



SLOVENSKI STANDARD
SIST EN 60934:1996

01-marec-1996

Circuit-breakers for equipment (CBE) (IEC 934:1993, modified)

Circuit-breakers for equipment (CBE)

Geräteschutzschalter (GS)

Disjoncteurs pour équipement (DPE)

Ta slovenski standard je istoveten z: EN 60934:1994/A1:1994

[SIST EN 60934:1996](https://standards.iteh.ai/catalog/standards/sist/4235c3c9-6089-423c-ac00-d27eb077dd1e/sist-en-60934-1996)

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ICS:

29.120.50	Varovalke in druga medtokovna zaščita	Fuses and other overcurrent protection devices
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en

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EUROPEAN STANDARD

EN 60934

NORME EUROPEENNE

EUROPÄISCHE NORM

March 1994

UDC 621.316.57:614.8

Descriptors: Household accessory, low voltage equipment, circuit-breaker, automatic switching device, characteristic, test

ENGLISH VERSION

Circuit-breakers for equipment (CBE)
(IEC 934:1993, modified)

Disjoncteurs pour équipement (DPE)
(CEI 934:1993, modifiée)

Geräteschutzschalter (CBE)
(IEC 934:1993, modifiziert)

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This European Standard was approved by CENELEC on 1993-12-08. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

FOREWORD

The text of document 23E(CO)136, as prepared by Sub-Committee 23E of IEC Technical Committee 23, Electrical accessories, was submitted to the IEC-CENELEC parallel vote in July 1992.

At the request of the CENELEC Technical Committee TC 23E, Circuit breakers and similar devices for household and similar applications, the text of amendment 2:1992 to IEC 934:1988 was submitted to the CENELEC Unique Acceptance Procedure (UAP) in December 1992.

Both documents were approved by CENELEC as amendments to EN 60934:1990, with the decision to await publication of a new edition of IEC 934.

Upon confirmation by the secretary of CLC/TC 23E that the new edition of IEC 934, published in July 1993, was indeed equivalent with the first edition + A1 + A2 + A3, the CENELEC Technical Board approved the text of IEC 934:1993 with the common modifications agreed for the first edition, as EN 60934 on 1993-08-12.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-09-01
- latest date of withdrawal of conflicting national standards (dow) 1994-09-01

For products which have complied with EN 60934:1990 and its amendment A1:1992 before 1994-09-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1999-09-01.

ENDORSEMENT NOTICE

The text of the International Standard IEC 934:1993 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

1 General

1.1 Scope

Add the following at the end of the text:

This standard does not cover CBEs for isolating purposes, for which more stringent requirements are under consideration.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication	Date	Title	EN/HD	Date
50(441)	1984	International Electrotechnical Vocabulary (IEV) - Chapter 441: Switchgear, controlgear and fuses	-	-
112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980
227 (mod)	Series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V	HD 21	Series
269	Series	Low-voltage fuses	EN 60269	Series
529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
664	-	Insulation co-ordination within for equipment within low-voltage systems	-	-
695-2-1	1991*	Fire hazard testing - Part 2: Test methods - Section 1: Glow-wire test and guidance	-	-
898 (mod)	1987	Circuit-breakers for overcurrent protection for household and similar installations	EN 60898	1991

* IEC 695-2-1:1980 was harmonized as HD 444.2.1 S1:1983.

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EUROPEAN STANDARD

EN 60934/A1

NORME EUROPEENNE

EUROPAISCHE NORM

November 1994

UDC 621.316.57:614.8
ICS 29.120.40 29.120.60

Descriptors: Household accessory, low voltage equipment, circuit-breaker,
automatic switching device, characteristic, test

Amendment A1 to the English version EN 60934

Circuit-breakers for equipment (CBE)
(IEC 934:1993/A1:1994)

Disjoncteurs pour équipement
(DPE)
(CEI 934:1993/A1:1994)

Geräteschutzschalter (GS)
(IEC 934:1993/A1:1994)

This amendment A1 modifies the European Standard EN 60934:1994. It was approved by CENELEC on 1994-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

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Ref. No. EN 60934:1994/A1:1994 E

FOREWORD

The text of document 23E(CO)142, as prepared by Sub-Committee 23E: Circuit-breakers and similar equipment for household use, of IEC Technical Committee 23: Electrical accessories, was submitted to the IEC-CENELEC parallel vote in February 1994.

The reference document was approved by CENELEC as amendment A1 to EN 60934 on 1 September 1994 with an editorial modification as indicated by a vertical line in the left margin of the text.

The following dates were fixed:

- latest date of publication of
an identical national standard (dop) 1995-10-01
- latest date of withdrawal of
conflicting national standards (dow) 1995-10-01

Annex C

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Add in table C3 in the boxes of test sequence A the reference to the additional note "h)".

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Add the following note:
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h) When multiple circuit breakers are submitted, a maximum of four screw-type terminals for external conductors are subjected to the tests of 8.5, i.e. two supply and two load terminals.

NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC
934

Deuxième édition
Second edition
1993-07

Disjoncteurs pour équipement (DPE)

Circuit-breakers for equipment (CBE)

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE XB

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

	Page
FOREWORD	5
Clause	
1 General	7
2 Definitions	9
3 Classification	23
4 Characteristics of CBEs	25
5 Marking and other product information	29
6 Standard conditions for operation in service	33
7 Requirements for construction and operation	35
8 Tests	57
Figures	94
ANNEXES	
	SIST EN 60934:1996 https://standards.iteh.ai/catalog/standards/sist/4235c3c9-6089-423c-ac00-d27eb077dd1e/sist-en-60934-1996
A – Time-current zone	100
B – Determination of clearances and creepage distances	103
C – Test sequences and number of samples to be submitted for certification purposes	107
D – Correspondence between ISO and AWG copper conductors	113
E – Example of terminals	114
F – Coordination between a CBE and a short-circuit protective device (SCPD) associated in the same circuit	119

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CIRCUIT-BREAKERS FOR EQUIPMENT (CBE)

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. 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. The 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 the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

International Standard IEC 934 has been prepared by sub-committee 23E, of IEC technical committee 23: Electrical accessories.

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This second edition cancels and replaces the first edition published in 1988 and constitutes a technical revision.

The text of this standard is based on the first edition of 1988, and amendments 1 (1990) and 2 (1992) and on the following documents:

DIS	Report on Voting
23E(CO)136	23E(CO)138

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

Annexes A to E form an integral part of this standard.

Annex F is for information only.

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.

CIRCUIT-BREAKERS FOR EQUIPMENT (CBE)

1 General

1.1 Scope

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

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 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 may be used as a guiding document for voltages up to 630 V a.c.

This standard covers CBEs which are either intended for automatic interruption and non-automatic resetting only, or intended also for performing manual switching operations.

[SIST EN 60934:1996](#)

The term "equipment" includes appliances [standards/sist/4235c3c9-6089-423c-ac00-d27eb077dd1e/sist-en-60934-1996](#)

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

1.2 Object

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.

1.3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(441): 1984; *International Electrotechnical Vocabulary (IEV), Chapter 441: Switchgear, controlgear and fuses*

IEC 112: 1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 227, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 269, *Low-voltage fuses*

IEC 529: 1989, *Degrees of protection provided by enclosures (IP Code)*

IEC 664, *Insulation co-ordination for equipment within low-voltage systems*

IEC 695-2-1: 1991, *Fire hazard testing – Part 2: Test methods – Section 1: Glow-wire test and guidance*

IEC 898: 1987, *Circuit-breakers for overcurrent protection for household and similar installations*

2 Definitions

2.1 Devices

2.1.1 switching device: A device designed to make or break the current in one or more electric circuits.

2.1.2 mechanical switching device: A switching device designed to close and to open one or more electric circuits by means of separable contacts.

2.1.3 fuse: A switching device that, by the melting of one or more of its specially designed and proportioned components, opens the circuit in which it is inserted and breaks the current when this exceeds a given value for a sufficient time.

2.1.4 circuit breaker for equipment (CBE): A mechanical switching device, specifically designed for the protection of equipment, capable of making, carrying and breaking currents under normal conditions and also making, carrying for a specified time and automatically breaking currents under specified abnormal circuit conditions.

Abnormal circuit conditions may be an overcurrent, an undervoltage or an overvoltage.

2.2 General terms

2.2.1 overcurrent: Any current exceeding the rated current.

2.2.2 overload current: An overcurrent occurring in an electrically undamaged circuit.

An overload current may cause damage if sustained for a sufficient time.

2.2.3 short-circuit current: An overcurrent resulting from a fault of negligible impedance between points intended to be at different potentials in normal service.

A short-circuit current may result from a fault or from an incorrect connection.

2.2.4 main circuit (of a CBE): All the conductive parts of a CBE included in the circuit which it is designed to close and open.

2.2.5 control circuit (of a CBE): A circuit (other than a path of the main circuit) intended for the closing operation or opening operation, or both, of the CBE.

2.2.6 auxiliary circuit (of a CBE): All the conductive parts of a CBE intended to be included in a circuit other than the main circuit and the control circuit of the CBE.

2.2.7 pole (of a CBE): That part of a CBE associated exclusively with one electrically separated conducting path of its main circuit provided with contacts intended to connect and disconnect the main circuit itself and excluding those portions which provide a means for mounting and operating the poles together.

2.2.7.1 protected pole: A pole provided with an overcurrent release (see 2.3.6).

2.2.7.2 unprotected pole: A pole without overcurrent release (see 2.3.6) but otherwise generally capable of the same performance as a protected pole of the same CBE.

2.2.7.3 switched neutral pole: A pole, only intended to switch the neutral, and not intended to have a conditional short-circuit capacity.

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2.2.8 closed position: The position in which the predetermined continuity of the main circuit of the CBE is secured.

2.2.9 open position: The position in which the predetermined clearance between open contacts in the main circuit of the CBE is secured.

2.2.10 ambient air temperature: The temperature, determined under prescribed conditions, of the air surrounding the complete CBE (e.g. for an enclosed CBE, it is the air outside the enclosure).

2.2.11 operation: The transfer of the moving contact(s) from the open position to the closed position or vice versa.

If distinction is necessary, an operation in the electrical sense (e.g. make or break) is referred to as a switching operation and an operation in the mechanical sense (e.g. close or open) is referred to as a mechanical operation.

2.2.12 operating cycle: A succession of operations from one position to another and back to the first position.

2.2.13 sequence of operations: A succession of specified operations with specified time intervals.

2.2.14 uninterrupted duty: Duty in which the main contacts of a CBE remain closed whilst carrying a steady current without interruption for long periods (which could be weeks, months, or even years).

2.3 *Constructional elements*

2.3.1 main contact: A contact included in the main circuit of a CBE, intended to carry, in the closed position, the current of the main circuit.

2.3.2 control contact: A contact included in a control circuit of a CBE and mechanically operated by the CBE.

2.3.3 auxiliary contact: A contact included in an auxiliary circuit and mechanically operated by the CBE.

2.3.4 a-contact (make contact): A control or auxiliary contact which is closed when the main contacts of the CBE are closed and open when they are open.

2.3.5 b-contact (break contact): A control or auxiliary contact which is open when the main contacts of the CBE are closed and closed when they are open.

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2.3.6 release: A device, mechanically connected to (or integrated into) a CBE, which releases the holding means and permits the automatic opening of the CBE.

2.3.7 overcurrent release: A release which causes a CBE to open, with or without delay, when the current in the release exceeds a predetermined value.

In some cases, this value can depend upon the rate of rise of current.

2.3.8 Inverse time-delay overcurrent release: An overcurrent release which causes a CBE to open after a time-delay inversely dependent upon the value of the overcurrent.

Such a release may be designed so that the time-delay approaches a definite minimum for high values of overcurrent.

2.3.9 direct overcurrent release: An overcurrent release directly energized by the current in the main circuit of a CBE.

2.3.10 overload release: An overcurrent release intended for protection against overloads.

2.3.11 under-voltage release: A release which causes a CBE to open, with or without delay, when the voltage across the terminals of the release falls below a predetermined value.

2.3.12 over-voltage release: A release which causes a CBE to open, with or without delay, when the voltage across the terminals of the release rises above a predetermined value.