BS EN 60898-1:2019



BSI Standards Publication

Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations

Part 1: Circuit-breakers for a.c. operation

bsi.

National foreword

This British Standard is the UK implementation of EN 60898-1:2019. It is derived from IEC 60898-1:2015. It supersedes BS EN 60898-1:2003+A13:2012, which will be withdrawn on 18 January 2024.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags 〈C〉 〈C〉.

The UK participation in its preparation was entrusted to Technical Committee PEL/23/1, Circuit breakers and similar equipment for household use.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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European foreword

This document (EN 60898-1:2018) consists of the text of IEC 60898-1:2015 prepared by SC 23E “Circuit-breakers and similar equipment for household use” of IEC/TC 23 “Electrical accessories”, together with the common modifications prepared by CLC/TC 23E “Circuit breakers and similar devices for household and similar applications”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-07-18
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2024-05-28

This document supersedes EN 60898-1:2003, EN 60898-1:2003/A1:2004, and EN 60898-1:2003/A12:2008.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60898-1:2015 are prefixed ”Z”.

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

Endorsement notice

The text of the International Standard IEC 60898-1:2015 was approved by CENELEC as a European Standard with agreed common modifications.

Annex ZA
(normative)

Classification of circuit-breakers Type B and C up to and including 63 A into energy limiting classes

Circuit-breakers of B-type and C-type up to and including 63 A, shall be classified into energy limiting classes 1 or 3 in accordance with Table ZA.1 or Table ZA.2, as applicable, and be marked with the number of the energy limiting class in a square adjoining the symbol given in f) of Clause 6.

This classification shall not be applied to circuit-breakers type D and to circuit-breakers with rated current higher than 63 A.

Table ZA.1 – Permissible I^2t (let-through) values for circuit-breakers type B with rated current up to and including 63 A

	Type B				
Rated shortcircuit capacity A	**Class 1**	**Class 3**			
	≤ 63 A	≤ 16 A	20 A, 25 A, 32 A	40 A	50 A, 63 A
3 000	No limits specified	15 000	18 000	21 600	**28 000**
4 500		25 000	32 000	38 400	**48 000**
6 000		35 000	45 000	54 000	**65 000**
10 000		70 000	90 000	108 000	**135 000**

Table ZA.2 – Permissible I^2t (let-through) values for circuit breakers type C with rated current up to and including 63 A

	Type C				
Rated shortcircuit capacity A	**Class 1**	**Class 3**			
	≤ 63 A	≤ 16 A	20 A, 25 A, 32 A	40 A	50 A, 63 A
3 000	No limits specified	**17 000**	**20 000**	**24 000**	**30 000**
4 500		**28 000**	**37 000**	**45 000**	**55 000**
6 000		**40 000**	**52 000**	**63 000**	**75 000**
10 000		**80 000**	**100 000**	**120 000**	**145 000**

The maximum I^2t values measured during the test sequence E1 or E2 as applicable serve as reference values for the classification

Compliance with the requirements of Tables ZA.1 and ZA.2 is checked on the circuit-breakers with the highest rated current available within the range covered by each of these tables.

If these current ratings are not included in the samples submitted to test sequence E_1 or E_2 of Annex C, the appropriate number of samples of these ratings shall be additionally submitted to that test sequence. None of the values measured shall exceed the permissible I^2t value of the proposed energy limiting class in accordance with Tables ZA.1 and ZA.2.

If circuit-breakers rated 40 A are submitted with the range of circuit-breakers with rating exceeding 16 A and their measured I^2t values are lower than those indicated in Table ZA.1 or Table ZA.2 for rating 32 A, no relevant test is necessary for the circuit-breakers rated 32 A.

If circuit-breakers rated 50 A or 63 A are submitted with the range of circuit-breakers with rating exceeding 32 A and their measured I^2t values are lower than those indicated in Table ZA.1 or Table ZA.2 for rating 40 A, no relevant test is necessary for the circuit-breakers rated 40 A.

If circuit-breakers of D-type are submitted with the range of circuit-breakers of type B or type C and their measured I^2t values are lower than those indicated in Table ZA.1 or Table ZA.2 respectively, no relevant test is necessary for the circuit-breakers of type B or type C respectively.

If circuit-breakers of C-type are submitted with the range of circuit-breakers of type B and their measured I^2t values are lower than those indicated in Table ZA.1, no relevant test is necessary for the circuit-breakers of type B.

Annex ZB
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN / HD	Year
IEC 60051	Series	Direct acting indicating analogue electrical measuring instruments and their accessories -	EN 60051	Series
IEC 60112 +A1	2003 2009	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112 +A1	2003 2009
IEC 60227	Series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V	EN 50525	Series
IEC 60228	2004	Conductors of insulated cables	EN 50525	Series
IEC 60269	Series	Low-voltage fuses	EN 60269	Series
IEC 60364-1 (mod)	2005	Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions	HD 60364-1 + A1	2008 2017
IEC 60364-4-41 (mod)	2005	Electrical installations of buildings – Part 4: Protection for safety – Chapter 41: Protection against electric shock	HD 60364-4-41 + A11	2017 2017
IEC 60364-4-43 (mod)	2008	Electrical installations of buildings – Part 4: Protection for safety – Chapter 47: Application of protective measures for safety – Section 473: Measures of protection against overcurrent	HD 60364-4-43	2010
IEC 60417	Datab ase	Graphical symbols for use on equipment. Available from: http://www.graphical-symbols.info/equipment	–	–
IEC 60529 + A1 + A2	1989 1999 2013	Degrees of protection provided by enclosures (IP Code)	EN 60529 + A1 + A2	1991 2000 2013
IEC 60664-1	2007	Insulation co-ordination for equipment within low voltage systems . Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60695-2-10	2013	Fire hazard testing - Part 2–10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure	EN 60695-2-10	2013

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	EN 60695-2-11	2014
IEC 60898-2 +A1 (mod)	2000 2003	Circuit-breakers for overcurrent protection for household and similar installations – Part 2: Circuit-breakers for a.c. and d.c. operation	EN 60898-2	2006
IEC 60947-1	2007	Low-voltage switchgear and controlgear – Part 1 General rules	EN 60947-1	2007
IEC 60947-2	2016	Low-voltage switchgear and controlgear – Part 2 Circuit-breakers	EN 60947-2	2017
IEC 61009-1 +A1 +A2 (mod)	2010 2012 2013	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) – Part 1: General rules	EN 61009-1 +A1 +A2 +A11 +A12	2013 2014 2014 2015 2016
IEC 61009-2-1	1991	Residual current operated circuit-breakers with integral overcurrent protection for household and similar use (RCBO's) – Part 2–1: Applicability of the general rules to RCBO's functionally independent of line voltage	EN 61009-2-1 +A11	1994 1998
IEC 61009-2-2	1991	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) – Part 2–2: Applicability of the general rules to RCBO's functionally dependent on line voltage	–	–
IEC 61545	1996	Connecting devices – Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units	–	-
ISO 2039-2	1987	Plastics – Determination of hardness – Part 2: Rockwell hardness	EN ISO 2039-2	1999
ISO/IEC Guide 2	2004	Standardization and related activities - General vocabulary	–	–

Annex ZC
(normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.

NOTE If it affects harmonization, it forms part of the European Standard or Harmonization Document.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

Clause	Special national condition
J.1	**Austria, Czech Republic, Netherlands, Norway and Switzerland** The upper limit of current for use of screwless terminals is 16 A.
J.3.3	**Austria, Belgium, Denmark, France, Germany, Italy, Portugal, Spain and Sweden** Only universal screwless type terminals are accepted.
K.1	**Belgium, Italy and Spain** The use of circuit-breakers with flat quick-connect terminations for rated currents up to and including 20 A is accepted.
K.8.2.2	**Belgium, Italy and Spain** The use for rated currents up to and including 20 A is accepted.

Annex ZD
(informative)

List of clauses that require retesting

Based on EN 60898-1:2003, A1:2004, A11:2005, A12:2008 and A13:2012, the following tests and/or requirements have been technically modified and may require retesting or inspection as applicable:

— 9.5.2 in 9.5 Tests of reliability of screw-type terminals for external copper conductors;

— 9.7.4 Insulation resistance and dielectric strength of auxiliary circuits;

— 9.10.3 Test of instantaneous tripping, of correct opening of the contacts and of the trip-free function;

— 9.15 Test Resistance to abnormal heat and to fire.

Annex ZZ
(informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Table ZZ.1 – Correspondence between this European standard and Article 3 of Directive 2014/35/EU [2014 OJ L153]

Safety Objectives of Directive 2014/35/EU	Clause(s) / subclause(s) of this EN	Remarks / Notes
(1)(a)	1, 2, 3, 4, 5, 6 – 9.3	
(1)(b)	8.1 – 9.4 and 9.5	
(1)(c)	7 – 9.1 and 9.2, Annex I	
(2) (a)	8.3 – 9.6, 8.5 – 9.9, 8.6 – 9.10, 8.7 - 9.11, 8.8 - 9.12, Annex C	
(2) (b)	8.4 – 9.8, 8.5 – 9.9, 8.6 – 9.10, 8.7 - 9.11, 8.8 – 9.12, Annex C	
(2) (c)	8.14, 8.15	
(2) (d)	8.1.3 – Measure, 8.3 – 9.7	
(3) (a)	8.9 – 9.13, 8.12 – 9.16	
(3) (b)	8.10 – 9.14, 8.11 – 9.15	
(3) (c)	8.6 – 9.10, 8.7 – 9.11, 8.8 – 9.12	

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2: Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL ACCESSORIES – CIRCUIT-BREAKERS FOR OVERCURRENT PROTECTION FOR HOUSEHOLD AND SIMILAR INSTALLATIONS –

Part 1: Circuit-breakers for a.c. operation

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International Standard IEC 60898-1 has been prepared by sub-committee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

This second edition cancels and replaces the first edition published in 2002, Amendment 1:2002 and Amendment 2:2003. This edition constitutes a technical revision.

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

a) Revision of 9.5 Terminals

b) Revision of the test of glow wire

c) Simplification of the figures for short circuit tests.

The text of this standard is based on the following documents:

FDIS	Report on voting
23E/881/FDIS	23E/894/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:

– Requirements proper: in roman type.

– *Test specifications: in italic type.*

– Explanatory matter: in smaller roman type.

A list of all parts in the IEC 60898 series, published under the general title *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar 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.

A bilingual version of this publication may be issued at a later date.

The contents of the corrigendum of November 2015 have been included in this copy.

ELECTRICAL ACCESSORIES – CIRCUIT-BREAKERS FOR OVERCURRENT PROTECTION FOR HOUSEHOLD AND SIMILAR INSTALLATIONS –

Part 1: Circuit-breakers for a.c. operation

1 Scope

This part of IEC 60898 applies to a.c. air-break circuit-breakers for operation at 50 Hz, 60 Hz or 50/60 Hz, having a rated voltage not exceeding 440 V (between phases), a rated current not exceeding 125 A and a rated short-circuit capacity not exceeding 25 000 A.

As far as possible, it is in line with the requirements contained in IEC 60947-2.

These circuit-breakers are intended for the protection against overcurrents of wiring installations of buildings and similar applications; they are designed for use by uninstructed people and for not being maintained.

They are intended for use in an environment with pollution degree 2 〚C〛 and overvoltage category III. 〚C1〛

〚C〛 NOTE 1 Additional requirements are necessary for circuit-breakers used in locations having more severe overvoltage conditions. 〚C〛

They are suitable for isolation.

〚C〛 Circuit-breakers of this standard are suitable for use in IT systems provided that the requirements of HD 60364-4-43 are complied with. 〚C〛

This standard also applies to circuit-breakers having more than one rated current, provided that the means for changing from one discrete rating to another is not accessible in normal service and that the rating cannot be changed without the use of a tool.

This standard does not apply to

– circuit-breakers intended to protect motors;
– circuit-breakers, the current setting of which is adjustable by means accessible to the user.

For circuit-breakers having a degree of protection higher than IP20 according to IEC 60529, for use in locations where arduous 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 standard does not apply to circuit-breakers for a.c. and d.c. operation,which is covered by IEC 60898-2.

This standard does not apply to circuit-breakers which incorporate residual current tripping devices, which is covered by IEC 61009-1, IEC 61009-2-1, and IEC 61009-2-2.

〚C〛 Supplementary requirements may be necessary for circuit-breakers of the screw-in types. 〚C〛

A guide for co-ordination under short-circuit conditions between a circuit-breaker and another short-circuit protective device (SCPDs) is given in Annex D. For more severe overvoltage conditions, circuit-breakers complying with other standards (e.g. IEC 60947-2) should be used.

For an environment with a higher pollution degree, enclosures giving the appropriate degree of protection should be used.