

INTERNATIONAL STANDARD

**Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations –
Part 3: Circuit-breakers for DC operation**

IEC 60898-3:2019

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CONTENTS

FOREWORD.....	9
1 Scope.....	11
2 Normative references	12
3 Terms and definitions	12
3.1 Devices.....	13
3.2 General terms.....	13
3.3 Constructional elements.....	15
3.4 Conditions of operation	18
3.5 Characteristic quantities	19
3.6 Definitions related to insulation co-ordination.....	23
4 Classification.....	25
4.1 General.....	25
4.2 According to the number of poles.....	25
4.3 According to the current direction through the poles.....	25
4.4 According to the protection against external influences.....	26
4.5 According to the method of mounting	26
4.6 According to the methods of connection.....	26
4.6.1 According to the fixation system.....	26
4.6.2 According to the type of terminals.....	26
4.7 According to the instantaneous tripping current (see 3.5.18).....	26
5 Characteristics of circuit-breakers.....	26
5.1 List of characteristics	26
5.2 Rated quantities.....	27
5.2.1 Rated voltages	27
5.2.2 Rated direct current (I_n)	27
5.2.3 Rated short-circuit capacity (I_{cn})	27
5.2.4 Rated making and breaking capacity of an individual pole (I_{cn1})	27
5.3 Standard and preferred values.....	28
5.3.1 Preferred values of rated voltage.....	28
5.3.2 Preferred values of rated current	28
5.3.3 Values of rated short-circuit capacity.....	28
5.3.4 Standard ranges of instantaneous tripping.....	28
5.3.5 Standard value of rated impulse withstand voltage (U_{imp}).....	28
6 Marking and other product information.....	29
7 Standard conditions for operation in service	30
7.1 General.....	30
7.2 Ambient air temperature range.....	30
7.3 Altitude	31
7.4 Atmospheric conditions	31
7.5 Conditions of installation.....	31
7.6 Pollution degree.....	31
8 Requirements for construction and operation.....	31
8.1 Mechanical design	31
8.1.1 General	31
8.1.2 Mechanism	31
8.1.3 Clearances and creepage distances (see Annex A)	33

8.1.4	Screws, current-carrying parts and connections	35
8.1.5	Terminals for external conductors	36
8.1.6	Non-interchangeability	38
8.1.7	Mechanical mounting of plug-in type circuit-breakers	39
8.2	Protection against electric shock	39
8.3	Dielectric properties and isolating capability	39
8.3.1	General	39
8.3.2	Dielectric properties	40
8.3.3	Isolating capability	40
8.3.4	Dielectric strength at rated impulse withstand voltage (U_{imp})	40
8.4	Temperature rise	40
8.4.1	Temperature rise limits	40
8.4.2	Ambient air temperature	40
8.5	Uninterrupted duty	41
8.6	Automatic operation	41
8.6.1	Standard time-current zone	41
8.6.2	Conventional quantities	42
8.6.3	Tripping characteristic	42
8.7	Mechanical and electrical endurance	42
8.8	Performance at short-circuit currents and at small DC currents	43
8.9	Resistance to mechanical shock and impact	43
8.10	Resistance to heat	43
8.11	Resistance to abnormal heat and to fire	43
8.12	Resistance to rusting	43
8.13	Behaviour in case of making inrush current	43
8.14	Power loss	43
8.15	Requirement of small DC currents	44
9	Tests	44
9.1	Type tests and test sequences	44
9.2	Test conditions	45
9.3	Test of indelibility of marking	46
9.4	Test of reliability of screws, current-carrying parts and connections	46
9.5	Tests of reliability of screw-type terminals for external copper conductors	47
9.6	Test of protection against electric shock	49
9.7	Test of dielectric properties	49
9.7.1	Resistance to humidity	49
9.7.2	Insulation resistance of the main circuit	50
9.7.3	Dielectric strength of the main circuit	51
9.7.4	Insulation resistance and dielectric strength of auxiliary circuits	51
9.7.5	Verification of impulse withstand voltages (across clearances and across solid insulation) and of leakage current across open contacts	52
9.8	Test of temperature rise and measurement of power loss	55
9.8.1	Ambient air temperature	55
9.8.2	Test procedure	55
9.8.3	Measurement of the temperature of parts	55
9.8.4	Temperature rise of a part	55
9.8.5	Measurement of power loss	55
9.9	28-day test	56
9.10	Test of tripping characteristic	56

9.10.1	General	56
9.10.2	Test of time-current characteristic.....	56
9.10.3	Test of instantaneous tripping, of correct opening of the contacts and of the trip-free function	56
9.10.4	Test of effect of single-pole loading on the tripping characteristic of multipole circuit-breakers.....	57
9.10.5	Test of effect of ambient temperature on the tripping characteristic	58
9.11	Verification of mechanical and electrical endurance	58
9.11.1	General test conditions	58
9.11.2	Test procedure	58
9.11.3	Condition of the circuit-breaker after test	59
9.12	Short-circuit tests.....	59
9.12.1	General	59
9.12.2	Values of test quantities	60
9.12.3	Tolerances on test quantities	60
9.12.4	Test circuit for short-circuit performance.....	60
9.12.5	Time constant of the test circuits	61
9.12.6	Measurement and verification of I^2t and of the peak current (I_p).....	62
9.12.7	Calibration of the test circuit	62
9.12.8	Interpretation of records	62
9.12.9	Condition of the circuit-breaker for test	62
9.12.10	Behaviour of the circuit-breaker during short-circuit tests.....	64
9.12.11	Test procedure	64
9.12.12	Verification of the circuit breaker after short circuit tests.....	67
9.13	Mechanical stresses	68
9.13.1	Mechanical shock	68
9.13.2	Resistance to mechanical stresses and impact	68
9.14	Test of resistance to heat.....	71
9.15	Resistance to abnormal heat and to fire	72
9.16	Test of resistance to rusting.....	73
9.17	Verification of the behaviour in case of making inrush current.....	73
9.17.1	General	73
9.17.2	Values of the test quantities.....	73
9.17.3	Limit deviations of the test quantities	74
9.17.4	Test circuit for the determination of the withstand capacity against making currents	74
9.17.5	Testing for determination of the withstand capacity against making currents	75
Annex A	(normative) Determination of clearances and creepage distances	87
A.1	General.....	87
A.2	Orientation and location of a creepage distance.....	87
A.3	Creepage distances where more than one material is used.....	87
A.4	Creepage distances split by floating conductive part	87
A.5	Measurement of creepage distances and clearances	87
Annex B	(normative) Test sequences and number of samples necessary to prove compliance with this document	92
B.1	Test sequences	92
B.2	Number of samples to be submitted for full test procedure and acceptance criteria	93
B.3	Number of samples to be submitted for simplified test procedure	94

Annex C (informative) Co-ordination under short-circuit conditions between a circuit-breaker and another short-circuit protective device (SCPD) associated in the same circuit.....	97
C.1 General.....	97
C.2 Purpose.....	97
C.3 General requirements for the co-ordination of a circuit-breaker with another SCPD.....	98
C.3.1 General consideration.....	98
C.3.2 Take-over current.....	98
C.3.3 Behaviour of C_1 in association with another SCPD.....	98
C.4 Type and characteristics of the associated SCPD.....	98
C.5 Verification of selectivity.....	99
C.6 Verification of back-up protection.....	99
C.6.1 Determination of the take-over current.....	99
C.6.2 Verification of back-up protection.....	99
C.6.3 Tests for verification of back-up protection.....	100
C.6.4 Results to be obtained.....	101
Annex D (informative) Examples of terminals.....	105
Annex E (informative) Correspondence between IEC and AWG copper conductors.....	108
Annex F (normative) Arrangement for short-circuit test.....	109
Annex G (normative) Routine tests.....	112
G.1 General.....	112
G.2 Tripping tests.....	112
G.3 Verification of clearances between open contacts.....	112
Annex H (normative) Particular requirements for circuit-breakers with screwless type terminals for external copper conductors.....	113
H.1 Scope.....	113
H.2 Normative references.....	113
H.3 Terms and definitions.....	113
H.4 Classification.....	114
H.5 Characteristics of circuit-breakers.....	114
H.6 Marking and other product information.....	114
H.7 Standard conditions for operation in service.....	114
H.8 Requirements for construction and operation.....	115
H.8.1 Connection or disconnection of conductors.....	115
H.8.2 Dimensions of connectable conductors.....	115
H.8.3 Connectable cross-sectional areas.....	116
H.8.4 Insertion and disconnection of conductors.....	116
H.8.5 Design and construction of terminals.....	116
H.8.6 Resistance to ageing.....	116
H.9 Tests.....	116
H.9.1 Test of reliability of screwless terminals.....	116
H.9.2 Tests of reliability of terminals for external conductors: mechanical strength.....	117
H.9.3 Cycling test.....	118
H.10 Reference documents.....	120
Annex I (normative) Particular requirements for circuit-breakers with flat quick-connect terminations.....	121
I.1 Scope.....	121

I.2	Normative references.....	121
I.3	Terms and definitions.....	121
I.4	Classification	122
I.5	Characteristics of circuit-breakers.....	122
I.6	Marking and other product information	122
I.7	Standard conditions for operation in service.....	122
I.8	Requirements for construction and operation	122
I.8.1	Clearances and creepage distances (see Annex A)	122
I.8.2	Terminals for external conductors	123
I.9	Tests	123
I.9.1	Mechanical overload-force	123
Annex J (normative) Specific requirements for circuit-breakers with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors		
J.1	Scope	128
J.2	Normative references.....	128
J.3	Terms and definitions.....	128
J.4	Classification	129
J.5	Characteristics of circuit-breakers.....	129
J.6	Marking and other product information	129
J.7	Standard conditions for operation in service.....	129
J.8	Constructional requirements	130
J.9	Tests	130
J.9.1	Test conditions	132
J.9.2	Current cycling test.....	132
J.10	Reference documents	137
Bibliography.....		
Figure 1 – Thread forming tapping screw		
		75
Figure 2 – Thread cutting tapping screw		
		75
Figure 3 – Single-pole circuit-breaker or pole of multiple circuit breaker.....		
		75
Figure 4 – Two-pole circuit-breaker with two protected poles		
		76
Figure 5 – Three-pole circuit-breaker with two protected poles and non-polarized protected M pole.....		
		76
Figure 6 – Calibration of the test circuit in case of direct currents		
		77
Figure 7 –Mechanical shock test apparatus (see 9.13.1).....		
		77
Figure 8 – Standard test finger (see 9.6).....		
		78
Figure 9 – Mechanical impact test apparatus (see 9.13.2).....		
		79
Figure 10 – Striking element for pendulum for mechanical impact test apparatus (see 9.13.2).....		
		80
Figure 11 – Mounting support for mechanical impact test (see 9.13.2).....		
		81
Figure 12 – Example of mounting for a rear fixed circuit-breaker for mechanical impact test (see 9.13.2)		
		82
Figure 13 – Example of mounting of a panel board type circuit-breaker for mechanical impact test (see 9.13.2)		
		83
Figure 14 – Application of force for mechanical test on a rail-mounted circuit-breaker (see 9.13.2.4)		
		84
Figure 15 – Ball-pressure test apparatus.....		
		84

Figure 16 – Example of application of force for mechanical test on two-pole plug-in circuit-breaker, the holding in position of which depends solely on the plug-in connections (see 9.13.2.5).....	85
Figure 17 – Diagrammatic representation (see 9.15).....	86
Figure 18 – Impedance Z_1 for test circuit in Figures 3, 4 and 5 for the simulation of making currents	86
Figure A.1 – Examples of methods of measuring creepage distances and clearances.....	91
Figure C.1 – Overcurrent co-ordination between a circuit-breaker and a fuse or back-up protection by a fuse – Operating characteristics	102
Figure C.2 – Total selectivity between two circuit-breakers	103
Figure C.3 – Back-up protection by a circuit-breaker – Operating characteristics	104
Figure D.1 – Examples of pillar terminals.....	105
Figure D.2 – Examples of screw terminals and stud terminals	106
Figure D.3 – Examples of saddle terminals	107
Figure D.4 – Examples of lug terminals.....	107
Figure F.1 – Test arrangement.....	110
Figure F.2 – Grid circuit	111
Figure F.3 – Grid circuit	111
Figure H.1 – Connecting samples	118
Figure H.2 – Examples of screwless-type terminals	120
Figure I.1 – Example of position of the thermocouple for measurement of the temperature rise	124
Figure I.2 – Dimensions of male tabs	125
Figure I.3 – Dimensions of round dimple detents (see Figure I.2).....	126
Figure I.4 – Dimensions of rectangular dimple detents (see Figure I.2)	126
Figure I.5 – Dimensions of hole detents	126
Figure I.6 – Dimensions of female connectors.....	127
Figure J.1 – General arrangement for the test.....	136
Figure J.2	136
Figure J.3	137
Figure J.4	137
Figure J.5	137
Figure J.6	137
Table 1 – Preferred values of rated voltage and corresponding supply systems	28
Table 2 – Ranges of instantaneous tripping	28
Table 3 – Minimum clearances and creepage distances.....	34
Table 4 – Connectable cross-sections of copper conductors for screw-type terminals	37
Table 5 – Temperature rise values	40
Table 6 – Time-current operating characteristics.....	41
Table 7 – Maximum power loss per pole	44
Table 8 – List of type tests	44
Table 9 – Cross-sectional areas (S) of test copper conductors corresponding to the rated currents	46
Table 10 – Screw thread diameters and applied torques	47

Table 11 – Pulling forces	48
Table 12 – Test voltage of auxiliary circuits	52
Table 13 – Test voltage for verification of impulse withstand voltage	54
Table 14 – Test voltage for verifying the suitability for isolation, referred to the rated impulse withstand voltage of the circuit breakers and the altitude where the test is carried out	54
Table 15 – Applicability of tests	60
Table 16 – Ratio k between service short-circuit capacity (I_{CS}) and rated short-circuit capacity (I_{CN}).....	66
Table B.1 – Test sequences.....	92
Table B.2 – Number of samples for full test procedure	94
Table B.3 – Reduction of samples for series of circuit-breakers having different numbers of poles	95
Table B.4 – Test sequences for a series of circuit-breakers being of different instantaneous tripping classifications	96
Table H.1 – Connectable conductors	115
Table H.2 – Cross-sections of copper conductors connectable to screwless-type terminals.....	116
Table H.3 – Pull forces	117
Table I.1 – Informative table on colour code of female connectors in relationship with the cross section of the conductor.....	122
Table I.2 – Overload test forces.....	123
Table I.3 – Dimensions of tabs.....	124
Table I.4 – Dimensions of female connectors.....	127
Table J.1 – Marking for terminals.....	129
Table J.2 – Connectable cross-sections of aluminium conductors for screw-type terminals.....	130
Table J.3 – List of tests according to the material of conductors and terminals.....	131
Table J.4 – Connectable conductors and their theoretical diameters	131
Table J.5 – Cross sections (S) of aluminium test conductors corresponding to the rated currents	132
Table J.6 – Test conductor length	133
Table J.7 – Equalizer and busbar dimensions	133
Table J.8 – Test current as a function of rated current	135
Table J.9 – Example of calculation for determining the average temperature deviation D	135

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 3: Circuit-breakers for DC operation

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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International Standard IEC 60898-3 has been prepared by sub-committee 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/1122/FDIS	23E/1126/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.

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.

In this document, the following print types are used:

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

The following differences exist in the countries indicated below.

- 4.7, Note 2: In China, other ranges of instantaneous tripping defined by the manufacturer are allowed.
- Clause 6, Notes 1 and 2: In the following countries: DK, FI, NO, SE and ZA the marking of the symbol on the circuit-breaker is mandatory to indicate that the device provides isolation for the installation downstream. In Australia this marking on the circuit-breaker is mandatory but is not required to be visible after installation.
- H.1, Note: In CZ, DK, NL, NO and CH, the upper limit of current for use of screwless terminals is 16 A.
- H.3.3, Note 1 to entry: In the following countries only universal screwless type terminals are accepted: AT, BE, CN, DK, DE, ES, FR, IT, PT and SE.
- Clause I.1, Note: The use of circuit-breakers with flat quick-connect terminations for rated currents up to and including 20 A is accepted in BE, FR, IT, ES, PT and US.
- I.8.2.2, Note 1: The use for rated currents up to and including 20 A is accepted in BE, FR, IT, PT, ES and US.
- Clause J.1, Note: In Austria, Australia and Germany, the use of aluminium screw-type terminals for use with copper conductors is not allowed.
- In Austria and Germany, terminals for aluminium conductors only are not allowed.
- In Spain, the use of aluminium conductors is not allowed for final circuits in household and similar installations e.g. offices, shops.
- In Denmark, the minimum cross-sectional area for aluminium conductors is 16 mm².

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.

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

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

Part 3: Circuit-breakers for DC operation

1 Scope

This part of IEC 60898 applies to DC circuit-breakers, having a rated DC voltage not exceeding 440 V, a rated current not exceeding 125 A and a rated short-circuit capacity not exceeding 10 000 A.

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.

They are suitable for isolation.

Circuit-breakers in compliance with this document are suitable for use in TN, TT, and, under specific conditions, IT systems. (standards.iteh.ai)

This document 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 document 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 can be required.

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

This document does not apply to circuit-breakers for AC operation, which is covered by IEC 60898-1.

This document does not apply to circuit-breakers for AC and DC operation, which is covered by IEC 60898-2.

Circuit breakers according to this document have a high resistance against unwanted tripping, regardless whether caused by in-rush currents through loading of electronic loads or by switching operations in the circuit.

NOTE Circuit-breakers within the scope of this document can also be used for protection against electric shock in case of a fault, depending on their tripping characteristics and on the characteristics of the installation. The criterion of application for such purposes is dealt with by installation rules.

This document contains all 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.

Guidance on the coordination, under short-circuit conditions, between a circuit-breaker and another short-circuit protective device (SCPD) is given in Annex C.

Routine tests intended to reveal, as far as safety is concerned, unacceptable variations in material or manufacture are given in Annex G.

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 60050-441, *International Electrotechnical Vocabulary – Switchgear, controlgear and fuses* (available at <http://www.electropedia.org>)

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

IEC 60228:2004, *Conductors of insulated cables*

IEC 60269 (all parts), *Low-voltage fuses* IEC 60898-3:2019
<https://standards.iteh.ai/catalog/standards/sist/b588edfe-6009-4f78-a1e6-f9971baea817/iec-60898-3-2019>

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 co-ordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60695-2-10, *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 60947-2:2016, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-441, and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 Devices

3.1.1

switching device

device designed to make or break the current in one or more electric circuits

[SOURCE: IEC 60050-441:2000, 441-14-01]

3.1.2

mechanical switching device

switching device designed to close and open one or more electric circuits by means of separable contacts

[SOURCE: IEC 60050-441:2000, 441-14-02, modified – The note has been deleted.]

3.1.3

fuse

device that, by the fusing 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

[SOURCE: IEC 60050-441:2000, 441-18-01, modified – The end of the definition has been changed.]

3.1.4

circuit-breaker

mechanical switching device, capable of making, carrying and breaking currents under normal circuit conditions and also making, carrying for a specified time, and automatically breaking currents under specified abnormal circuit conditions such as those of short-circuit

[SOURCE: IEC 60050-441:2000, 441-14-20, modified – "automatically" has been added.]

3.1.5

plug-in circuit-breaker

circuit-breaker having one or more plug-in terminals and designed for use with appropriate means for the plug-in connection

Note 1 to entry: See 3.3.10.8.

3.2 General terms

3.2.1

overcurrent

current exceeding the rated current

[SOURCE: IEC 60050-441:2000, 441-11-06]

3.2.2

overload current

overcurrent occurring in an electrically undamaged circuit

Note 1 to entry: An overload current may cause damage if sustained for a sufficient time.

3.2.3

short-circuit current

overcurrent resulting from a fault of negligible impedance between points intended to be at different potentials in normal service

Note 1 to entry: A short-circuit current may result from a fault or from an incorrect connection.

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