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Responsible committee: PEL/23/1 Circuit breakers and similar equipment for household use

Interested committees:

Title: Draft BS EN 60898-1 Amendment 1 Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations Part 1: Circuit-breakers for a.c. operation

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Introduction

This draft standard is based on international discussions in which the UK has taken an active part. Your comments on this draft are welcome and will assist in the preparation of the consequent standard. There is a high probability that this text could be adopted by CENELEC as a reference document for harmonization or as a European Standard. Recipients of this draft are requested to comment on the text bearing in mind this possibility.

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Please indicate whether you consider the UK should submit a negative (with reasons) or positive vote on this draft.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	(7)
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/ Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



23E/1054/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:

IEC 60898-1/AMD1 ED2

DATE OF CIRCULATION:

2018-06-08

CLOSING DATE FOR COMMENTS:

2018-08-31

SUPERSEDES DOCUMENTS:

23E/1041/CD, 23E/1050/CC

IEC SC 23E : CIRCUIT-BREAKERS AND SIMILAR EQUIPMENT FOR HOUSEHOLD USE

SECRETARIAT:

Italy

SECRETARY:

Mr Giovanni Cassinelli

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 64, SC 121A

PROPOSED HORIZONTAL STANDARD:



Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☐ EMC

☐ ENVIRONMENT

☐ QUALITY ASSURANCE

☒ SAFETY

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Part 1: Circuit-breakers for a.c. operation

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1 Scope

Replace in the third paragraph "for not being maintained" by "do not require maintenance".

Add after 10th paragraph the following:

This standard does not apply to circuit-breakers for DC operation, which are covered by IEC 60898-3

3 Definition

Insert a new definition

3.2.15 type test

Test of one or more devices made to a certain design to show that the design meets certain requirements

[SOURCE: IEC 60050-411:1996, 411-53-01, modified]

3.5.14.2

Replace the text by the following:

[SOURCE: IEC 60947-2:2006/AMD2:2013, 2.17.1, modified – "in series" has been added]

3.5.16

Replace "to trip" by "to operate"

5.1 List of characteristics

Replace in the references the following:

– range of instantaneous tripping current (see 4.6 and 5.3.5);

– I^2t classification (see 4.7).

5.2.4 Rated short circuit capacity (I_{cn})

Replace in the note Table 17 by Table 18.

5.3.1 Preferred value of rated voltage

Delete note 1 in the table and renumber the other notes accordingly.

8 Requirements for construction and operation**8.1 Mechanical design**

Replace Clause 8.1.3 by the following new Clauses:

8.1.3 Clearances and creepage distances

The minimum required clearances and creepage distances are given in Table 4 which is based on the circuit-breaker being designed for operating in an environment with pollution degree 2.

The insulating materials are classified into material groups on the basis of their comparative tracking index (CTI) according to IEC 60664-1.

NOTE 1 The comparative tracking index (CTI) is declared by the manufacturer on the basis of tests carried out on the insulating material.

NOTE 2 Information on the requirements for design of solid insulation is provided in IEC 60664-1.

NOTE 3 For clearances on printed wiring material, the following Note 3 Table F.2 in 60664-1:2007 can be used. For creepage distances on printed wiring material, distances in Table F.4 in 60664-1:2007 can be used if protected with a coating meeting IEC 60664-3 requirements and tests.

8.1.3.1 Clearances

Compliance for item 1 in Table 4 is checked by measurement and by the tests of 9.7.5.4.

Compliance for item 2 and 4 in Table 4 is checked by measurement or by the tests of 9.7.5.2.
The test is carried out with samples not submitted to the humidity treatment described in 9.7.1

The clearances of items 2 and 4 (except accessible surface after installation, see Note) may be reduced provided that the measured clearances are not shorter than the minimum allowed in IEC 60664-1 for homogenous field conditions. In this case, compliance for items 2 and 4 is always checked by the test of 9.7.5.2.

NOTE Accessible surface after installation means any surface accessible by the user when the circuit-breaker is installed according to the manufacturer's instructions. The test finger can be applied to determine whether a surface is accessible or not.

Compliance for item 3 in Table 4 is checked by measurement.

8.1.3.2 Creepage distances

Compliance for item 1, 2, 3 and 4 is checked by measurement

NOTE All measurements required in 8.1.3 are carried out in Test sequence A on one sample. Tests according to 9.7.2 to 9.7.5 are carried out in Test sequence B on three samples.

8.1.3.3 Solid insulation

Compliance is checked by the tests according to 9.7.2, 9.7.3, 9.7.4 and 9.7.5 as applicable.

8.1.4.4

Replace in the last paragraph "parts of electronic devices" by "electronic components, including printed circuit board"

8.1.5.1

Replace in the last paragraph "in the standard" by "in this standard"

8.1.5.12

Replace "of the tapping screw type" by "the thread cutting type"

8.1.7.1 General

Replace "the holding of which" by "the retention of which"

8.1.7.2 Plug-in type circuit-breakers, the holding in position of which does not depend solely on their plug-in connection(s)

Replace in the title "the holding of which" by "the retention of which"

8.1.7.3 Plug-in type circuit-breakers, the holding in position of which depends solely on their plug-in connection(s)

Replace in the title "the holding of which" by "the retention of which"

8.4.1 Temperature rise limits

Replace "temperature rise" by "temperature-rise"

9.2 Test conditions

Add at the of point b) the following text:

provided that all poles of the circuit breakers are loaded.

9.3 Test of indelibility of marking

Add after the first paragraph:

Alternately the following solvent could be used: n-hexane 95 % (Chemical Abstracts Service Registry Number CAS RN: 110-54-3).

NOTE n-hexane 95 % (Chemical Abstracts Service Registry Number CAS RN: 110-54-3) is available from a variety of chemical suppliers as a highpressure liquid chromatography (HPLC) solvent.

Only mandatory markings of clause 6 are subjected to this test.

Add in the second paragraph the word “laser” after “moulding”

9.5.1

Replace “These last tests” by “The tests of 9.4 and 9.5”

9.5.2

Replace in the second and third paragraphs “terminal” by “terminals”

9.5.3

Replace in the third paragraph “severed wires” by “severed strands”

Replace the existing 9.7 by the new proposal.

9.7 Test of dielectric properties

9.7.1 Resistance to humidity

9.7.1.1 Preparation of the circuit-breaker for test

Parts which can be removed without the aid of a tool are removed and subjected to the humidity treatment with the main part; spring lids are kept open during this treatment.

Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.

9.7.1.2 Test conditions

The humidity treatment is carried out in a humidity cabinet containing air with a relative humidity maintained between 91 % and 95 %.

The temperature of the air in which the sample is placed is maintained within ± 1 °C of any convenient value T between 20 °C and 30 °C.

Before being placed in the humidity cabinet, the sample is brought to a temperature between T and T +4 °C.

9.7.1.3 Test procedure

The sample is kept in the cabinet for 48 h.

NOTE 1: A relative humidity between 91 % and 95 % can be obtained by placing in the humidity cabinet a saturated solution of sodium sulphate (Na_2SO_4) or potassium nitrate (KNO_3) in water having a sufficiently large contact surface with the air.

NOTE 2: In order to achieve the specified conditions within the cabinet it is necessary to ensure constant circulation of the air within and, in general, to use a cabinet which is thermally insulated.

9.7.1.4 Condition of the circuit-breaker after the test

After this treatment, the sample shall show no damage within the meaning of this standard and shall withstand the tests of 9.7.2, 9.7.3, 9.7.4, and 9.7.5.2.

9.7.2 Insulation resistance of the main circuit

The circuit-breaker having been treated as specified in 9.7.1 is then removed from the cabinet.

After an interval between 30 min and 60 min following this treatment, the insulation resistance is measured 5 s after application of a DC voltage of approximately 500 V, in the following order:

- a) with the circuit-breaker in the open position, between each pair of the terminals which are electrically connected together when the circuit-breaker is in the closed position, in turn on each pole;

b) with the circuit-breaker in the closed position, in turn between each pole and the others connected together, electronic components connected between current paths being disconnected for the test;

c) with the circuit-breaker in the closed position, between all poles connected together and the frame, including a metal foil or part in contact with the outer surface of the housing of insulating material but with the terminal areas kept completely free to avoid flashover between terminals and the metal foil;

d) for circuit-breakers with a metal enclosure having an internal lining of insulating material, between the frame and a metal foil in contact with the inner surface of the lining of insulating material including bushings and similar devices.

The measurements a), b) and c) are carried out after having connected all auxiliary circuits to the frame.

The term "frame" includes:

- all accessible metal parts and a metal foil in contact with the surfaces of insulating material which are accessible after installation as for normal use;
- the surface on which the base of the circuit-breaker is mounted, covered, if necessary, with a metal foil;
- screws and other devices for fixing the base to its support;
- screws for fixing covers which have to be removed when mounting the circuit-breaker,
- metal parts of operating means referred to in 8.2.

If the circuit-breaker is provided with a terminal intended for the interconnection of protective conductors, this terminal is connected to the frame.

For the measurements according to b), c) and d) , the metal foil is applied in such a way that the sealing compound, if any, is effectively tested.

The insulation resistance shall be not less than

- 2 MΩ for the measurements according to items a) and b);
- 5 MΩ for the other measurements.

9.7.3 Dielectric strength of the main circuit

After the circuit-breaker has passed the tests of 9.7.2 the test voltage specified is applied for 1 min between the parts indicated in 9.7.2.

The test voltage shall have practically sinusoidal waveform, and a frequency between 45 Hz and 65 Hz.

The source of the test voltage shall be capable of supplying a short-circuit current of at least 0,2 A.

No overcurrent tripping device of the transformer shall operate when the current in the output circuit is lower than 100 mA.

The values of the test voltage shall be as follows:

- 2 000 V for items a) to c) of 9.7.2;
- 2 500 V for item d) of 9.7.2;

Initially, not more than half the prescribed voltage is applied, then it is raised to the full value within 5 s.

No flashover or breakdown shall occur during the test.

Glow discharges without drop in the voltage are neglected.

9.7.4 Insulation resistance and dielectric strength of auxiliary circuits

Insulation resistance and dielectric strength shall be verified according to a, b and c.