows or the like on electronic switches intended to be mounted at a height greater than 1,7 m are subjected to a force of 30 N.

The test probe is not applied to membranes and the like. These parts are tested according to 13.15.1.

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.

10.2 Addition:

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

For electronic switches classified according to 7.1.4, first dash, accessible parts which are needed for the operation of electronic switches (for example, sensing surfaces) may be connected to live parts. If they are connected to live parts, it shall be by means of a protective impedance.

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. The resistors shall comply with the requirements given in 102.3, and the capacitors shall comply with the requirements given in 102.2.