SLOVENSKI STANDARD
SIST EN 61009-1:2013

01-februar-2013

Nadomešča:
SIST EN 61009-1:2005
SIST EN 61009-1:2005/A11:2008
SIST EN 61009-1:2005/A12:2009
SIST EN 61009-1:2005/A13:2009
SIST EN 61009-1:2005/A14:2012
SIST EN 61009-1:2005/A14:2012/AC:2013

Odklopniki na preostali (residualni) tok z vgrajeno nadtokovno zaščito za gospodinjsko in podobno rabo (RCBO's) - 1. del: Splošna pravila (IEC 61009-1:2010, spremenjen)

Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules (IEC 61009-1:2010, modified)

Fehlerstrom-/Differenzstrom-Schutzschalter mit eingebautem Überstromschutz (RCBOs) für Hausinstallationen und für ähnliche Anwendungen -- Teil 1: Allgemeine Anforderungen (IEC 61009-1:2010, modifiziert)

Interrupteurs automatiques à courant différentiel résiduel avec dispositif de protection contre les surintensités incorporé pour usages domestiques et analogues (DD) - Partie 1: Règles générales(CEI 61009-1:2010, modifiée)

Ta slovenski standard je istoveten z: **EN 61009-1:2012**

ICS:

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

SIST EN 61009-1:2013 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61009-1

December 2012

ICS 29.120.50

Supersedes EN 61009-1:2004 + corr. Jul.2006 + A11:2008 + A12:2009 + A13:2009 + A14:2012 + AC:2012

English version

Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules

(IEC 61009-1:2010, modified)

Interrupteurs automatiques à courant différentiel résiduel avec dispositif de protection contre les surintensités incorporé pour usages domestiques et analogues (DD) - Partie 1: Règles générales

(CEI 61009-1:2010, modifiée)

Fehlerstrom-/Differenzstrom-Schutzschalter mit eingebautem Überstromschutz (RCBOs) für Hausinstallationen und für ähnliche Anwendungen - Teil 1: Allgemeine Anforderungen

(IEC 61009-1:2010, modifiziert)

This European Standard was approved by CENELEC on 2012-06-18. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 61009-1:2012 E

Foreword

This document (EN 61009-1:2012) consists of the text of IEC 61009-1:2010 prepared by IEC/TC 23E "Circuit-breakers and similar equipment for household use", 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)	2013-06-18
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2017-06-18

This document supersedes EN 61009-1:2004 + corr.Jul.2006 + A11:2008 + A12:2009 + A13:2009 + A14:2012 + AC:2012.

– complete revision of EMC sequences, including the new test T.2.6, already approved in EN 61543;

– clarification of RCDs current/time characteristics reported in Tables 2 and 3;

– revision of test procedure for $I_{\Delta n}$ between 5 A and 200 A;

– tests for the use of RCBOs in IT systems;

– testing procedure regarding the 6mA d.c. current superimposed to the fault current;

– improvement highlighting RCDs with multiple sensitivity;

– some alignments with EN 60898-1.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] 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.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 61009-1:2010 are prefixed “Z”.

Endorsement notice

The text of the International Standard IEC 61009-1:2010 was approved by CENELEC as a European Standard with agreed common modifications.

COMMON MODIFICATIONS

Clause	Common modification
1	Add in the first paragraph “for fixed installations” after “125 A”. Delete in the first paragraph “with rated frequencies of 50 Hz, 60 Hz or 50/60 Hz” and “for operation at 50 Hz or 60 Hz” Add after ”They are intended for use in an environment with pollution degree 2”, “and overvoltage category III”. Delete in the second paragraph after note 6: “, with the exception of those with an uninterrupted neutral,” Delete after note 7 “It also applies to RCBOs 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.“ Modify the third paragraph after note 7 by “Particular requirements are necessary for RCBOs : - integrated in one unit with a socket-outlet or designed exclusively for being associated locally with a socket-outlet in the same mounting box - if intended to be used at frequencies other than 50 Hz or 60 Hz“ Replace Note 8 by the following sentence in the core text of the scope: “ For RCBOs incorporated in, or intended only for association with socket-outlets, the requirements of this standard may be used in conjunction with the requirements of IEC 60884-1 or national requirements of the country where the product is placed on the market”. Delete notes 9 and 10.
2	Replace the text of Clause 2 by: NOTE Normative references to international publications are listed in Annex ZA (normative).
3.3.16	Modify by “void”
3.3.17	Replace "current paths" by "poles".
3.3.Z.1	Add the following new definition: **3.3.Z1** **plug-in RCBO** RCBO having one or more plug-in terminals (see 3.6.Z1) and designed for use with appropriate means for the plug-in connection
3.4.19.1	Modify twice “current paths” by “poles”
3.6.Z1	Add the following new definition: **3.6.Z1** **plug-in terminal** terminal the electrical connection and disconnection of which can be effected without displacing the conductors of the corresponding circuit. The connection is effected without the use of a tool and is provided by the resilience of the fixed and/or moving parts and/or by springs
4	Delete the number “12” in the first paragraph.
4.1	Replace the note by the following specification: The selection of the various types is made according to HD 60364 and non-conflicting national wiring rules. Table Z1 lists the types of RCBOs according to the various applications but does not exclude the use of RCBOs of any classification for protection over and above that required by the relevant wiring rules.

<table>
<tr><th>Clause</th><th>Common modification</th></tr>
<tr><td>4.1</td><td>Add the following table at the end :
Table Z1 – Survey of the types of RCBOs according to their method of operation
<table>
<tr><td>Classification</td><td>4.1.1</td><td>4.1.2.2a)</td><td>4.1.2.1 b)</td><td>4.1.2.2b)</td></tr>
<tr><td>Marking of use</td><td>Without</td><td>E1</td><td>E2</td><td>E3</td></tr>
<tr><td>Protection</td><td>Indirect contact and additional protection[a]</td><td>Indirect contact and additional protection[a]</td><td>Additional protection[a]</td><td>Additional protection[a b]</td></tr>
<tr><td>Service continuity [c]</td><td>Yes</td><td>Yes</td><td>No</td><td>Yes</td></tr>
<tr><td colspan="5">[a] Additional protection, provided only by RCBOs with $I_{\Delta n} \leq 0{,}03$ A.
[b] Only devices integrated in one unit with a socket-outlet or designed exclusively for being associated locally with a socket outlet in a same mounting box.
[c] This information is given for guidance only.</td></tr>
</table></td></tr>
<tr><td>4.1.2.1</td><td>Replace a) by “a) deleted”</td></tr>
<tr><td>4.1.2.2 a)</td><td>Replace the final sentence in brackets by "(additional requirements are under consideration)".</td></tr>
<tr><td>4.1.2.2 b)</td><td>Delete the note.</td></tr>
<tr><td>4.2</td><td>Replace the text by "Deleted".</td></tr>
<tr><td>4.3</td><td>Delete:
– single-pole RCBO with one overcurrent protected pole and uninterrupted neutral (see 3.3.16) (two current paths)
– three-pole RCBO with three overcurrent protected poles and uninterrupted neutral (four current paths).</td></tr>
<tr><td>4.4</td><td>Replace the text by 'Deleted'</td></tr>
<tr><td>4.10</td><td>Replace the existing subclause title and text by the following new subclause:

4.10 According to the methods of connection

4.10.1 According to the fixation system:

- RCBO’s, the electrical connections of which are not associated with the mechanical mounting;

- RCBO’s, the electrical connections of which are associated with the mechanical mounting.

NOTE Examples of this type are:
– plug-in type;
– bolt-on type;
– screw-in type.
Some RCBO’s may be of the plug-in type or bolt-on type on the line side only, the load terminals being usually suitable for wiring connection.

4.10.2 According to the type of terminals:

– RCBO’s with screw-type terminals for external copper conductors;
– RCBO’s with screwless type terminals for external copper conductors;

NOTE 1 The requirements for RCBO’s equipped with this type of terminals are given in Annex ZE.
– RCBO’s with flat quick-connect terminals for external copper conductors;
NOTE 2 The requirements for RCBO’s equipped with this type of terminals are given in Annex ZF.</td></tr>
</table>

<table>
<tr><th>Clause</th><th>Common modification</th></tr>
<tr><td>4.12</td><td>Replace the text by:
RCBOs of B-type and C-type, having rated current up to and including 63 A and having short-circuit breaking capacity of 3 000 A, 4 500 A, 6 000 A and 10 000 A, shall be classified according to the limits within which their I²t characteristics lie, measured according to 9.12.6 (see Annex ZD).
Other ratings and D-type RCBOs cannot be classified according to this Annex ZD.</td></tr>
<tr><td>4.Z.1</td><td>Add the following new subclause:
4.Z1 According to the range of ambient air temperature
– RCBOs for use at ambient air temperatures between -5 °C and +40 °C;
– RCBOs for use at ambient air temperatures between -25 °C and +40 °C.</td></tr>
<tr><td>5.1</td><td>Delete the first dashed item.</td></tr>
<tr><td>5.1</td><td>Add the following item to the list of common characteristics:
– ranges of ambient air temperature (see 5.3.Z1)</td></tr>
<tr><td>5.2.1.3</td><td>Replace “Table 5” by 5.3.10</td></tr>
<tr><td>5.2.3</td><td>Delete second and third paragraphs of 5.2.3.</td></tr>
<tr><td>5.2.7</td><td>Add a note :
NOTE the corresponding rated quantity of circuit-breaker is the rated making and breaking capacity of an individual pole Icn1 (see 5.2.5 of EN 60898-1:2002).
Replace the last line by:
The conditions are those specified in 9.12.11.4d)</td></tr>
<tr><td>5.3.1</td><td>Replace "preferred" by "standard" (twice).</td></tr>
<tr><td>5.3.1</td><td>Replace the table by the following:
<table><tr><th>RCBO</th><th>Rated voltage of RCBOs for use in systems
230 V, 230 V/400 V, 400V</th></tr><tr><td rowspan="2">Two-pole</td><td>230 V</td></tr><tr><td>400 V</td></tr><tr><td>Three-pole</td><td>400 V</td></tr><tr><td>Four-pole</td><td>400 V</td></tr></table>
Delete the note.</td></tr>
<tr><td>5.3.2</td><td>Delete in the second line the value 8 A.</td></tr>
<tr><td>5.3.3</td><td>Delete the value “0,006”.
Delete the note.</td></tr>
<tr><td>5.3.3</td><td>Add 1A to the standard values.</td></tr>
<tr><td>5.3.5</td><td>Replace the title by "Value of rated frequency".
Replace the text by:
The preferred value of rated frequency is 50 Hz.</td></tr>
<tr><td>5.3.6</td><td>Replace the subclause title by:
5.3.6 Values of rated short-circuit capacity (I_{cn}) and of rated residual making and breaking capacity ($I_{\Delta m}$)</td></tr>
<tr><td>5.3.6.1</td><td>Replace the first sentence by:
Standard values of rated short-circuit capacity and of rated residual making and breaking capacity are given in Table 1. The values of I_{cn} and $I_{\Delta m}$ may be different on the same product.</td></tr>
<tr><td>5.3.6.1</td><td>Replace Table 1 and the subsequent footnote by:
Table 1 - Standard values of rated short-circuit capacity and of the rated residual making and breaking capacity
<table><tr><td>1 500 A (*)</td></tr><tr><td>3 000 A</td></tr><tr><td>4 500 A</td></tr><tr><td>6 000 A</td></tr><tr><td>10 000 A</td></tr></table>(*) Only for RCBOs integrated in one unit with a socket outlet or designed exclusively for being associated locally with a socket outlet in the same mounting box.</td></tr>
<tr><td>5.3.7</td><td>Delete 5.3.7 and replace by “Void”</td></tr>
</table>

Clause	Common modification
5.3.8.1	In Table 2 Modify “Minimum non operating times” by” Minimum non-actuating times“ Delete the note.
5.3.9	Delete “a)” and “a For special cases values up to 50 I_n may also be used.”
5.3.10	Change contents of 5.3.10 to Standard value of the rated impulse voltage (U_{imp}) is 4 kV. NOTE 1 For test voltages to check the insulation see 9.20. NOTE 2 For test voltages to check the isolation distance across open contacts see Table 18.
5.3.Z1	Add the following new subclause: **5.3.Z1 Standard ranges of ambient air temperature** The standard ranges of ambient air temperature are: – -5 °C to +40 °C – -25 °C to +40 °C
6.Z.1	**Replace** the whole subclause by: **6.Z1 Standard marking** Each RCBO shall be marked in a durable manner according to the following Table Z3. For RCBOs other than those operated by means of push-button, the open position shall be indicated by the symbol "O" and the closed position by the symbol "|" (a short straight line). Additional national symbols are allowed for this indication. Provisionally the use of national indications only is allowed. These indications shall be readily visible when the RCBO is installed. For RCBOs operated by means of two push-buttons, the push-button designed for the opening operation only shall be RED and/or be marked with the symbol "O". RED shall not be used for any other push-button of the RCBO. If a push-button is used for closing the contacts and is evidently identified as such, its depressed position is sufficient to indicate the closed position. If a single push-button is used for closing and opening the contacts and is identified as such, the button remaining in its depressed position is sufficient to indicate the closed position. On the other hand, if the button does not remain depressed, an additional means indicating the position of the contacts shall be provided. If it is necessary to distinguish between the supply and the load terminals, they shall be clearly marked (e.g. by "line" and "load" placed near the corresponding terminals or by arrows indicating the direction of power flow). Terminals exclusively intended for the connection of the neutral circuit shall be indicated by the letter N. Terminals intended for the protective conductor, if any, shall be indicated by the symbol  (IEC 60417-5019 a)). NOTE The symbol  (IEC 60417-5017 a)), previously recommended, shall be progressively superseded by the preferred symbol IEC 60417-5019 a), given above. If a degree of protection higher than IP20 is marked on the device, it shall comply with it, whichever the method of installation. If the higher degree of protection is obtained only by a specific method of installation and/or with the use of specific accessories (e.g. terminal covers, enclosures, etc.), this shall be specified in the manufacturer's literature The suitability for isolation, which is provided by all RCBOs of this standard, may be indicated by the symbol on the device. When affixed, this marking may be included in a wiring

Clause	Common modification
	diagram, where it may be combined with symbols of other functions, (e.g. overload protection, or other symbols of IEC TC 3). When the symbol is used on its own (i.e. not in a wiring diagram), combination with sym bols of other functions is not allowed. The base for plug-in RCBOs shall be marked with the following: - rated current or maximum rated current; - trade mark. Marking shall be indelible, easily legible and not be placed on screws, washers or other removable parts. Compliance is checked by inspection and by the test of 9.3.
6.Z.2	Add the following subclause **6.Z2 Additional marking** Additional marking to other standards (EN or IEC or other) or additional requirements are allowed under the following conditions: - the RCBO shall comply with all the requirements of the additional standard; - the relevant standard to which the additional marking refers shall be indicated adjacent to this marking and shall be clearly differentiated or separated from the standard marking according to 6.Z1. *Compliance is checked by inspection and by carrying out all the test sequences required by the relevant standard. Equivalent or less severe test sequences need not be repeated.* **Table Z3 – Requirements for marking** Secretary note : see the table at the end of this document
7.1	In Table 6, second column, add to "-5° C to +40 °C" in the same box, the range "-25 °C to +40 °C 2)”. Modify footnote 7) to read: 7) Extreme limits of -20 °C and 60°C, for RCBOs for use in the range of –5 °C to +40 °C and of –35 °C and 60 °C, for RCBOs for use in the range of –25 °C to +40 °C, are admissible during storage and transportation. These conditions should be taken into account in the design of the device.
7.1	In Table 6, second column, after "2 000 m", add a footnote reference "8)" Add footnote 8) as follows: 8) For installations at higher altitudes, it is necessary to take into account the reduction of the dielectric strength and of the cooling effect of the air. RCBOs intended to be so used shall be designed specially or used according to an agreement between manufacturer and user. Information given in the manufacturer's catalogue may take the place of such an agreement.
8.1.1	Delete in the third paragraph “other than those specifically intended for changing the setting of the residual operating current”. Delete the first sentence of fourth paragraph. Delete last paragraph.
8.1.2	Modify Note 1 by “Note 1: deleted”.
8.1.2	Delete the paragraph “In the case of RCBOs…” and the note 3.
8.1.2	Delete note 4
8.1.3	In second paragraph, add “in addition” after “and” and before “for item 1” In third paragraph, replace “2, 4 and 5” by “2 and 4” In fifth paragraph, replace “2.7.1.1” by “4.8.1.1” and “2.7.1.3” by “4.8.1.3”. Modify Table 7 in deleting columns 2 and 3 and deleting item 5 (in the first column).

<table>
<tr><th>Clause</th><th>Common modification</th></tr>
<tr><td></td><td>

Add in item 2 of Table 7 the reference to footnote j).

Modify table note 2 by:
“The parts of the neutral pole, if any, are considered to be live parts.

Replace table note 3 by “Note 3: deleted”.

Modify table note c by:

“Including a metal foil in contact with the surfaces of insulating material which are accessible after installation for normal use. The foil is pushed into corners, grooves, etc., by means of a straight jointed test finger according to 9.6 (see Figure 3).

Add the following new footnote j) in Table 7:
j) This applies also to clearance and creepage distances between live parts of different polarity of the RCBO and equipments mounted close to it.

</td></tr>
<tr><td>8.1.5.1</td><td>

Delete the second paragraph and the relevant note.

Add at the end of last paragraph “*for screw-type terminals, by specific tests for plug-in or bolt-on RCBO’s included in the standard, or by the tests of Annex ZE or ZF, as relevant for the type of connection”*

</td></tr>
<tr><td>8.1.5.2</td><td>Delete the note in Table 8 which refers to AWG</td></tr>
<tr><td>8.1 .Z1</td><td>

Add the following new subclause:

8.1.Z1 Mechanical mounting of plug-in type RCBOs

The mechanical mounting of plug-in type RCBOs shall be reliable and have adequate stability.

8.1.Z1.1 Plug-in type RCBOs, the holding in position of which does not depend solely on their plug-in connection(s)

Compliance of the mechanical mounting is checked by the relevant tests of 9.13.

Add the following new subclause:

8.1.Z1.2 Plug-in type RCBOs, the holding in position of which depends solely on their plug-in connection(s)

Compliance of the mechanical mounting is checked by the relevant tests of 9.13.

</td></tr>
<tr><td>8.5.2.1</td><td>

Table 10, replace test d by :

<table>
<tr><td>d</td><td>B

C

D</td><td>3 I_n

5 I_n

10 I_n</td><td>Cold a</td><td>0,1 < t < 45 s ($I_n \leq 32$ A)
0,1 < t < 90 s ($I_n > 32$ A)

0,1 < t < 15 s ($I_n \leq 32$ A)
0,1 < t < 30 s ($I_n > 32$ A)

0,1 < t < 4 s b ($I_n \leq 32$ A)
0,1 < t < 8 s ($I_n > 32$ A)</td><td>Tripping</td><td>Current established by closing an auxiliary switch</td></tr>
</table>

</td></tr>
</table>

Clause	Common modification
8.5.2.1	Table 10, test e, delete “b”
8.5.2.1	Table 10, replace contents of note b by: “For $I_n \leq 10$ A, t < 8 s is permitted.”
8.5.2.Z1	**Add** the following new subclause: **8.5.2.Z1 Effect of single phase loading of multi-pole RCBO on the tripping characteristic** Single phase loading of RCBO with more than 2 current paths shall not have a significant effect on the overcurrent tripping characteristic. *Compliance is checked by the tests of 9.9.2.Z1.*
8.11	Delete the third paragraph: "In the case of RCBOs having ... shall be used."
8.11	*Replace the 3rd paragraph by the following*: For RCBOs with rated residual current of 30 mA the ampere-turns produced when operating the test device of a RCBO, supplied at rated voltage or at the highest value of the voltage range, if applicable, shall not exceed 1,66 times the ampere-turns produced, when a residual current equal to $I_{\Delta n}$ is passed through one of the poles of the RCBO. For RCBOs with rated residual currents other than 30 mA the ampere-turns produced when operating the test device of a RCBO, supplied at rated voltage or at the highest value of the voltage range, if applicable, shall not exceed 2,5 times the ampere-turns produced, when a residual current equal to $I_{\Delta n}$ is passed through one of the poles of the RCBO.
8.12	Replace in the first paragraph “current paths” by “poles”.
8.13	**Delete** this subclause and **replace** it by "Void".
8.Z1	Add the following new subclause: **8.Z1 Behaviour of RCBOs at low ambient air temperatures** RCBOs for use in the range of –25 °C to +40 °C (see 4.Z1) shall operate reliably at low temperatures. *Compliance is checked by the tests of 9.Z1.*
9.1.1	Add the following note before Table 12: NOTE To verify compliance of additional marking to 6.Z2, if any, tests are carried out according to the relevant standard. In Table 12 replace the fifth dash by: - Dielectric properties and isolating capability In Table 12 add the following dashed item: - Behaviour at low ambient air temperatures of RCBOs classified for use in the range of -25 °C to +40 °C and add correspondingly "9.Z1" in the column named "Subclause".
9.1.1	**Delete** in Table 12 the row concerning 9.18.
9.1.2	Modify first paragraph by: “*For the purpose of verification of conformity with the standard, type tests are carried out in test sequences.”* Replace the note by: “NOTE Verification of the conformity to the standards may be made – by the manufacturer for the purpose of suppliers declaration (13.5.1 of ISO/IEC Guide 2); – by an independent body for certification (13.5.2 of ISO/IEC Guide 2). According to the terminology of ISO/IEC Guide 2 the term "certification" can be used

Clause	Common modification
	for the second case only."
9.2	Delete the note after Table 13.
9.7	Amend the title to read: **9.7 Test of dielectric properties and isolating capability**
9.7.2	In the second line of Item b) replace "current paths" by poles". Add after b): NOTE To this purpose samples specially prepared by the manufacturer should be submitted to the test sequences implying this test.
9.7.2	Modify dash c) by c) with *the RCBO 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 in an appropriate manner to avoid flashover between terminals and the metal foil;*
9.7.2	**Delete** item d). **Rename** item e) as item d). **Modify** the beginning of the last but one paragraph as follows: "For the measurements according to items b), c) and d), ..."
9.7.3	In the first paragraph, delete *"electronic components, if any, being disconnected for the test.".* Replace the first dashed lines by *– 2 000 V for a) to c) of 9.7.2, electronic components, if any, having been disconnected for test b) (see relevant note on 9.7.2 b);* *– 2 500 V for d) of 9.7.2.*
9.7.7.1	Modify in the 9th paragraph "Table 5" by "5.3.10" Delete in Table 18 the line beginning with "2,5"
9.7.7.2	Modify in the 10th paragraph "Table 5" by "5.3.10" Delete in Table 19 the line beginning with "2,5
9.9.1.1	Delete in the third paragraph "*shall be at least of Class 0.5 and"*
9.9.1.2	Delete the second paragraph.
9.9.1.3	Add a note after the second paragraph: NOTE Preheating may be carried out at reduced voltage but auxiliary circuit shall be connected to their normal operating voltage (particularly for components depending on line voltage)
9.9.1.3	Delete last paragraph
9.9.1.4	Delete the last paragraph before the note.
9.9.1.2 d)	Add at the end of first paragraph "among the following list : 5A – 10A – 20A – 50A – 100A – 200A".
9.9.2.2	Amend the title to read: **9.9.2.2 Test of instantaneous tripping and of correct opening of the contacts**
9.9.2.2 a)	Modify a) by: a) *General test conditions* *For the lower values of the test current of 9.9.2.2 b), 9.9.2.2 c) and 9.9.2.2 d) respectively the test is made once, at any convenient voltage.* *For the upper value of the test current, the two following tests are carried out:* *At any convenient voltage, one opening operation on each combination of two poles connected in series is performed. The tripping time is measured and shall be within the limits of Table 10.*

Clause	Common modification
	At rated voltage U_0 (phase to neutral) with a power factor between 0,95 and 1 separately on each protected pole of the RCBO, the following sequence of operation is performed *O-t-CO-t-CO-t-CO* *the interval t being as defined in 9.12.11.1. The tripping time of the O operation is measured. After each operation the indicating means shall show the open position of the contacts.*
9.9.2.Z1	**Add** the following new subclause: **9.9.2.Z1 Test of effect of single phase loading on the over-current tripping characteristic of RCBO with three or four current paths** This test does not apply to RCBOs obtained by the assembly of an adaptable residual current unit on a circuit-breaker complying with EN 60898-1. *RCBOs with three or four current paths are loaded on 2 current paths. Where a switched neutral pole exists, the test circuit shall include the neutral pole. The test current having the value of 1,2 times the conventional tripping current is applied, starting from cold.* *Except for the neutral pole if applicable, the test is carried out on different poles for each sample.* *The RCBO shall trip within the conventional times as for test b according to Table 10.*
9.10.2	Delete the note.
9.10.3	Replace the last sentence of the second paragraph by: *One test only is made, on one pole taken at random, with measurement of break time: the latter shall not exceed the value specified in Table 2 at $I_{\Delta n}$.*
9.11.2	Delete note 2.
9.12.1	Delete the note after the first paragraph.

<table>
<tr><th>Clause</th><th>Common modification</th></tr>
<tr><td>9.12.1</td><td>Replace Table 20 by

<table>
<tr><th>Kind of test</th><th>RCBOs to be tested</th><th>Verification according to subclause</th></tr>
<tr><td>Test at rated making and breaking capacity on one pole (9.12.13.1)</td><td>All RCBOs</td><td>9.12.12.2</td></tr>
<tr><td>Test at reduced short-circuit currents (9.12.11.2.1)</td><td>All RCBOs</td><td>9.12.12.1</td></tr>
<tr><td>Test to verify suitability for IT systems (9.12.11.2.2)</td><td>All RCBOs</td><td>9.12.12.1</td></tr>
<tr><td>Tests at 1500 A (9.12.11.3)</td><td>All RCBOs</td><td>9.12.12.1</td></tr>
<tr><td>Test at rated residual making and breaking capacity (9.12.11.4 d)</td><td>All RCBOs</td><td>9.12.12.2</td></tr>
<tr><td>Tests at service short-circuit capacity (9.12.11.4 b)</td><td rowspan="2">RCBOs with Icn > 1 500 A</td><td>9.12.12.1</td></tr>
<tr><td>Tests at rated short-circuit capacity(9.12.11.4.c)</td><td>9.12.12.2</td></tr>
</table>

</td></tr>
<tr><td>9.12.2</td><td>Amend the first paragraph and all the dashes to read:

Figures 7 and 11 give diagrams of the circuits to be used for the tests concerning:

– a two-pole RCBO (with one or two overcurrent protected poles) ;
– a three-pole RCBO;
– a four-pole RCBO (with three or four overcurrent protected poles).

Replace in third paragraph “resistor R1” by “resistor r”.

Replace second paragraph after the note by:
A resistor R_2 of about 0,5 Ω is connected in series with a copper wire F as shown in Figures 7 and 11, as applicable.

Replace in sixth paragraph after the note “current sensors O_1 are “ by “current sensors I_1,I_2 and I_3 are”.
Replace in seventh paragraph after the note “voltage sensors O_2 are “ by “voltage sensors U_{r1} , U_{r2} and U_{r3} are”.</td></tr>
<tr><td>9.12.2</td><td>Replace in the 1st paragraph after note “9.12.13” by “9.12.11.4 d)”</td></tr>
</table>

Clause	Common modification
9.12.2	Delete the first dash: - across the terminals of the pole for single-pole RCBOs
9.12.3	Replace in the third paragraph "105 %" by "110 %". Replace in the note "105 % (± 5 %) by "110 % (0, - 5 %)".
9.12.4	Replace, in the last line, "± 5 %" by "0, - 5%".
9.12.7.1, 9.12.7.3 and 9.12.7.4	In 9.12.7.1, 9.12.7.3 and 9.12.7.4, replace “in Figures 8 to 12” by “in Figures 7 and 11”.
9.12.8	Replace "Figure 13" by "Figure Z4" in both 9.12.8.a) and 9.12.8.b).
9.12.9.1	Amend to read after note 1: *The grid circuit(s) (see Figure C.3) shall be connected to the points B and C as shown in the test circuit diagrams of Figures 7 and 11.*
9.12.9.2	*Amend to read in the note:* NOTE This means that if other RCBOs (or other devices) are normally fitted in the direction(s) in which the grid(s) would be placed, they should be installed in that position. These RCBOs (or other devices) should be supplied as in normal use, but via F' and R' as defined in 9.12.9.1 and connected as shown in the appropriate Figures 7 and 11.
9.12.11.2.1	Amend second paragraph to read : “ *“Each overcurrent protected pole of the RCBO is subjected separately to a test in a circuit the principle of connections of which are shown in Figure 11. Phases which do not carry the short circuit current during this test shall be connected to the supply voltage at the line terminals.* Add after second paragraph: *“The measurement of the breaking time shall be carried out at every test and the values shall comply with the values of Table 2.”* Delete the note.
9.12.11.2.2	Modify end of first paragraph from “*105 % of the rated phase to phase voltage value”* to “*105 % of 400 V.”* Modify “Uo” in the second paragraph by “230 V”.
9.12.11.2.2	Delete the note
9.12.11.3	Delete the third paragraph. Amend the paragraph beginning with “Three-pole RCBOs” to read: *Three-pole RCBOs and four-pole RCBOs with three overcurrent protected poles are tested in a circuit the diagram of which is shown in Figure 11.* Delete the paragraph beginning with “For three-pole RCBOs…”. Delete in the ninth paragraph "single-pole and".
9.12.11.4	Delete in b) 2) "single-pole and". Delete in the title of Table 23 "single- and".
9.12.11.4	Add a new 9.12.11.4 d): *d) Test at the residual making and breaking capacity $I_{\Delta m}$* *The test circuit is calibrated according to 9.12.7.* *The test is carried out on one pole taken at random which shall not be the switched neutral or the overcurrent unprotected pole. This pole is connected according to the diagram of Figure 11.* *In addition phases which do not carry the short-circuit current during this test shall be connected to their supply voltage at the corresponding terminals.*