

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

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

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



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2012 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.

Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

Useful links:

IEC publications search - www.iec.ch/searchpub

The advanced search enables you to find IEC publications by a variety of criteria (reference number, text, technical committee,...).

It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available on-line and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary (IEV) on-line.

Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Liens utiles:

Recherche de publications CEI - www.iec.ch/searchpub

La recherche avancée vous permet de trouver des publications CEI en utilisant différents critères (numéro de référence, texte, comité d'études,...).

Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

Just Published CEI - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications de la CEI. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (VEI) en ligne.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

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

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE **XA**
CODE PRIX

ICS 29.120.50

ISBN 978-2-83220-018-6

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

FOREWORD

This amendment has been prepared by subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

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

FDIS	Report on voting
23E/740/FDIS	23E/744/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

iTeh STANDARD PREVIEW

The contents of the corrigendum of May 2016 have been included in this copy.

(standards.iteh.ai)

[IEC 61008-1:2010/AMD1:2012](https://standards.iteh.ai/catalog/standards/sist/30c222b2-07e5-4def-a270-fff4972d666/iec-61008-1-2010-amd1-2012)

<https://standards.iteh.ai/catalog/standards/sist/30c222b2-07e5-4def-a270-fff4972d666/iec-61008-1-2010-amd1-2012>

1 Scope

Delete Note 5 and replace it by the following paragraph and new Note 5:

For RCCBs incorporated in, or intended only for association with socket-outlets, the requirements of this standard may be used, as far as applicable, in conjunction with the requirements of IEC 60884-1 or the national requirements of the country where the product is placed on the market.

NOTE 5 RCCBs incorporated in, or intended only for association with socket-outlets, can either meet IEC 62640 or this standard.

2 Normative references

Delete the reference to IEC 60051.

Add to the existing list, the following new references:

IEC 60228:2004, *Conductors of insulated cables*

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution*

Replace the reference to IEC 61543:1995 by the following new reference:

IEC 61543:1995, *Residual current-operated protective devices (RCDs) for household and similar use – Electromagnetic compatibility*

Amendment 1(2004)
Amendment 2 (2005)

4.10 According to the method of connection

In this subclause, replace the existing text and note by the following:

- RCCBs, the electrical connections of which are not associated with the mechanical mounting;
- RCCBs, 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 RCCBs 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.

Add the following new subclause:

4.11 According to the type of terminals:

- RCCBs with screw-type terminals for external copper conductors;
- RCCBs with screwless type terminals for external copper conductors;

NOTE 1 The requirements for RCCBs equipped with this type of terminals are given in Annex J.

- RCCBs with flat quick-connect terminals for external copper conductors;

NOTE 2 The requirements for RCCBs equipped with these types of terminals are given in Annex K.

- RCCBs with screw-type terminals for external aluminium conductors;

NOTE 3 The requirements for RCCBs equipped with these types of terminals are under consideration.

Table 1 – Limit values of break time and non-actuating time for alternating residual currents (r.m.s values) for type AC and A RCCB

Replace, in this Table, the word “non-operating” by “non-actuating”.

Table 3 – Rated impulse withstand voltage as a function of the nominal voltage of the installation

Replace, in Note 2, “see Table 15” by “see Table 22”.

Replace, in table footnote a), “(see Tables 5 and 15)” by “(see Tables 5 and 22)”.

6 Marking and other product information

Replace the contents of item k) by the following:

- k) the position of use, if necessary;

Replace in the twelfth paragraph after Note 1, the word “circuit” by “conductor”

Add the following text at the end of Clause 6:

For universal terminals (for rigid-solid, rigid-stranded and flexible conductors):

- no marking.

For non-universal terminals:

- terminals declared for rigid-solid conductors only shall be marked by the letters “s” or “sol”;
- terminals declared for rigid (solid and stranded) conductors only shall be marked by the letter “r”.

The markings should appear on the RCCB or, if the space available is not sufficient, on the smallest package unit or in technical information.

8.1.3 Clearances and creepage distances (see Annex B)

Replace the existing text of this subclause by the following:

The minimum required clearances and creepage distances are given in Table 5 which is based on the RCCB being designed for operating in an environment with pollution degree 2.

Compliance for item 1 in Table 5 is checked by measurement and by the test of 9.7.7.4.1 and 9.7.7.4.2. The test is carried out with samples not submitted to the humidity treatment described in 9.7.1.

The clearances of items 2, 4 and 5 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, after the humidity treatment described in 9.7.1, compliance for items 2, 4 and 5 and arrangements of 9.7.2 items b), c), d) and e) is checked in the following order:

- Tests according to 9.7.2 to 9.7.6 as applicable,
- Test according to 9.7.7.2 is applied with test voltages given in Table 16 with test arrangements of 9.7.2 items b), c), d), e).

If measurement does not show any reduced clearance, test in 9.7.7.2 is not applied.

Compliance for item 3 in Table 5 is checked by measurement.

NOTE 1 All measurements required in 8.1.3 are carried out in Test sequence A on one sample and the tests of 9.7.7.2 are carried out before 9.7.1 on three samples of Test sequence B.

Parts of PCBs connected to the live parts protected against pollution by the use of a type 2 protection according to IEC 60664-3 are exempt from this verification.

The insulating materials are classified into material groups on the basis of their comparative tracking index (CTI) according to 4.8.1 of IEC 60664-1:2007.

NOTE 2 Information on the requirements for design of solid insulation and appropriate testing is provided in IEC 60664-1:2007, 5.3 and 6.1.3.

NOTE 3 For clearances on printed wiring material, the following Note 3 Table F.2 in 60664-1:2007 can be used: “For printed wiring material, the values for pollution degree 1 apply except that the value shall not be less than 0,04 mm, as specified in Table F.4.” 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.

NOTE 4 The dimensioning of clearances and creepage distances for spacings equal to or less than 2 mm for printed wiring board may be optimised under certain conditions in case of use of IEC 60664-5. Only humidity levels HL2 and HL3 are considered.

Table 5 – Minimum clearances and creepage distances

Delete, in this table, point 5 in the first column and the existing Note 3.

Replace, in this table, the last sentence of the existing footnote ^e by the following text:

When interpolating, linear interpolation shall be used and values shall be rounded to the same number of digits as the values picked up from the tables. For determination of creepage distances, see Annex B.

8.1.4.4

In the subclause, replace the existing text by the following:

Current-carrying parts including parts intended for protective conductors, if any, shall be made of a metal having, under the conditions occurring in the equipment, mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use.

Examples of suitable materials are given below:

- copper;
- an alloy containing at least 58 % copper for parts worked cold, or at least 50 % copper for other parts;
- other metal or suitably coated metal, no less resistant to corrosion than copper and having mechanical properties no less suitable.

Replace the existing note of this subclause by the following text:

In case of using ferrous alloys or suitably coated ferrous alloys, compliance to resistance to corrosion is checked by a test of resistance to rusting (9.25).

This correction applies to the French text only.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

8.1.5.1

[IEC 61008-1:2010/AMD1:2012](https://standards.iteh.ai/catalog/standards/sist/30c222b2-07e5-4def-a270-2012)

[https://standards.iteh.ai/catalog/standards/sist/30c222b2-07e5-4def-a270-](https://standards.iteh.ai/catalog/standards/sist/30c222b2-07e5-4def-a270-2012)

Delete the second paragraph and the note in this subclause.

Replace the contents of the last paragraph by the following:

Compliance is checked by inspection, by the tests of 9.5 for screw-type terminals, by specific tests for plug-in or bolt-on RCCBs included in the standard, or by the tests of Annex J, K or L, as relevant for the type of connection.

8.1.5.2

Replace the existing text and Table 6 by the following:

RCCBs shall be provided with:

- either terminals which shall allow the connection of copper conductors having nominal cross sectional areas as shown in Table 6;

NOTE Examples of possible designs of screw-type terminals are given in Annex IC.

- or terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors according to Annex L.

Compliance is checked by inspection, by measurement and by fitting, in turn, one conductor of the smallest and one of the largest cross-sectional area as specified.

Table 6 – Connectable cross-sections of copper conductors for screw-type terminals

Rated current ^{a)} A		Range of nominal cross-section to be clamped ^{b)} mm ²	
Greater than	Up to and including	Rigid (solid or stranded ^{c)} conductors	Flexible conductors
–	13	1 to 2,5	1 to 2,5
13	16	1 to 4	1 to 4
16	25	1,5 to 6	1,5 to 6
25	32	2,5 to 10	2,5 to 6
32	50	4 to 16	4 to 10
50	80	10 to 25	10 to 16
80	100	16 to 35	16 to 25
100	125	25 to 50	25 to 35

NOTE Information on AWG is given in Annex ID.

a) A range of RCCBs having the same fundamental design and having the same design and construction of terminals, the terminals are fitted with copper conductors of the smallest cross-section for the minimum rated current and largest cross-section for the maximum rated current, as specified, solid and stranded, as applicable.

b) It is required that, for current ratings up to and including 50 A, terminals be designed to clamp solid conductors as well as rigid stranded conductors. Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm² up to 6 mm² be designed to clamp solid conductors only.

c) Rigid stranded conductors shall be used for conductors having cross-sections from 1,5 mm² up to 50 mm² and shall be in compliance with class 2 of IEC 60228, related to stranded conductors for single-core.

iTeh STANDARD PREVIEW

8.3 Dielectric properties and isolating capability

(standards.itteh.ai)

Delete, in the last paragraph, the words “and 9.20”

[IEC 61008-1:2010/AMD1:2012](https://standards.itteh.ai/catalog/standards/sist/30c222b2-07e5-4def-a270-ffc4972d666/iec-61008-1-2010-amd1-2012)

Table 9 – List of type tests

<https://standards.itteh.ai/catalog/standards/sist/30c222b2-07e5-4def-a270-ffc4972d666/iec-61008-1-2010-amd1-2012>

Replace, in this table, the dashed item “Limiting values of the non-operating current under overcurrent conditions” by the following new dashed item:

- Verification of limiting value of the non-operating current under overcurrent conditions

Delete, in this table, the dashed item “– Resistance of the insulation against an impulse voltage”.

Add, in this table, at the end of the existing list, the following dashed item:

- Resistance to rusting

Add, in this table, at the end of the existing list, in the second column, the following subclause corresponding to “Resistance to rusting”:

9.25

9.5 Test of reliability of terminals for external conductors

Replace the title of this subclause by the following:

9.5 Tests of reliability of screw-type terminals for external copper conductors

9.5.1

Replace the contents of this subclause by the following text:

The terminals are fitted with copper conductors of the same type (solid, stranded or flexible) of the smallest and largest cross-sections specified in Table 6.

The terminal shall be suitable for all types of conductors: rigid (solid or stranded) and flexible, unless otherwise specified by the manufacturer.

Terminals shall be tested with the minimum and maximum cross-section of each type of conductors on new terminals as follows:

- tests for solid conductors shall use conductors having cross-sections from 1 mm² up to 6 mm², as applicable;
- tests for stranded conductors shall use conductors having cross-sections from 1,5 mm² up to 50 mm², as applicable;
- tests for flexible conductors shall use conductors having cross-sections from 1 mm² up to 35 mm², as applicable.

NOTE Information on AWG is given in Annex ID.

The conductor is inserted into a new terminal for the minimum distance prescribed or, where no distance is prescribed, until it just projects from the far side, and in the position most likely to assist the wire to escape.

The clamping screws are then tightened with a torque equal to two-thirds of that shown in the appropriate column of Table 11.

Each conductor is then subjected to a pull of the value, in newtons, shown in Table 12, according to the relevant cross-section of the tested conductor.

The pull is applied without jerks, for 1 min, in the direction of the axis of the conductor space.

When it is necessary, the tested values, for the different cross-sections with the relevant pulling force, shall be clearly indicated in the test report.

Table 12 – Pulling forces

Replace this table by the following new Table 12:

Cross-section of the conductor inserted in the terminal mm ²	1 up to and including 4	Above 4 up to and including 6	Above 6 up to and including 10	Above 10 up to and including 16	Above 16 up to and including 50
Pull N	50	60	80	90	100

9.5.3

Replace the first sentence of this subclause by the following:

The terminals are fitted with the largest cross-section area specified in Table 6, for stranded and/or flexible copper conductor.

Delete Table 13

This correction applies to the French text only.

This correction applies to the French text only.

9.7.1.4 Condition of the RCCB after the test

Replace the existing text by the following:

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, 9.7.6 and 9.7.7.2 (if applicable).

9.7.7.1 Verification of impulse withstand voltage across the open contacts (suitability for isolation)

Replace the existing title and text of this subclause by the following:

9.7.7.1 General testing procedure for the impulse withstand voltage tests

The impulses are given by a generator producing positive and negative impulses having a front time of 1,2 μ s, and a time to half-value of 50 μ s, the tolerances being as follows:

- ± 5 % for the peak value;
- ± 30 % for the front time;
- ± 20 % for the time to half-value.

For each test, five positive impulses and five negative impulses are applied. The interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.

When performing the impulse voltage test on complete RCCB, the attenuation or amplification of the test voltage shall be taken into account. It needs to be assured that the required value of the test voltage is applied across the terminals of the equipment under test.

The internal impedance of the test apparatus shall have a nominal value not higher than 500 Ω .

NOTE 1 In 9.7.7.2, for the verification of clearances within the basic insulation, on complete RCCB, a very low impedance of the generator is needed for the test. For this purpose, a hybrid generator with a virtual impedance of 2 Ω is appropriate if internal components are not disconnected before testing. However, in any case, a measurement of the correct test voltage directly at the clearance is needed.

The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator. For this purpose, appropriate voltage dividers and voltage sensors shall be used. It is recommended to disconnect surge protective components before testing.

NOTE 2 For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.

Small oscillations in the impulses are allowed, provided that their amplitude near the peak of the impulse is less than 5 % of the peak value.

For oscillations on the first half of the front, amplitudes up to 10 % of the peak value are allowed.

There shall be no disruptive discharge (sparkover, flashover or puncture) during the tests.

NOTE 3 It is recommended that an oscilloscope be used to observe the impulse voltage in order to detect disruptive discharge.

9.7.7.2 Verification of impulse withstand voltage for the parts not tested in 9.7.7.1

Replace the existing title and text of this subclause by the following:

9.7.7.2 Verification of clearances with the impulse withstand voltage

If the measurement of clearances of items 2 and 4 of Table 5 and arrangements given in 9.7.2 b), c) d) and e) shows a reduction of the required length this test applies. This test is carried out immediately after the measurement of the insulation resistance in 9.7.4.

NOTE The measurement of the clearances can be replaced by this test.

The test is carried out on a RCCB fixed on a metal support and being in the closed position.

The test impulse voltage values shall be chosen in Table 16 in accordance with the rated impulse withstand voltage of the RCCB as given in Table 3. These values are corrected for barometric pressure and/or altitude at which the tests are carried out, according to Table 16.

A first series of tests is made applying the impulse voltage between:

- the phase pole(s) and the neutral pole (or path) connected together,
- and the metal support connected to the terminal(s) intended for the protective conductor(s), if any.

A second series of tests is made applying the impulse voltage between:

- the phase pole(s), connected together,
- and the neutral pole (or path) of the RCCB, as applicable.

A third series of tests is made applying the impulse voltage between arrangements given in 9.7.2 b), c), d) and e) and not tested during the two first sequences described here above.

There shall be no disruptive discharge. If, however, only one such disruptive discharge occurs, ten additional impulses having the same polarity as that which caused the disruptive discharge are applied, the connections being the same as those with which the failure occurred.

No further disruptive discharge shall occur.

Table 16 – Test voltage for verification of impulse withstand voltage for the parts not tested in 9.7.7.1

Replace the title of this table by the following:

Table 16 – Test voltage for verification of impulse withstand voltage

9.7.7.3 Verification of leakage currents across open contacts (suitability for isolation)

Replace the first paragraph of this subclause by the following text:

Each pole of a RCCB having been submitted to one of the applicable tests of 9.11.2.2, 9.11.2.3, 9.11.2.4a), 9.11.2.4b) 9.11.2.4c) is supplied at a voltage 1,1 times its rated operational voltage, the RCCB being in the open position.

Add the following new subclauses 9.7.7.4, 9.7.7.4.1, 9.7.7.4.2, 9.7.7.4.3 and 9.7.7.5:

9.7.7.4 Verification of resistance of the insulation of open contacts and basic insulation against an impulse voltage in normal conditions

9.7.7.4.1 General

These tests are not preceded by the humidity treatment described in 9.7.1.

NOTE The tests in 9.7.7.4, as stated in requirements of 8.1.3, will be carried out before 9.7.1 on three samples of Test sequence B.

The test impulse voltage values shall be chosen from Table 22, in accordance with the rated voltage of the installation for which the RCCB is intended to be used as given in Table 3. These values are corrected for barometric pressure and/or altitude at which the tests are carried out, according to Table 22.

Table 22 – Test voltage for verifying the suitability for isolation, referred to the rated impulse withstand voltage of the RCCB and the altitude where the test is carried out

Nominal voltage of the installation V	Test voltages at corresponding altitude				
	$U_{1,2/50}$ a.c. peak kV				
	Sea level	200 m	500 m	1 000 m	2 000 m
Single-phase system with mid-point earthed 120/240 ^{a)}	3,5	3,5	3,4	3,2	3,0
Single phase system 120/240 240 ^{b)}	6,2	6,0	5,8	5,6	5,0
Three-phase systems 230/400	6,2	6,0	5,8	5,6	5,0

a) For installation practice in Japan.
b) For installation practice in North American countries.

9.7.7.4.2 RCCB in opened position

The series of tests is carried out on a RCCB fixed on a metal support as in normal use.

The impulses are applied between:

- the line terminals connected together,
- and the load terminals connected together with the contacts in the open position.

There shall be no disruptive discharges during the test.

9.7.7.4.3 RCCB in closed position

The series of tests is carried out on a RCCB fixed on a metal support, wired as in normal use and being in closed position.

All components bridging the basic insulation have to be disconnected.

NOTE If necessary, separate samples can be prepared by the manufacturer.

A first series of tests is made, the impulses being applied between:

- the phase pole(s) and the neutral pole (or path) connected together,
- and, the metal support connected to the terminal(s) intended for the protective conductor(s), if any.

A second series of tests is made, the impulses being applied between:

- the phase pole(s), connected together
- and the neutral pole (or path) of the RCCB.

There shall be no disruptive discharge. If, however, only one such disruptive discharge occurs, ten additional impulses having the same polarity as that which caused the disruptive discharge are applied, the connections being the same as those with which the failure occurred.

No further disruptive discharge shall occur.

Afterwards, a new sample is tested according to 9.7.7.5.

9.7.7.5 Verification of the behaviour of components bridging the basic insulation

A new RCCB sample is tested in order to check that components bridging the basic insulation would not reduce safety with respect to short term temporary overvoltages.

NOTE 1 Afterward, it is necessary to ensure that components, bridging the basic insulation and having been disconnected during the impulse voltage test for testing the basic insulation, would not impair the behaviour or the safety of the basic insulation of the equipment during normal use.

The test voltage has a frequency of 50 Hz/60 Hz. In accordance with IEC 60364-4-44:2007, Table 44.A.2, and to IEC 60664-1, the r.m.s. value of the test voltage for the basic insulation is $1\,200\text{ V} + U_0$. U_0 being the nominal voltage value between line and neutral.

NOTE 2 This test is performed only on RCBOs, where components bridging the basic insulation have been disconnected during the impulse voltage test of 9.7.7.4.3.

NOTE 3 As an example, for an RCCB having a rated voltage of $U_0 = 250\text{ V}$, the value of the a.c. test voltage for basic insulation is $1\,200\text{ V} + 250\text{ V}$, thus the r.m.s. test voltage is $1\,450\text{ V}$.

The voltage is applied during 5 s between:

- the phase pole(s) and the neutral pole (or path) connected together,
- and the metal support connected to the terminal(s) intended for the protective conductor(s), if any.

The equipment is then visually inspected; no component bridging the basic insulation should show a visible alteration.

NOTE 4 It is accepted to replace a fuse before connecting the equipment to the mains. If a fuse protecting a surge arrester has blown, it is accepted to replace the surge arrester too.

Then, the equipment is connected to the mains in accordance with the manufacturer's instruction. Under the condition of 9.9.2.3, the RCCB shall trip with a test current of $1,25 I_{\Delta n}$. One test only is made on one pole, taken at random, without measurement of break time.

This test is not applied to devices with solid neutral.

9.9.1 Test circuit

Replace the last three paragraphs of this subclause by the following:

The instruments for the measurement of the residual current shall show (or permit to determine) the true r.m.s. value.

NOTE The information for instrument measurement is available at the following CTL webserver:

http://www.iecee.org/ctl/sheet/pdf/CTL%20DSH%20251B%20Beijing%202009_05_15.pdf

For RCCBs having more than one rated frequency, the tests shall be carried out at the lowest and highest frequency, except for test in 9.9.3 (Verification of the correct operation with load at the reference temperature), where verification is performed at only one frequency.

9.11.2.1 General conditions for test

a) Test circuit

Replace, in the existing item a) of this subclause, the words “Figures 8, 9, 10, 11 and 12” by “Figures 7, 8 and 9”.

Replace the second paragraph of the existing item a) of this subclause by the following text:

The supply S feeds a circuit including impedance Z, the SCPD (if any) (see 3.4.8), the RCCB under test (D), and the additional impedance Z1 and / or Z2, as applicable.

Replace, in the fourth paragraph of item a), the first sentence by the following text:

The reactors L shall be preferably air-cored.

This correction applies to the French text only.

Replace the contents of the fifth paragraph of item a) by the following text:

Since the transient recovery voltage characteristics of test circuits including large air-cored reactors are not representative of normal service conditions, the air-cored reactor in any phase shall be shunted by a resistor R taking approximately 0,6 % of the current through the reactor (see Figure 9). This resistor may be omitted if agreed by the manufacturer.

Add the following text between the existing fifth and sixth paragraphs of item a):

If iron-core reactors are used, the iron-core power losses of these reactors shall not exceed the losses that would be absorbed by the resistors connected in parallel with the air-cored reactors.

Replace, in the existing sixth paragraph of item a) the words “the resistors R and reactors L are inserted” by “the impedance L is inserted”.

Replace, in the existing seventh paragraph of item a), the words “the resistors R” by “the impedance Z”.

Replace, in the existing eighth paragraph of item a), the words “The additional impedance Z₃” by “The additional impedance Z₁”.

Add the words “under test” at the end of the existing Note 2.

Replace, in the fifth paragraph after the existing Note 3, the words “resistor R₁” by “resistor R₂”.

Replace the existing sixth and seventh paragraphs after Note 3, before the two dashed items, by the following text:

The voltage sensors are connected:

Replace, in the second paragraph of item e), the words “the resistors R and the reactors L are adjusted” by “the impedance Z are adjusted”.

Replace, in the second paragraph of item e), the words “the current sensor O₁” by “the current sensor”.

Replace, in the third paragraph of item e), the word “Z₃” by “Z₁”.

This correction applies to the French text only.

Replace, in the first paragraph after Note 6, the words “Figures 8 to 12” by “Figures 7 and 8”.

This correction applies to the French text only.

This correction applies to the French text only.

ii) Test in enclosures

This correction applies to the French text only.

Replace, in the existing Note 8, the words “in the appropriate Figures 8 to 12” by “in Figures 7 and 8”.

g) Sequence of operations

Replace, in the third paragraph of this item, the words “the switch T” by “the making switch T”.

Replace, in the fourth paragraph of this item, the words “the switch T” by “the making switch T”.

h) Behaviour of the RCCB during tests

This correction applies to the French text only.

ITC STANDARD PREVIEW
(standards.iteh.ai)

9.11.2.3 Verification of the rated residual making and breaking capacity ($I_{\Delta m}$) of RCCBs and their suitability for use in IT systems

a) Test conditions <https://standards.iteh.ai/catalog/standards/sist/30c222b2-07e5-4def-a270-ffc4972d666/iec-61008-1-2010-amd1-2012>

Replace, in the second paragraph of this item, the words “the resistors R_3 ” by “the impedances Z_1 ”.

b) Test procedure

Replace, in the second paragraph of this item, the words “the auxiliary switch T” by “the making switch T”.

c) Verification of the suitability in IT systems

Replace, in the second paragraph of this item, the words “in Figure 7” by “in Figure 8”.

Replace, in the fifth paragraph of this item, the words “the auxiliary switch T” by “the making switch T”.

9.11.2.4 Verification of the coordination between the RCCB and the SCPD

Replace, in the sixth paragraph of this subclause, the words “the auxiliary switch T” by “the making switch T”.

a) Verification of the coordination at the rated conditional short-circuit current (I_{nc})

1) Test conditions

This correction applies to the French text only.

b) Verification of the coordination at the rated making and breaking capacity (I_m)

1) Test conditions