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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CIRCUIT-BREAKERS FOR EQUIPMENT (CBE)

FOREWORD

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This Redline version provides you with a quick and easy way to compare all the changes between this standard and its 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 60934 has been prepared by subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

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

FDIS	Report on voting
23E/1084/FDIS	23E/1104/RVD

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

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

This fourth edition cancels and replaces the third edition published in 2000, Amendment 1:2007 and Amendment 2:2013. This edition constitutes a technical revision.

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

a) clarifications for type testing purposes.

In this standard, the following print types are used:

– Requirements proper: in roman type.
– *Test specifications: in italic type.*
– Explanatory matter: in smaller roman type.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

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CIRCUIT-BREAKERS FOR EQUIPMENT (CBE)

1 Scope ~~and object~~

~~This International Standard is applicable to mechanical switching devices designed as "circuit-breakers for equipment" (CBE) intended to provide protection to circuits within electrical equipment.~~

~~NOTE 1 The term "equipment" includes appliances.~~

~~NOTE 2 The protected components are usually motors, transformers, internal wiring, etc.~~

~~CBEs may have a rated short-circuit capacity higher than that required for overload conditions and may, in addition, have a conditional short-circuit current rating in association with a specified short-circuit protective device (SCPD).~~

~~This standard is also applicable to switching devices for protection of electrical equipment in case of undervoltage and/or overvoltage.~~

~~It is applicable for a.c. not exceeding 440 V and/or d.c. not exceeding 250 V and a rated current not exceeding 125 A.~~

~~This standard covers CBEs which are intended for~~

~~– automatic interruption and non-automatic or automatic resetting;~~

~~– automatic interruption and non-automatic or automatic resetting and manual switching operation.~~

~~It also covers CBE-switches, in which the means for automatic interruption are inhibited or not present by construction (see 3.1.3).~~

~~NOTE 3 This standard may be used as a guiding document for voltages up to 630 V a.c.~~

~~NOTE 4 Requirements for CBEs suitable for isolation are under consideration.~~

~~This standard contains all the requirements necessary to ensure compliance with the operational characteristics required for these devices by type tests.~~

~~It also contains the details relative to test requirements and methods of testing necessary to ensure reproducibility of test results.~~

This document is applicable to mechanical switching devices designed as "circuit-breakers for equipment" (CBE) for household and similar applications. CBEs according to this document are intended to provide protection to circuits within electrical equipment including its components (e.g. motors, transformers, internal wiring). This document covers also CBEs applicable for protection of electrical equipment in case of undervoltage and/or overvoltage. This document also covers CBEs which are suitable for isolation.

NOTE The term "equipment" includes appliances.

CBEs are not applicable for overcurrent protection of wiring installations of buildings.

CBEs according to this document have:

– a rated voltage not exceeding 440 V AC (between phases) and/or DC not exceeding 250 V;

– a rated current not exceeding 125 A;
– a short-circuit capacity (I_{cn}) of at least 6 × I_n (AC types) and 4 × I_n (DC types) but not exceeding 3 000 A.

CBEs may have a conditional short-circuit current (I_{nc}) rating in association with a specified short-circuit protective device (SCPD). A guide for coordination of a CBE associated in the same circuit with a SCPD is given in Annex F.

For CBEs having a degree of protection higher than IP20 according to IEC 60529, for use in locations where hazardous environmental conditions prevail (e.g. excessive humidity, heat or cold or deposition of dust) and in hazardous locations (e.g. where explosions are liable to occur), special constructions may be required.

This document contains all the requirements necessary to ensure compliance with the operational characteristics required for these devices by type tests. It also contains the details relative to test requirements and methods of testing necessary to ensure reproducibility of test results.

This document states:

a) the characteristics of CBEs;
b) the conditions with which CBEs shall comply, with reference to:
    1) their operation and behaviour in normal service;
    2) their operation and behaviour in case of overload;
    3) their operation and behaviour in case of short-circuits up to their rated short-circuit capacity;
    4) their dielectric properties;
c) the tests intended for confirming that these conditions have been met and the methods to be adopted for the tests;
d) the data to be marked on the devices;
e) the test sequences to be carried out and the number of samples to be submitted for certification purposes (see Annex C);
f) the routine tests to be carried out to reveal unacceptable variations in material or manufacture, likely to affect safety (see Annex I).

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 60050(151):1978, *International Electrotechnical Vocabulary (IEV) – Chapter 151: Electrical and magnetic devices*~~

~~IEC 60050(441):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441: Switchgear, controlgear and fuses*~~

~~IEC 60050(604):1987, *International Electrotechnical Vocabulary (IEV) – Chapter 604: Generation, transmission and distribution of electricity – Operation*~~

~~IEC 60050(826):1982, *International Electrotechnical Vocabulary (IEV) – Chapter 826: Electrical installations of buildings*~~
~~Amendment 1 (1990)~~

~~Amendment 2 (1995)~~
~~Amendment 3 (1999)~~

IEC 60060-1:~~1989~~ 2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068-2-20~~:1979~~, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

~~IEC 60099-1:1991, *Surge arresters – Part 1: Non-linear resistor type gapped arresters for a.c. systems* [1)]~~

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

~~IEC 60269 (all parts), *Low-voltage fuses*~~

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

~~IEC 60417-1:1998, *Graphical symbols for use on equipment – Part 1: Overview and application*~~

IEC 60529~~:1989~~, *Degrees of protection provided by enclosures (IP Code)*

~~IEC 60664 (all parts), *Insulation coordination for equipment within low-voltage systems*~~

IEC 60664-1:~~1992~~ 2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3~~:1992~~, *Insulation coordination for equipment within low-voltage systems – Part 3: ~~Use of coatings to achieve insulation coordination of printed board assemblies~~ Use of coating, potting or moulding for protection against pollution*

~~IEC 60695-2-1 (all sheets), *Fire hazard testing – Part 2: Test methods – Section 1: Glow-wire test methods*~~

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

~~IEC 60898:1995, *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations*~~

IEC 60898-1:2015, *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations – Part 1: Circuit-breakers for a.c. operation*

~~IEC 60947-1:1999, *Low-voltage switchgear and controlgear – Part 1: General rules*~~

~~IEC 60950:1999, *Safety of information technology equipment*~~

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

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~~1) There is a consolidated edition 3.1 (1999) that includes IEC 60099-1 (1991) and its amendment 1 (1999).~~

IEC 61000-4-3~~:1995~~, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – ~~Section 3:~~ Radiated, radio-frequency, electromagnetic field immunity test*

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

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

IEC 61000-6-1, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity standard for residential, commercial and light-industrial environments*

~~CISPR 22:1997, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*~~

CISPR 32, *Electromagnetic compatibility of multimedia equipment – Emission requirements*

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~~2) There is a consolidated edition 1.1 (1999) that includes IEC 61000-4-2 (1995) and its amendment 1 (1998).~~

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NORME INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CIRCUIT-BREAKERS FOR EQUIPMENT (CBE)

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International Standard IEC 60934 has been prepared by subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

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

FDIS	Report on voting
23E/1084/FDIS	23E/1104/RVD

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

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

This fourth edition cancels and replaces the third edition published in 2000, Amendment 1:2007 and Amendment 2:2013. This edition constitutes a technical revision.

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

a) clarifications for type testing purposes.

In this standard, the following print types are used:

– Requirements proper: in roman type.
– *Test specifications: in italic type.*
– Explanatory matter: in smaller roman type.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

CIRCUIT-BREAKERS FOR EQUIPMENT (CBE)

1 Scope

This document is applicable to mechanical switching devices designed as "circuit-breakers for equipment" (CBE) for household and similar applications. CBEs according to this document are intended to provide protection to circuits within electrical equipment including its components (e.g. motors, transformers, internal wiring). This document covers also CBEs applicable for protection of electrical equipment in case of undervoltage and/or overvoltage. This document also covers CBEs which are suitable for isolation.

NOTE The term "equipment" includes appliances.

CBEs are not applicable for overcurrent protection of wiring installations of buildings.

CBEs according to this document have:

– a rated voltage not exceeding 440 V AC (between phases) and/or DC not exceeding 250 V;

– a rated current not exceeding 125 A;

– a short-circuit capacity (I_{cn}) of at least 6 × I_n (AC types) and 4 × I_n (DC types) but not exceeding 3 000 A.

CBEs may have a conditional short-circuit current (I_{nc}) rating in association with a specified short-circuit protective device (SCPD). A guide for coordination of a CBE associated in the same circuit with a SCPD is given in Annex F.

For CBEs having a degree of protection higher than IP20 according to IEC 60529, for use in locations where hazardous environmental conditions prevail (e.g. excessive humidity, heat or cold or deposition of dust) and in hazardous locations (e.g. where explosions are liable to occur), special constructions may be required.

This document contains all the requirements necessary to ensure compliance with the operational characteristics required for these devices by type tests. It also contains the details relative to test requirements and methods of testing necessary to ensure reproducibility of test results.

This document states:

a) the characteristics of CBEs;

b) the conditions with which CBEs shall comply, with reference to:

   1) their operation and behaviour in normal service;

   2) their operation and behaviour in case of overload;

   3) their operation and behaviour in case of short-circuits up to their rated short-circuit capacity;

   4) their dielectric properties;

c) the tests intended for confirming that these conditions have been met and the methods to be adopted for the tests;

d) the data to be marked on the devices;

e) the test sequences to be carried out and the number of samples to be submitted for certification purposes (see Annex C);

f) the routine tests to be carried out to reveal unacceptable variations in material or manufacture, likely to affect safety (see Annex I).

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 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

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

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

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

IEC 60898-1:2015, *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations – Part 1: Circuit-breakers for a.c. operation*

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

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

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

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

IEC 61000-6-1, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity standard for residential, commercial and light-industrial environments*

CISPR 32*, Electromagnetic compatibility of multimedia equipment – Emission requirements*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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DISJONCTEURS POUR ÉQUIPEMENT (DPE)

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La Norme internationale IEC 60934 a été établie par le sous-comité 23E: Disjoncteurs et appareillage similaire pour usage domestique, du comité d'études 23 de l'IEC: Petit appareillage.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
23E/1084FDIS	23E/1104/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 internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Cette quatrième édition annule et remplace la troisième édition parue en 2000, l'Amendement 1:2007 et l'Amendement 2:2013. Cette édition constitue une révision technique.

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

a) éclaircissements relatifs à la finalité des essais de type.

Dans le présent document, les caractères d'imprimerie suivants sont employés:

– Exigences proprement dites: caractères romains;
– *Modalités d'essais: caractères italiques*;
– Commentaires: petits caractères romains.

Le comité a décidé que le contenu de ce document 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 au document recherché. À cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

DISJONCTEURS POUR ÉQUIPEMENT (DPE)

1 Domaine d'application

Le présent document est applicable aux appareils mécaniques de connexion désignés sous le nom de "disjoncteurs pour équipement" (DPE) pour applications domestiques et analogues. Selon le présent document, les DPE sont destinés à la protection des circuits internes des équipements électriques, y compris leurs composants (par exemple, les moteurs, les transformateurs, le câblage interne). Le présent document couvre aussi les DPE applicables pour la protection des équipements électriques en cas de sous-tension et/ou de surtension. Le présent document couvre aussi les DPE qui sont aptes au sectionnement.

NOTE Le terme "équipement" couvre aussi les appareils.

Les DPE ne sont pas applicables pour la protection contre les surintensités des installations câblées des immeubles.

Les DPE selon le présent document ont:

– une tension assignée n'excédant pas 440 V en courant alternatif (entre phases) et/ou n'excédant pas 250 V en courant continu;

– un courant assigné n'excédant pas 125 A;

– un pouvoir de coupure (I_{cn}) d'au moins 6 × I_n en courant alternatif et 4 × I_n en courant continu mais n'excédant pas 3 000 A.

Les DPE peuvent avoir des caractéristiques assignées de courant conditionnel de court-circuit (I_{nc}) en association avec un dispositif de protection contre les courts-circuits (DPCC) spécifié. Un guide pour la coordination d'un DPE associé dans le même circuit à un DPCC est donné à l'Annexe F.

Pour les DPE ayant un degré de protection supérieur à IP20, selon l'IEC 60529, lors d'une utilisation dans des endroits où prédominent des conditions d'environnement dangereuses (par exemple, humidité excessive, chaleur ou froid ou encore dépôt de poussière) et dans des endroits dangereux (par exemple, lieux exposés aux explosions), des constructions spéciales peuvent être exigées.

Le présent document comprend toutes les exigences nécessaires pour assurer la conformité aux caractéristiques de fonctionnement exigées pour ces appareils par les essais de type. Elle comprend également les détails relatifs aux exigences et aux modalités d'essais nécessaires pour assurer la reproductibilité des résultats.

Le présent document indique:

a) les caractéristiques des DPE;

b) les conditions auxquelles les DPE doivent satisfaire, en ce qui concerne:

   1) leur manœuvre et leur comportement en service normal;

   2) leur manœuvre et leur comportement en cas de surcharge;

   3) leur manœuvre et leur comportement en cas de court-circuit jusqu'à leur pouvoir de coupure assigné;

   4) leurs propriétés diélectriques;

c) les essais prévus pour confirmer que ces conditions sont satisfaites et les méthodes à adopter pour les essais;

d) les données devant figurer sur les appareils;

e) les séquences d'essais à effectuer et le nombre d'échantillons à soumettre pour la certification (voir Annexe C);

f) les essais individuels de série à effectuer pour déceler les changements inacceptables de matériau ou de fabrication susceptibles de compromettre la sécurité (voir Annexe I).

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 60060-1:2010, *Techniques des essais à haute tension – Partie 1: Définitions et exigences générales*

IEC 60068-2-20, *Essais d'environnement – Partie 2-20: Essais – Essai T: Méthodes d'essai de la brasabilité et de la résistance à la chaleur de brasage des dispositifs à broches*

IEC 60227 (toutes les parties), *Conducteurs et câbles isolés au polychlorure de vinyle, de tension nominale au plus égale à 450/750 V*

IEC 60417, *Graphical symbols for use on equipment* (disponible en anglais seulement à l'adresse: http://www.graphical-symbols.info/equipment)

IEC 60529, *Degrés de protection procurés par les enveloppes (Code IP)*

IEC 60664-1:2007, *Coordination de l'isolement des matériels dans les systèmes (réseaux) à basse tension – Partie 1: Principes, exigences et essais*

IEC 60664-3, *Coordination de l'isolement des matériels dans les systèmes (réseaux) à basse tension – Partie 3: Utilisation de revêtement, d'empotage ou de moulage pour la protection contre la pollution*

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

IEC 60898-1:2015, *Petit appareillage électrique – Disjoncteurs pour la protection contre les surintensités pour installations domestiques et analogues – Partie 1: Disjoncteurs pour le fonctionnement en courant alternatif*

IEC 61000-4-2, *Compatibilité électromagnétique (CEM) – Partie 4-2: Techniques d'essai et de mesure – Essai d'immunité aux décharges électrostatiques*

IEC 61000-4-3, *Compatibilité électromagnétique (CEM) – Partie 4-3: Techniques d'essai et de mesure – Essai d'immunité aux champs électromagnétiques rayonnés aux fréquences radioélectriques*

IEC 61000-4-4, *Compatibilité électromagnétique (CEM) – Partie 4-4: Techniques d'essai et de mesure – Essai d'immunité aux transitoires électriques rapides en salves*

IEC 61000-4-5, *Compatibilité électromagnétique (CEM) – Partie 4-5: Techniques d'essai et de mesure – Essai d'immunité aux ondes de choc*

IEC 61000-6-1, *Compatibilité électromagnétique (CEM) – Partie 6-1: Normes génériques – Norme d'immunité pour les environnements résidentiels, commerciaux et de l'industrie légère*

CISPR 32, *Compatibilité électromagnétique des équipements multimédia – Exigences d'émission*