

Electrical accessories — Circuit-breakers and similar equipment for household use — Auxiliary contact units

ICS 29.120.50

National foreword

This British Standard is the UK implementation of EN 62019:1999+A12:2014, including amendments A1:2003 and A11:2005. It is derived from IEC 62019:1999, incorporating amendment 1:2003 and amendment 2:2006. It supersedes BS EN 62019:1999 which will be withdrawn on 4 August 2017.

The start and finish of text introduced or altered by IEC amendment is indicated in the text by tags **A1** **A1**. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 are indicated in the text by **A1** **A1**.

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**. Where a common modification has been introduced by amendment, the tags carry the number of the amendment. For example, the common modifications introduced by CENELEC amendment A11 are indicated by **C11** **C11**.

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

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

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

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English version

Electrical accessories — Circuit-breakers and similar equipment for household use — Auxiliary contact units

(includes amendments A1:2003 and A11:2005)

(IEC 62019:1999 + A1:2002)

Petit appareillage électrique
Disjoncteurs et appareillage
similaire pour usages domestiques
Blocs de contacts auxiliaires
(inclut les amendements A1:2003 et A11:2005)
(CEI 62019:1999 + A1:2002)

Elektrisches Installationsmaterial
Schutzschalter und ähnliche Geräte
für Hausinstallationen — Hilfsschalter
(enthält Änderungen A1:2003 und A11:2005)
(IEC 62019:1999 + A1:2002)

This European Standard was approved by CENELEC on 1999-05-01. Amendment A1 was approved by CENELEC on 2003-02-01. Amendment A11 was approved by CENELEC on 2005-03-1. 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.

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CENELEC

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

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Foreword

The text of document 23E/363/FDIS, future edition 1 of IEC 62019, prepared by SC 23E, Circuit-breakers and similar equipment for household use, of IEC TC 23, Electrical accessories, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62019 on 1999-05-01.

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Annexes designated “normative” are part of the body of the standard.

Annexes designated “informative” are given for information only.

In this standard, Annex A and Annex ZA are normative and Annex B, Annex C and Annex D are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62019:1999 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A1

The text of document 23E/509/FDIS, future amendment 1 to IEC 62019:1999, prepared by SC 23E, Circuit-breakers and similar equipment for household use, of IEC TC 23, Electrical accessories, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 62019:1999 on 2003-02-01.

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- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2006-02-01

Annexes designated “normative” are part of the body of the standard.

Annexes designated “informative” are given for information only.

In this standard, Annex ZA is normative and Annex D is informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of amendment 1:2002 to the International Standard IEC 62019:1999 was approved by CENELEC as an amendment to the European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60664-1 NOTE Harmonized as HD 625.1 S1:1996 (modified).

Foreword to amendment A11

This amendment, aiming to ensure homogeneous application of the short-circuit test procedure in EN 62019:1999, has been prepared by the Technical Committee CENELEC TC 23E, Circuit breakers and similar devices for household and similar applications.

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- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2008-03-01

Foreword to amendment A12

This document (EN 62019:1999/A12:2014) has been 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) 2015-08-04
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2017-08-04

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD – 2006/95/EC).

CONTENTS

1	Scope and object	5
2	Normative references	5
3	Definitions	6
4	Classification	7
5	Characteristics	7
5.1	Type of auxiliary contact unit	7
5.2	Rated values of auxiliary contacts	8
5.3	Performance under normal and abnormal load conditions	8
5.4	Utilization categories of auxiliary contacts	9
5.5	Electrically separated contact elements	9
6	Marking and other information	9
6.1	Marking	9
6.2	Terminal identification	10
6.3	Instructions for installation and operation	10
7	Standard conditions for operation in service	10
8	Requirements for construction and operation	11
8.1	Constructional requirements	11
8.2	Performance requirements	13
8.3	Test device of the auxiliary contact unit	13
8.4	Correct operation of the main switching device	13
8.5	Electromagnetic compatibility	14
9	Tests	14
9.1	Kinds of test	14
9.2	Verification of compliance with constructional requirements	14
9.3	Performance	15
9.4	Tests of creepage distances and clearances for electronic circuits	20
9.5	Requirements for capacitors and specific resistors and inductors used in electronic circuits	22
	Annex A (normative) Determination of clearances and creepage distances	29
	Annex B (informative) Contact rating based on utilization categories	32
	Annex C (informative) Example of inductive loads for tests of d.c. contacts	33
	Annex D (informative) Bibliography	36
	Annex ZA (normative) Normative references to international publications with corresponding European publications	37
	Figure 1 – Examples of contact elements (schematic sketches)	24
	Figure 2 – Test circuits for contact elements	25
	Figure 3 – Circuit for test at conditional short circuit current	26
	Figure 4 – Load details L_d for test conditions requiring different values of make and break currents and/or power factor (time constant)	26

Figure 5 – Minimum creepage distances and clearances measured in millimetres	27
Figure 6 – Minimum creepage distances and clearances as a function of peak value of operating voltage	28
Figures A.1 to A.10 – Illustrations of the application of creepage distances	30
Figure C.1 – Construction of load for d.c. contacts	34
Figure C.2 – Current time limits for d.c. test (loads)	35
Table 1 – Utilization categories for auxiliary contacts	9
Table 2 – Clearances and creepage distances	12
Table 3 – Additional tests for auxiliary contact units already fully tested together with one kind of main switching device	15
Table 4 – Verification of making and breaking capacities of auxiliary contact units under normal conditions according to the utilization categories	18
Table 5 – Verification of making and breaking capacities of auxiliary contact units under abnormal conditions according to the utilization categories	19
Table 6 – Maximum permissible temperatures under abnormal conditions	23
Table B.1 – Examples of contact rating based on utilization categories	32
Table C.1 – D.C. loads	34

**ELECTRICAL ACCESSORIES –
CIRCUIT-BREAKERS AND SIMILAR EQUIPMENT
FOR HOUSEHOLD USE –
AUXILIARY CONTACT UNITS**

1 Scope and object

[A] This International Standard applies to auxiliary electromechanical contact units associated (or intended to be associated) with circuit-breakers for overcurrent protection, and with residual current operated circuit-breakers with or without integral overcurrent protection for household and similar installations, having a rated voltage not exceeding 440 V a.c. and 250 V d.c., and a rated current not exceeding 10 A. **[A]**

NOTE 1 These requirements may also be used as guidance for auxiliary contacts units intended to be assembled with other switching devices for household and similar installations.

NOTE 2 It is recommended that the advice of the manufacturer be sought concerning any application with low level energy appliances (low level values of current and/or voltage.) For low-energy contacts, specific recommendations are given in IEC 60947-5-4.

The object of this standard is to state

- a) the characteristics of the auxiliary contact units;
- b) their electrical and mechanical requirements with respect to
 - 1) the various duties to be performed;
 - 2) the significance of the rated characteristics and of the markings;
 - 3) the tests to verify the rated characteristics;
- c) the functional requirements to be satisfied by the auxiliary contact units with respect to
 - 1) environmental conditions, including those of enclosed equipment;
 - 2) dielectric properties;
 - 3) terminals;
 - 4) safety of use.

2 Normative references

The following referenced documents are indispensable for the application 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):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441: Switchgear, controlgear and fuses*

IEC 60065:1998, *Audio, video and similar apparatus – Safety requirements*

[A] IEC 60112:1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions* **[A]**

IEC 60249-2 (all specifications), *Base materials for printed circuits – Part 2: Specifications*

IEC 60384-14:1993, *Fixed capacitors for uses in electronic equipment – Part 14. Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

IEC 60617 (all parts), *Graphical symbols for diagrams*

IEC 60664-3:1992, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating to achieve insulation coordination of printed board assemblies*

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

IEC 60998-2-2:1991, *Connecting devices for low voltage circuits for household and similar purposes – Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units*

IEC 60947-5-1:1997, *Low-voltage switchgear and controlgear – Part 5: Control circuit devices and switching elements – Section one: Electromechanical control circuit devices*

IEC 60947-5-4:1996, *Low-voltage switchgear and controlgear – Part 5: Control circuit devices and switching elements – Section 4: Methods of assessing the performance of low-energy contacts. Special tests*

IEC 61008-1:1996, *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – Part 1: General rules*

IEC 61009-1:1996, *Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) – Part 1: General rules*

IEC 61210:1993, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

ISO 306:1994, *Plastics – Thermoplastic materials – Determination of Vicat softening temperature (VST)*

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1

auxiliary contact

contact included in an auxiliary circuit and mechanically operated by the switching device [IEV 441-15-10]

3.2

auxiliary contact unit

unit containing one or more control and/or auxiliary contacts mechanically operated by a main switching device

NOTE The main switching device may be a circuit-breaker, RCCB, RCBO, switch, etc.

3.3

A1 contact element (of an auxiliary contact)

all the structural parts, fixed and movable, conducting or insulating, of an auxiliary contact necessary to close and open one single current path of the auxiliary contact unit (IEV 441-15-23 modified) A1

NOTE The contact element and the actuating system may form an indivisible unit, but frequently one or more contact elements may be combined with one or more actuating system(s).

3.4

mini-gap contact element

A1 contact element having a distance equal to, or higher than, 1,2 mm in the open position, but not in compliance with item 1 of table 2 A1

A1 3.5

normal gap contact element

contact element having a distance complying with item 1 of table 2 in the open position A1

4 Classification

Contact elements may be classified as follows.

4.1 According to the utilization categories (see table 1 of 5.4)

4.2 According to the electrical ratings based on utilization categories (see table 4)

4.3 According to one of the following constructions (see figure 1)

4.3.1 Form A – Single-gap make-contact element

4.3.2 Form B – Single-gap break-contact element

4.3.3 Form C – Single-gap make-break three terminal change-over contact element

4.3.4 Other types (see note 1)

4.4 According to the suitability for PELV and SELV circuits

NOTE 1 Other types are described in figure 1. (See also clause 3 and figure 4 of IEC 60947-5-1).

NOTE 2 Distinction is made between make before break (overlap) change-over contact elements where the two circuits are both closed for a part of the travel of the moving contacts from one position to the other, and break before make (non-overlap) change-over contact elements where the two circuits are both open for a part of the travel of the moving contacts from one position to the other. Unless otherwise stated, change-over contact elements are break before make.

A1 4.5 According to the type of contact gap

4.5.1 Normal gap (see 3.5)

4.5.2 Mini-gap (see 3.4) A1

5 Characteristics

5.1 Type of auxiliary contact unit

For the type of auxiliary contact unit, the following shall be stated:

A1 a) form of the contact element (see figure 1);

b) current: a.c. and/or d.c.;

c) number of electrically separated current paths. A1

5.2 Rated values of auxiliary contacts

The rated values of auxiliary contacts shall be stated in accordance with 5.2.1 to 5.2.3.

5.2.1 Rated voltages

An auxiliary contact is defined by the following rated voltages.

5.2.1.1 Rated operational voltage (U_e)

A rated operational voltage of an auxiliary contact is a value of voltage which, combined with a rated operational current, determines the application of the auxiliary contact unit and to which the relevant tests and the utilization categories are referred.

5.2.1.2 Rated insulation voltage (U_i)

[A₁] The rated insulation voltage of an auxiliary contact is the value of voltage, assigned by the manufacturer, to which dielectric test voltages, clearances and creepage distances are referred.

Unless otherwise stated, the rated insulation voltage is the value of the maximum rated voltage of the auxiliary contact. In no case shall the maximum rated voltage exceed the rated insulation voltage. **[A₁]**

5.2.2 Rated operational current (I_e)

The rated operational current(s) of an auxiliary contact is (are) stated by the manufacturer and take(s) into account the relevant values of the rated operational voltage and the rated frequency, the kind of current, and the utilization category.

5.2.3 Rated frequency

The supply frequency for which an auxiliary contact is designed and to which the other characteristic values correspond.

NOTE The same auxiliary contact may be rated for both a.c. and d.c and be assigned a number or a range of rated frequencies.

5.3 Performance under normal and abnormal load conditions

5.3.1 Making and breaking capacities under normal conditions

An auxiliary contact shall comply with the requirements given in table 4 corresponding to the assigned utilization category under normal conditions.

For an auxiliary contact to which a utilization category is assigned, it is not necessary to specify separately a making and breaking capacity.

5.3.2 Making and breaking capacities under abnormal conditions

An auxiliary contact shall comply with the requirements given in table 5 corresponding to the assigned utilization category under abnormal conditions.

Abnormal conditions may be due, for example, to a blocked open electromagnet or a blocked motor.

5.3.3 Rated conditional short-circuit current

The rated conditional short-circuit current of an auxiliary contact is the value of prospective current stated by the manufacturer which the auxiliary contact, protected by a short-circuit protective device (SCPD) specified by the manufacturer, can withstand satisfactorily for the operating time of the SCPD under the specified short-circuit conditions.

5.4 Utilization categories of auxiliary contacts

The standardized utilization categories are given in table 1.



Table 1 – Utilization categories for auxiliary contacts

Kind of current	Category	Typical application
Alternating current	AC-12	Control of resistive loads
	AC-13	Control of solid state loads with transformer isolation
	AC-14	Control of small electromagnetic loads ≤ 72 VA
	AC-15	Control of electromagnetic loads > 72 VA
Direct current	DC-12	Control of resistive loads
	DC-13	Control of electromagnets
	DC-14	Control of electromagnetic loads having economy resistors in circuit



Examples of contact ratings according to utilization categories are given in annex B.

5.5 Electrically separated contact elements

The manufacturer shall state whether or not the contact elements of an auxiliary contact unit are electrically separated.

NOTE Electrically separated contact elements (see IEC 441-15-24) are contact elements belonging to the same auxiliary contact unit, but are adequately insulated from each other so that they can be connected into electrically separated circuits (for example, downstream of an isolating transformer, with SELV or PELV supply).

6 Marking and other information

6.1 Marking

Auxiliary contact units shall be marked with

- a) manufacturer's name or trade mark;
- b) catalogue number.

Furthermore, the following indications shall either be marked on the device or given in the manufacturer's instruction sheet:

- c) utilization category, for example AC-14;
- d) rated operational voltage(s) (U_e);
- e) rated operational current(s) (I_e);
- f) rated conditional short-circuit current, if less than 1 000 A;
- g) type and maximum ratings of short-circuit protective device;

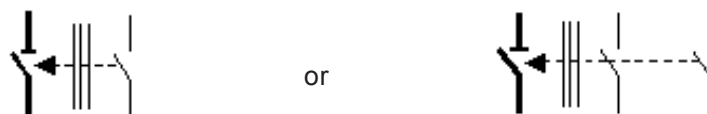
[A1] h) rated frequency (or frequencies) (see 5.2.3), if different from 50/60 Hz;

- i) symbol "m" for mini-gap construction, if applicable;
- j) wiring diagram, unless the correct mode of connection is evident;
- k) degree of protection, if different from IP20;
- l) kind of change-over element, if applicable: make before break (overlap) or break before make (non-overlap).

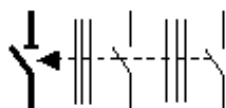
The following information, when relevant, shall be marked on the device and given in the manufacturer's instructions:

m) a symbol showing the suitability for use in SELV and PELV circuits by ensuring adequate insulation:

- between the main switch and the auxiliary contact unit;



- between the main switch and the auxiliary contact unit and between each path of the auxiliary unit



Marking on the device shall be indelible and easily legible, and shall not be placed on screws and removable washers. **[A1]**

6.2 Terminal identification

Terminals shall be clearly and permanently identified in accordance with IEC 60445.

The protective earth terminal shall be identified by the symbol

6.3 Instructions for installation and operation

The manufacturer shall specify in his literature the conditions, if any, for installation and operation of the auxiliary contact unit.

The manufacturer shall declare in his literature the range of operational currents according to the range of operational voltages.

7 Standard conditions for operation in service

The relevant clause of the standard of the main switching device applies, for example

- a) clause 7 of IEC 60898 for circuit-breakers;
- b) clause 7 of IEC 61008-1 for RCCBs;
- c) clause 7 of IEC 61009-1 for RCBs.

8 Requirements for construction and operation

8.1 Constructional requirements

8.1.1 Screws, current-carrying parts and connections

The relevant subclause of the standard of the main switching device applies, for example

- a) 8.1.4 of IEC 60898 for circuit-breakers;
- b) 8.1.4 of IEC 61008-1 for RCCBs;
- c) 8.1.4 of IEC 61009-1 for RCBOs.

8.1.2 Terminals for external conductors

The relevant subclause of the standard of the main switching device applies, for example

- a) 8.1.5 of IEC 60898 for circuit-breakers;
- b) 8.1.5 of IEC 61008-1 for RCCBs;
- c) 8.1.5 of IEC 61009-1 for RCBOs.

[A1] If types or sizes of terminals are used, which are not considered in the standard of the main switching device a), b) or c), generic standards for terminals shall apply (for example, IEC 60998 series IEC 61210). **[A1]**

8.1.3 Clearances and creepage distances (see annex A)

Clearances and creepage distances, with the exception of 8.1.4, shall not be less than the values shown in table 2 on the device mounted as in normal use.

8.1.4 Clearances and creepage distances for electronic circuits connected between active conductors or between active conductors and the earth

For electronic circuits connected between active conductors, or between active conductors and the earth circuit when the contacts are in the closed position, the verification of the clearances and creepage distances is replaced by the tests of 9.4 and 9.5.