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Circuit-breakers for equipment (CBE)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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

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- 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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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Circuit-breakers for equipment (CBE)

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IEC 60934:2019-01(en-fr)

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