

INTERNATIONAL STANDARD



This extended version of IEC 60669-2-3:2024 includes the content of the references made to IEC 60669-1:2017

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

Document Preview

[IEC 60669-2-3:2024](https://standards.iteh.ai/catalog/standards/iec/f294fb74-8394-4eba-acbe-69e65c619dda/iec-60669-2-3-2024)

<https://standards.iteh.ai/catalog/standards/iec/f294fb74-8394-4eba-acbe-69e65c619dda/iec-60669-2-3-2024>



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2024 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

International Standards
Document Preview

[IEC 60669-2-3:2024](https://standards.iteh.ai/catalog/standards/iec/f294fb74-8394-4eba-aebe-69e65c619dda/iec-60669-2-3-2024)

<https://standards.iteh.ai/catalog/standards/iec/f294fb74-8394-4eba-aebe-69e65c619dda/iec-60669-2-3-2024>



IEC 60669-2-3

Edition 4.0 2024-03
EXTENDED VERSION

INTERNATIONAL STANDARD



This extended version of IEC 60669-2-3:2024 includes the content of the references made to IEC 60669-1:2017

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

Document Preview

[IEC 60669-2-3:2024](https://standards.iteh.ai/catalog/standards/iec/f294fb74-8394-4eba-aebe-69e65c619dda/iec-60669-2-3-2024)

<https://standards.iteh.ai/catalog/standards/iec/f294fb74-8394-4eba-aebe-69e65c619dda/iec-60669-2-3-2024>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.120.40

ISBN 978-2-8322-8541-1

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	7
1 Scope.....	10
2 Normative references	11
3 Terms and definitions	13
4 General requirements	18
5 General remarks on tests	18
5.101 Incorporated hand-operated device.....	21
5.102 Operated by hand	21
5.103 Control and switching circuits without common point.....	21
6 Ratings.....	21
6.1 Rated voltage	21
6.2 Rated current.....	21
6.3 Preferred combinations of number of poles and ratings.....	22
6.101 Rated control voltage.....	22
7 Classification.....	23
8 Marking	24
8.1 General.....	24
8.2 Symbols.....	25
8.3 Visibility of markings	27
8.4 Marking on terminals for phase conductors	27
8.5 Marking on terminals for neutral and earth conductors	28
8.6 Marking of the switch position	28
8.7 Additional requirements for marking.....	29
8.8 Durability	29
9 Checking of dimensions.....	29
10 Protection against electric shock	29
10.1 Prevention of access to live parts.....	29
10.2 Requirements for operating parts.....	30
10.3 Requirements for accessible metal parts.....	30
10.4 Requirements for insulation of the mechanism	31
10.5 Requirements for insulation of the mechanism with respect to the surrounding environment	31
10.6 Requirements for switches operated indirectly	31
10.7 Requirements for switches with replaceable pull cord	32
11 Provision for earthing	32
11.1 General.....	32
11.2 Earthing terminals.....	32
11.3 Requirements for surface-type switches.....	32
11.4 Test for earthing connection.....	32
12 Terminals	33
12.1 General.....	33
12.2 Terminals with screw clamping for external copper conductors	33
12.3 Screwless terminals for external copper conductors.....	39
13 Constructional requirements	44
13.1 Mechanical requirements for insulating means	44
13.2 Installation requirements.....	45

13.3	Fixing of covers, cover plates and actuating members	46
13.4	Openings in normal use	47
13.5	Attachment of knobs	47
13.6	Mounting means	48
13.7	Combination of switches	48
13.8	Accessories combined with switches.....	48
13.9	Surface-type switches having an IP code higher than IP20	48
13.10	Installation in a box.....	49
13.11	Connection of a second current-carrying conductor.....	49
13.12	Inlet openings	49
13.13	Provision for back entry from a conduit	50
13.14	Switch provided with membranes or the like for inlet openings	51
13.15	Requirements for membranes in inlet openings.....	51
13.16	Pilot light units	52
13.101	Reset function.....	52
13.102	Transformers intended for SELV circuits	52
14	Mechanism	52
14.1	Indication of the position	52
14.2	Rest and intermediate position.....	52
14.3	Undue arcing	52
14.4	Making and breaking	52
14.5	Action of the mechanism without cover or cover plate	53
14.6	Pull force for cord-operated switches	53
14.101	Hand-operated device with position indicator	53
15	Resistance to ageing, protection provided by enclosures of switches and resistance to humidity	53
15.1	Resistance to ageing	53
15.2	Protection provided by enclosures of switches	54
15.2.1	General	54
15.2.2	Protection against access to hazardous parts and against harmful effects due to ingress of solid foreign objects	54
15.2.3	Protection against harmful effects due to ingress of water	55
15.3	Resistance to humidity	56
16	Insulation resistance and electric strength	57
16.1	General.....	57
16.2	Test for measuring the insulation resistance	57
16.3	Electric strength test.....	59
17	Temperature rise	61
17.1	General.....	61
17.2	Switches incorporating pilot lights	62
18	Making and breaking capacity.....	63
18.1	General.....	63
18.2	Overload	63
18.3	Overload test with filament lamps	64
19	Normal operation	65
19.1	Test for switches intended for inductive loads	65
19.2	Test for switches intended for externally ballasted lamp loads	68
19.3	Test for switches intended for self ballasted lamp loads	70
19.101	TDS control voltage test.....	73

19.102	TDS delay time accuracy	73
19.103	TDS delay after revert operation	73
20	Mechanical strength	74
20.1	General.....	74
20.2	Pendulum hammer test	74
20.3	Test on the main parts of surface-type switches.....	77
20.4	Screwed glands	77
20.5	Covers, cover plates or actuating members – accessibility to live parts.....	77
20.5.1	General	77
20.5.2	Verification of the non-removal of covers, cover plates or actuating members	77
20.5.3	Verification of the removal of covers, cover plates or actuating members.....	78
20.6	Covers, cover plates or actuating members – accessibility to non-earthed metal parts separated from live parts	78
20.7	Covers, cover plates or actuating members – accessibility to insulating parts, earthed metal parts, the live parts of SELV ≤ 25 V AC and 60 V DC or metal parts separated from live parts	78
20.8	Covers, cover plates or actuating members – application of gauges.....	78
20.9	Grooves, holes and reverse tapers	79
20.10	Additional test for cord-operated switch	79
21	Resistance to heat.....	79
21.1	General.....	79
21.2	Basic heating test	80
21.3	Ball-pressure test on parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuit in position.....	80
21.4	Ball-pressure test on parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position.....	80
22	Screws, current-carrying parts and connections.....	81
22.1	General.....	81
22.2	Correct insertion of screws	81
22.3	Contact pressure of electrical connections	82
22.4	Screws and rivets used both as electrical and mechanical connections.....	82
22.5	Material of current-carrying parts	82
22.6	Contacts subjected to sliding actions	83
22.7	Thread-forming and thread-cutting screws	83
23	Creepage distances, clearances and distances through sealing compound.....	83
23.1	General.....	83
23.2	Insulating compound	87
23.101	Control circuits for connections to a SELV	87
23.102	Use of enamel wires	87
24	Resistance of insulating material to abnormal heat, to fire and to tracking	87
24.1	Resistance to abnormal heat and to fire	87
24.2	Resistance to tracking.....	88
25	Resistance to rusting	89
26	EMC requirements	89
26.1	Immunity	89
26.2	Emission	89
101	Abnormal operation of the control circuit.....	89

Annex A (normative) Additional requirements for switches having facilities for the outlet and retention of flexible cables	110
Annex B (informative) 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	113
Annex C (informative) Circuit development (19.3)	114
C.1 Rationale	114
C.2 I_{peak} and I^2t for normal operation tests	114
C.2.1 General	114
C.2.2 Switching a single lamp	114
C.2.3 Switching multiple lamps	116
Annex D (informative) Additional requirements for insulation-piercing terminals	118
Annex E (informative) Additional requirements and tests for switches intended to be used at a temperature lower than -5 °C	128
Bibliography	130
Figure 1 – Pillar terminals	91
Figure 2 – Screw head terminals and stud terminals	93
Figure 3 – Saddle terminals	93
Figure 4 – Lug terminals	94
Figure 5 – Mantle terminals	95
Figure 6 – Thread-forming screw	95
Figure 7 – Thread-cutting screw	95
Figure 8 – Classification according to connections	96
Figure 9 – Test apparatus for checking damage to conductors	97
Figure 10 – Information for deflection test	98
Figure 11 – Circuit diagrams for making and breaking capacity and normal operation	99
Figure 12 – Circuit diagrams for testing switches	100
Figure 13 – Arrangement for test on cover-plates	100
Figure 14 – Gauge (thickness: about 2 mm) for the verification of the outline of covers, cover-plates or actuating members	101
Figure 15 – Example of application of the gauge of Figure 14 on covers fixed without screws on a mounting surface or supporting surface	102
Figure 16 – Examples of applications of the gauge of Figure 14 in accordance with the requirements of 20.8	103
Figure 17 – Gauge for verification of grooves, holes and reverse tapers	104
Figure 18 – Sketch showing the direction of application of the gauge of Figure 17	104
Figure 19 – Ball-pressure apparatus	105
Figure 20 – Determining parts of insulating material to be tested – Diagrammatic representation (see 24.1)	105
Figure 21 – Test wall in accordance with the requirements of 15.2.3	106
Figure 22 – Direction for the conductor pull of 30 N for 1 min	108
Figure 23 – Examples of membranes and grommets	109
Figure C.1 – 120 V 15 W (LT spice model)	115
Figure C.2 – 230 V 15 W (LT spice model)	116
Figure C.3 – Model for multiple lamp loads	117
Figure C.4 – I_{peak} and I^2t for multiple lamp loads	117

Figure D.1 – Example of insulation-piercing terminals	126
Figure D.2 – Example of test-points	126
Figure D.3 – Temperature cycle for the voltage drop test of 12.4.11	127
Table 1 – Number of specimens needed for the tests	20
Table 2 – Relationship between rated current of the switch and rated power of the SBL circuit.....	22
Table 3 – Preferred combinations of numbers of poles and ratings	22
Table 4 – Relationship between rated currents and connectable cross-sectional areas of copper conductors	33
Table 5 – Tightening torque for the verification of the mechanical strength of screw-type terminals	35
Table 6 – Test values for flexion and pull out for copper conductors	36
Table 7 – Test values for pulling out test.....	37
Table 8 – Relationship between rated currents and connectable cross-sectional areas of copper conductors for screwless terminals.....	39
Table 9 – Test current for the verification of electrical and thermal stresses in normal use of screwless terminals	42
Table 10 – Cross-sectional areas of rigid copper conductors for deflection test of screwless terminals	44
Table 11 – Deflection test forces.....	44
Table 12 – Forces to be applied to covers, cover-plates or actuating members whose fixing is not dependent on screws	47
Table 13 – External cable diameter limits for surface type switches	50
Table 14 – Points of application of the test voltage for the verification of insulation resistance and electric strength	57
Table 15 – Test voltage, points of application and minimum values of insulating resistance for the verification of electric strength	60
Table 16 – Temperature-rise test currents and cross-sectional areas of copper conductors	61
Table 17 – Fractions of total number of operations.....	64
Table 18 – Number of operations for normal operation test.....	66
Table 19 – Values for I_{peak} and I^2t depending on the type of distribution system	71
Table 20 – Calculated circuit parameters	71
Table 21 – Height of fall for impact test.....	75
Table 22 – Torque for the verification of the mechanical strength of glands	77
Table 23 – Creepage distances, clearances and distances through insulating sealing compound.....	84
Table A.1 – Limits of external dimensions of flexible cables	111
Table C.1 – Lamp	114
Table D.1 – Specimens needed for Clause 12 for insulation-piercing terminals (IPTs)	119
Table D.2 – Relationship between rated currents and connectable cross-sectional areas of copper conductors for insulation-piercing terminals	121
Table D.3 – Test current for the verification of electrical and thermal stresses in normal use of insulation-piercing terminals	125

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SWITCHES FOR HOUSEHOLD AND SIMILAR FIXED
ELECTRICAL INSTALLATIONS –****Part 2-3: Particular requirements –
Time-delay switches (TDS)**

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This extended version (EXV) of the official IEC Standard provides the user with the comprehensive content of the Standard.

IEC 60669-2-3:2024 EXV includes the content of IEC 60669-2-3:2024, and the references made to IEC 60669-1:2017.

The specific content of IEC 60669-2-3:2024 is displayed on a blue background.

IEC 60669-2-3 has been prepared by subcommittee 23B: Plugs, socket-outlets and switches, of IEC technical committee 23: Electrical accessories. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2006. This edition constitutes a technical revision.

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

- a) Revision of the present edition with reference to IEC 60669-1:2017 (Edition 4);
- b) Introduction of a revision to Annex E "Additional requirements and tests for switches intended to be used at a temperature lower than $-5\text{ }^{\circ}\text{C}$ ".

The text of this International Standard is based on the following documents:

Draft	Report on voting
23B/1487/FDIS	23B/1501/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

This part of IEC 60669-2 is to be used in conjunction with IEC 60669-1:2017. It lists the changes necessary to convert that standard into a specific standard for time-delay switches.

When a particular subclause of IEC 60669-1:2017 is not mentioned in this document, that subclause applies as far as reasonable.

In this document, the following print types are used:

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

Subclauses, figures or tables which are additional to those in IEC 60669-1:2017 are numbered starting from 101.

A list of all parts of IEC 60669 series, 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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document 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.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 60669-2-3:2024](https://standards.iteh.ai/catalog/standards/iec/f294fb74-8394-4eba-aebe-69e65c619dda/iec-60669-2-3-2024)

<https://standards.iteh.ai/catalog/standards/iec/f294fb74-8394-4eba-aebe-69e65c619dda/iec-60669-2-3-2024>

SWITCHES FOR HOUSEHOLD AND SIMILAR FIXED ELECTRICAL INSTALLATIONS –

Part 2-3: Particular requirements – Time-delay switches (TDS)

1 Scope

This part of IEC 60669 applies to time-delay switches (hereinafter referred to as TDS) with a rated voltage not exceeding 440 V AC and a rated current not exceeding 63 A, intended for household and similar fixed electrical installations, either indoors or outdoors, operated by hand and/or by remote control. For the control circuit, the rated control voltage does not exceed 440 V AC or 220 V DC.

TDS are provided with a time-delay device operated by mechanical, thermal, pneumatic, hydraulic or electrical means or by a combination of them.

Electronic TDS are within the scope of IEC 60669-2-1 but not of this document.

TDS including only passive components such as resistors, capacitors, positive temperature coefficient (PTC) and negative temperature coefficient (NTC) components and printed circuit boards are not considered to be electronic TDS.

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

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

IEC 60445:2021, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

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

IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 60664-3:2016, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60669-1:2017, *Switches for household and similar fixed electrical installations – Part 1: General requirements*

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*

IEC 61558-2-6:2021, *Safety of transformers, reactors, power supply units and combinations thereof – Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers for general applications*

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*