# IEC 60669-1

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# INTERNATIONAL STANDARD

colour inside

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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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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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) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

**This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

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 ~~An extension of the scope to switches for rated voltages higher than 440 V is under consideration.~~ 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 ~~In this standard specific requirements are given for boxes, while~~ General requirements for boxes for ~~ordinary~~* 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 ~~part 2~~ IEC 60669-2-2);
– switches incorporating a time-delay device (particular requirements are given in ~~part 2~~ 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 ~~part 2~~ IEC 60669-2-1);
– switches having facilities for the outlet and retention of flexible cables (see Annex A);

~~* See note 1 to 7.1.4.~~

– 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).

~~NOTE 3 – The minimum length of the flexible cable used with these switches may be governed by National Wiring Rules.~~

Switches complying with this document are suitable for use at ambient temperatures not normally exceeding ~~+25~~ 40 °C, but ~~occasionally reaching~~ 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 ~~Additional requirements for flush-type non-ordinary switches are under consideration.~~ For lower temperatures see Annex E.

~~NOTE 5~~ 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.

~~This standard does not include requirements and tests for switches with protection against ingress of solid foreign bodies. These are under consideration.~~

## 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:~~1979~~ 2009, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials ~~under moist conditions~~*

IEC 60212:~~1971~~ 2010, *Standard conditions for use prior to and during the testing of solid electrical insulation materials*

~~IEC 60227-1:1993, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 1: General requirements*~~

~~IEC 60227-3:1993, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 3: Non-sheathed cables for fixed wiring*~~

~~IEC 60227-4:1992, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 4: Sheathed cables for fixed wiring*~~

IEC 60227-5:~~1979~~ 2011, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 5: Flexible cables (cords)*
~~Amendment 1 (1987)~~

IEC 60228:2004, *Conductors of insulated cables*

~~IEC 60245-1:1994, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 1: General requirements*~~

IEC 60245-4:~~1994~~ 2011, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 4: Cords and flexible cables*

~~IEC 60364-4-46: 1981, *Electrical installations of buildings – Part 4: Protection for safety – Chapter 46: Isolation and switching*~~

IEC 60417~~:1973~~, *Graphical symbols for use on equipment~~. Index, survey and compilation of the single sheets~~* (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 60670:1989, *General requirements for enclosures for accessories for household and similar fixed electrical installations*~~

~~IEC 60695-2-1: 1991, *Fire hazard testing – Part 2: Test methods – Section 1: Glow-wire test and guidance*~~

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: *Connecting devices for low voltage circuits for household and similar purposes*~~

IEC 60998-1:~~1990~~ 2002, *Connecting devices for low voltage circuits for household and similar purposes – Part 1: General requirements*

IEC 60998-2-1~~:1990~~, *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~~:1991~~, *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 60999-1: 1990, *Connecting devices – Safety requirements for screw-type and screwless-type clamping units for electrical copper conductors – Part 1: General requirements and particular requirements for conductors from 0,5 mm$^2$ up to 35 mm$^2$ (included)*~~

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

ISO 1456:~~1988~~ 2009, *Metallic and other inorganic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

~~ISO 2039-2:1987, *Plastics – Determination of hardness – Part 2: Rockwell hardness*~~

ISO 2081:~~1986~~ 2008, *Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel*

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# 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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– isolating switches (particular requirements are given in IEC 60669-2-4);
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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.

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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*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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# INTERRUPTEURS POUR INSTALLATIONS ÉLECTRIQUES FIXES DOMESTIQUES ET ANALOGUES –

## Partie 1: Exigences générales

## AVANT-PROPOS

1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 60669-1 a été établie par le sous-comité 23B: Prises de courant et interrupteurs, du comité d'études 23 de l'IEC: Petit appareillage.

Cette quatrième édition annule et remplace la troisième édition parue en 1998, l'Amendement 1:1999 et l'Amendement 2:2006. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) modification du domaine d'application concernant les interrupteurs pour charge moteur;
b) suppression de certaines références normatives datées;
c) modifications relatives aux définitions;

d) dans l'Article 5, le nombre d'échantillons à utiliser pour les essais est clairement indiqué dans le Tableau 1 (L'Annexe A correspondante de l'IEC 60669-1:1998 a donc été supprimée en conséquence);

e) dans l'Article 5, ajout de précisions concernant les interrupteurs sur lesquels les essais de l'Article 19 doivent être effectués;

f) ajout d'exigences relatives aux interrupteurs 13 A;

g) indication obligatoire signalant qu'une borne est adaptée pour un conducteur rigide uniquement;

h) ajout d'exigences et de conditions d'essai pour les conducteurs souples à l'Article 12;

i) ajout d'exigences relatives aux lampes indicatrices;

j) ajout d'un nouvel essai pour les charges par lampe à ballast intégré en 19.3;

k) Le Tableau 20 a été entièrement revu afin de couvrir les interrupteurs à distance normale d'ouverture des contacts, à faible distance d'ouverture des contacts et à microdistance d'ouverture des contacts et a été renuméroté Tableau 23;

l) ajout d'une nouvelle Annexe B informative comprenant les modifications prévues pour aligner l'IEC 60669-1 avec les exigences de l'IEC 60998 (toutes les parties), de l'IEC 60999 (toutes les parties) et de l'IEC 60228;

m) ajout d'une nouvelle Annexe C informative relative au développement du circuit pour 19.3;

n) ajout d'une nouvelle Annexe D informative comprenant des exigences complémentaires pour les bornes à perçage d'isolant;

o) ajout d'une nouvelle Annexe E informative comprenant des exigences et des essais supplémentaires pour les interrupteurs à utiliser à une température inférieure à −5 °C.

Le texte de cette norme est issu des documents suivants:

| FDIS | Rapport de vote |
|---|---|
| 23B/1235/FDIS | 23B/1241/RVD |

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Dans la présente norme, les caractères d'imprimerie suivants sont employés:

- *déclarations de conformité: caractères italiques*

Une liste de toutes les parties de la série IEC 60669, publiées sous le titre général *Interrupteurs pour installations électriques fixes domestiques et analogues,* peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

Le contenu du corrigendum de janvier 2020 a été pris en considération dans cet exemplaire.

**IMPORTANT – Le logo *"colour inside"* qui se trouve sur la page de couverture de cette publication indique qu'elle contient des couleurs qui sont considérées comme utiles à une bonne compréhension de son contenu. Les utilisateurs devraient, par conséquent, imprimer cette publication en utilisant une imprimante couleur.**

# INTERRUPTEURS POUR INSTALLATIONS ÉLECTRIQUES FIXES DOMESTIQUES ET ANALOGUES –

## Partie 1: Exigences générales

## 1 Domaine d'application

La présente partie de l'IEC 60669 s'applique aux interrupteurs fonctionnels pour courant alternatif seulement à commande manuelle pour usages courants, de tension assignée ne dépassant pas 440 V et de courant assigné ne dépassant pas 63 A, destinés aux installations électriques fixes domestiques et analogues soit intérieures soit extérieures.

Pour les interrupteurs équipés de bornes sans vis, le courant assigné est limité à 16 A.

NOTE 1 Le courant assigné est limité à 16 A pour les interrupteurs équipés de bornes à perçage d'isolant (BPI), conformément à l'Annexe D.

Les interrupteurs couverts par le présent document sont destinés à commander, en usage normal, les charges suivantes, telles qu'applicables:

– un circuit de charge par lampe à filament de tungstène;
– un circuit de charge par lampe à ballast externe (LED, CFL, charge par lampe à fluorescence, par exemple);
– un circuit pour charge par lampe à ballast intégré (LEDi ou CFLi, par exemple);
– un circuit de charge pratiquement résistive avec un facteur de puissance supérieur ou égal à 0,95;
– un circuit monophasé de charge par moteur de courant assigné ne dépassant pas 3 A à 250 V (750 VA) et 4,5 A à 120 V (540 VA) et de facteur de puissance supérieur ou égal à 0,6. Cela s'applique à la fois aux interrupteurs de courant assigné supérieur ou égal à 10 A n'étant pas soumis à des essais supplémentaires et aux interrupteurs à contact momentané de courant assigné supérieur ou égal à 6 A n'étant pas soumis à des essais supplémentaires.

NOTE 2 Dans le pays suivant, la capacité d'un interrupteur à commander le courant d'appel d'un moteur doit être vérifiée par des essais: AU.

Le présent document s'applique également aux boîtes des interrupteurs, à l'exception des boîtes de montage pour interrupteurs pour pose encastrée.

NOTE 3 Des exigences générales pour les boîtes pour interrupteurs pour pose encastrée sont données dans l'IEC 60670-1.

Le présent document s'applique aussi aux interrupteurs tels que

– les interrupteurs comprenant des lampes indicatrices;
– les télérupteurs électromagnétiques (les exigences particulières sont données dans l'IEC 60669-2-2);
– les interrupteurs comprenant un dispositif à action différée (les exigences particulières sont données dans l'IEC 60669-2-3);
– les combinaisons d'interrupteurs et d'autres fonctions (à l'exception des interrupteurs combinés avec des fusibles);
– les interrupteurs électroniques (les exigences particulières sont données dans l'IEC 60669-2-1);

– les interrupteurs ayant des dispositifs de sortie et de retenue pour câbles souples (voir Annexe A);
– les interrupteurs-sectionneurs (les exigences particulières sont données dans l'IEC 60669-2-4);
– les interrupteurs et appareils associés pour usage dans les systèmes électroniques des foyers domestiques et bâtiments (les exigences particulières sont données dans l'IEC 60669-2-5);
– les interrupteurs pompiers (les exigences particulières sont données dans l'IEC 60669-2-6).

Les interrupteurs conformes au présent document sont adaptés à un usage à des températures ambiantes ne dépassant pas habituellement +40 °C, mais dont la moyenne sur une période de 24 h ne dépasse pas +35 °C, avec une température de l'air ambiant dont la limite inférieure est de –5 °C.

NOTE 4 Voir l'Annexe E pour les températures inférieures.

Les interrupteurs conformes au présent document sont seulement prévus pour être incorporés dans un matériel de manière telle et à un emplacement tel qu'il soit improbable que l'environnement atteigne une température dépassant +35 °C.

Dans des emplacements présentant des conditions particulières, par exemple à bord de navires, dans des véhicules, etc., et dans des emplacements dangereux où par exemple des explosions peuvent se produire, des exigences constructives spécifiques et/ou supplémentaires peuvent être exigées.

## 2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60038:2009, *Tensions normales de la CEI*

IEC 60068-2-75:2014, *Essais d'environnement – Partie 2-75: Essais – Essai Eh: Essais au marteau*

IEC 60112:2009, *Méthode de détermination des indices de résistance et de tenue au cheminement des matériaux isolants solides*

IEC 60212:2010, *Conditions normales à observer avant et pendant les essais de matériaux isolants électriques solides*

IEC 60227-5:2011, *Conducteurs et câbles isolés au polychlorure de vinyle, de tension assignée au plus égale à 450/750 V – Partie 5: Câbles souples*

IEC 60228:2004, *Âmes des câbles isolés*

IEC 60245-4:2011, *Conducteurs et câbles isolés au caoutchouc – Tension assignée au plus égale à 450/750 V – Partie 4: Câbles souples*

IEC 60417, *Symboles graphiques utilisables sur le matériel.* (disponible à l'adresse http://www.graphical-symbols.info/equipment)

IEC 60529:1989, *Degrés de protection procurés par les enveloppes (Code IP)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60669-2-1:2002, *Interrupteurs pour installations électriques fixes domestiques et analogues – Partie 2-1: Prescriptions particulières – Interrupteurs électroniques*
IEC 60669-2-1:2002/AMD1:2008
IEC 60669-2-1:2002/AMD2:2015

IEC 60695-2-10:2000, *Essais relatifs aux risques du feu – Partie 2-10: Essais au fil incandescent/chauffant – Appareillage et méthode commune d'essai*

IEC 60695-2-11:2014, *Essais relatifs aux risques du feu – Partie 2-11: Essais au fil incandescent/ chauffant – Méthode d'essai d'inflammabilité pour produits finis (GWEPT)*

IEC 60998-1:2002, *Dispositifs de connexion pour circuits basse tension pour usage domestique et analogue – Partie 1: Règles générales*

IEC 60998-2-1, *Dispositifs de connexion pour circuits basse tension pour usage domestique et analogue – Partie 2-1: Règles particulières pour dispositifs de connexion en tant que parties séparées avec organes de serrage à vis*

IEC 60998-2-2, *Dispositifs de connexion pour circuits basse tension pour usage domestique et analogue – Partie 2-2: Règles particulières pour dispositifs de connexion en tant que parties séparées avec organes de serrage sans vis*

IEC 60998-2-3, *Dispositifs de connexion pour circuits basse tension pour usage domestique et analogue – Partie 2-3: Règles particulières pour dispositifs de connexion en tant que parties séparées avec organes de serrage à perçage d'isolant*

IEC 60998-2-4, *Dispositifs de connexion pour circuits basse tension pour usage domestique et analogue – Partie 2-4: Règles particulières pour dispositifs de connexion par épissure*

IEC 61032:1997, *Protection des personnes et des matériels par les enveloppes – Calibres d'essai pour la vérification*

ISO 1456:2009, *Revêtements métalliques et autres revêtements inorganiques – Dépôts électrolytiques de nickel, de nickel plus chrome, de cuivre plus nickel et de cuivre plus nickel plus chrome*

ISO 2081:2008, *Revêtements métalliques et autres revêtements inorganiques – Dépôts électrolytiques de zinc avec traitements supplémentaires sur fer ou acier*

ISO 2093:1986, *Dépôts électrolytiques d'étain – Spécifications et méthodes d'essai*