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Electrical accesories - Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) - Part 1: General rules - Amendment A14

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English version

Electrical accessories
Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's)
Part 1: General rules

Petit appareillage électrique
Interrupteurs automatiques à courant différentiel résiduel avec protection contre les surintensités incorporée pour installations domestiques et analogues (DD)
Partie 1: Règles générales

Elektrisches Installationsmaterial
Fehlerstrom-Schutzschalter mit Überstromauslöser (RCBO's) für Hausinstallationen und für ähnliche Anwendungen
Teil 1: Allgemeine Anforderungen

This amendment A14 modifies the European Standard EN 61009-1:1994; it was approved by CENELEC on 1996-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 Central Secretariat or to any CENELEC member.

This amendment 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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/252/FDIS, intended to be published in a new (second) edition of IEC 61009-1, 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 were approved by CENELEC as amendment A14 to EN 61009-1:1994 on 1996-10-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-07-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2001-01-01

CONTENTS

Add, under Annexes, the title of the following new annex:

Add the following new annex IE

Annex IE
(informative)

Follow-up testing programme for RCBOs

IE.1 General

In order to guarantee the maintenance of the quality level of products, follow-up inspection procedures on the manufacturing process have to be set by the manufacturers.

This annex gives an example of follow-up procedure to be applied when manufacturing RCBOs.

It may be used as a guide by manufacturers for adapting their specific procedures and organization aimed at keeping the required quality level of the product output.

In particular any provision of the supplying follow-up as well as the manufacturing follow-up may be taken to guarantee the quality of the manufactured products on which the safe operation of the residual current device depends.

IE.2 Follow-up testing programme

The follow-up testing programme includes two series of tests.

IE.2.1 *Quarterly follow-up testing programme*

See table IE.1, test sequence Q.

IE.2.2 *Annual follow-up testing programme*

See table IE.1, test sequences Y1 to Y3.

NOTE – The annual follow-up testing may be combined with the quarterly follow-up testing.

Table IE. 1 – Test sequences during follow-up inspections

Test sequence	Clause or subclause	Test	Comments
Q	9.16	Test device	Items b) and c) only, except for the verification of the test circuit ampere turns
	9.9.1.2 a)	Residual operating characteristics	
	9.9.1.2 c)	Residual operating characteristics	
	9.20	Resistance of insulation against impulse voltages	Also carried out between each pole in turn
Y1	9.9.1.4	Residual operating characteristics	–
	9.7	Test of dielectric properties	
	9.10	Mechanical and electrical endurance	
Y2	9.22.1	Reliability (climatic test)	
Y3	9.23	Resistance to ageing	

IE.2.3 *Sampling procedure*

IE.2.3.1 *Quarterly testing programme*

For the purpose of the quarterly testing programme the following inspection levels are applied:

- normal inspection;
- tightened inspection.

Normal inspection will be used for the first follow-up inspection.

For successive inspections, normal or tightened inspection or stopping of the production is considered depending on the results of the on-going tests.

The following criteria for switching over from one level of inspection to another shall be applied:

- Stay at normal level

When normal inspection is applied, normal level is maintained if all six samples pass the test sequence (see table IE.2, sequence Q). If five samples pass the test sequence, the subsequent inspection is made one month only after the preceding one with the same number of samples and the same test sequence.

- Normal to tightened

When normal inspection is applied, tightened inspection shall be applied when four samples only pass the test sequence.

- Normal to production stop

When normal inspection is applied and less than four samples pass the test sequence, the production shall be discontinued pending action to improve the quality.

- Tightened to normal

When tightened inspection is applied, normal inspection shall be applied when at least 12 samples pass the test sequence (see table IE.2).

- Stay at tightened level

When, being at tightened level, 10 or 11 samples only pass the test sequence, the tightened level is maintained and the subsequent inspection is made one month after the preceding one with the same number of samples and the same test sequence.

- Tightened to production stop

In the event that four consecutive inspections remain on the tightened level or when less than 10 samples pass the test sequence, the production shall be discontinued pending action to improve the quality.

- Restart production

The production can restart after appropriate and confirmed corrective action. The restart shall be under tightened inspection conditions.

IE.2.3.2 *Annual testing programme*

For the purpose of the annual testing programme the following inspection levels are applied:

- normal inspection;
- tightened inspection.

Normal inspection will be used for the first follow-up inspection.

For successive inspections, normal or tightened inspections are considered, depending on the results of the on-going tests.

The following criteria for switching over from one level of inspection to another shall be applied.

- Stay at the normal level

When normal inspection is applied, normal level is maintained if all samples pass the test sequence. If two samples pass the test sequence Y1 and no failure occurs during the test sequences Y2 and Y3, the subsequent inspection is made three months after the preceding one with the same number of samples and the same test sequences.

- Normal to tightened

When normal inspection is applied, tightened inspection shall be applied when either:

- only one sample passes the sequence Y1;
- or one failure occurs during any one of test sequences Y2 or Y3.

The subsequent inspection shall be effected within three months of the preceding one, at tightened level for any test sequence in which the failure occurred and at normal level for the other test sequences.

- Normal to production stop

When normal inspection is applied and no sample passes the test sequence Y1, or more than one failure occurs during test sequences Y2 or Y3, the production shall be discontinued pending action to improve the quality.

- Tightened to normal

When tightened inspection is applied, normal inspection shall be applied when:

- at least five samples pass the test sequence Y1; and
- no failure occurs during the test sequence Y2 or Y3.

- Stay at tightened level

When, being at tightened level, four samples only pass the test sequence Y1 and no failure occurs during test sequences Y2 or Y3, the tightened level is maintained and the following inspection is made three months after the preceding one, with the same number of samples and the same test sequences.

- Tightened to production stop

In the event that four consecutive inspections remain on the tightened level or when during one annual inspection one of the following failures occurs:

- less than four samples pass the test sequence Y1;
- more than one failure occurs during test sequences Y2 or Y3;

the production shall be discontinued pending action to improve the quality.

– Restart production

The production can restart after appropriate and confirmed corrective action. The restart shall be under tightened inspection conditions.

IE.2.4 *Number of samples to be tested*

The numbers of samples for the various inspection levels are given in table IE.2.

Table IE.2 – Number of samples to be tested

Inspection sequence	Number of samples for normal inspection	Number of samples for tightened inspection
Q	6	13
Y1, Y2, Y3	3 each	6 each

Out of each series of RCBOs of the same fundamental design only one set of samples need be tested, irrespective of the ratings.

For the purpose of this follow-up testing programme, RCBOs are considered to be of the same fundamental design, if they belong to the same classification according to 4.1, and

– the residual current operating means have identical tripping mechanism and identical relay or solenoid, except for:

- the number of turns and cross-sectional area of the windings;
- the sizes and material of the core of the differential transformer;
- the rated residual current; and

– the electronic part, if any, is of the same design and uses the same components except for variations as to achieve different $I_{\Delta n}$.