

**SLOVENSKI**  
**STANDARD**

**SIST EN 61009-  
1:1996/A11:1997**

prva izdaja  
november 1997

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Electrical accessories - Residual current operated circuit-breakers with integral overcurrent protection of household and similar uses (RCCB's) - Part 1: General rules - Amendment A11

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ICS 29.120.50

Referenčna številka  
SIST EN 61009-1:1996/A11:1997(en)

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EUROPEAN STANDARD

EN 61009-1/A11

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 1995

UDC 621.316.573:621.316.9:620.1  
ICS 29.120.50

CLC/TC22E

Descriptors: Electrical household accessory, low-voltage equipment, residual current operated circuit-breakers, overcurrent protection, definition, characteristics, construction, tests

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

[SIST EN 61009-1:1996/A11:1997](https://standards.iteh.ai/catalog/standards/sist/8e8a0c0c-6bac-4da5-91d4-606926f4bbc0/sist-en-61009-1-1996-a11-1997)

<https://standards.iteh.ai/catalog/standards/sist/8e8a0c0c-6bac-4da5-91d4-606926f4bbc0/sist-en-61009-1-1996-a11-1997>

This amendment A11 modifies the European Standard EN 61009-1:1994; it was approved by CENELEC on 1995-07-04. 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, 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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

### Foreword

This amendment was prepared by the Technical Committee CENELEC TC 23E, Circuit breakers and similar devices for household and similar applications.

Its aim is to add a type of RCBO able to operate at temperatures down to -25 °C with unified requirements acceptable by all members of CENELEC.

The text of the draft was submitted to the formal vote and was approved by CENELEC as amendment A11 to EN 61009-1:1994 on 1995-07-04.

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) 1996-07-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2000-07-01

For products which have complied with EN 61009-1:1994 + A1:1995 before 2000-07-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2005-07-01.

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DEUTSCHE NORM  
DIN EN 61009-1:1996/A11:1997  
Technische Normung  
DIN EN 61009-1:1996/A11:1997  
DIN EN 61009-1:1996/A11:1997  
DIN EN 61009-1:1996/A11:1997

#### 4 Classification

Add the following subclause :

##### 4.13 According to the range of ambient air temperature

- RCBO's for use at ambient air temperatures between  $-5^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$ ;
- RCBO's for use at ambient air temperatures between  $-25^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$ .

#### 5 Characteristics of RCBO's

##### 5.1 Summary of characteristics

Add the following item to the list of common characteristics :

- ranges of ambient air temperature (see 5.3.10)

##### 5.3 Standard and preferred values

Add the following subclause :

##### 5.3.10 Standard ranges of ambient air temperature

The standard ranges of ambient air temperature are :

- $-5^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ ;
- $-25^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ .

#### 6 Marking and other product information

Add the following item :

- t) the symbol of use at ambient air temperatures between  $-25^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$  (the value  $-25$  included in the snow flake symbol according to figure 0027 of ISO 7000), if relevant.

Modify the third sentence after t) to read :

The information under a), b), c), k), l), r) and t) may be marked on the side or on the back of the device and be visible only before the device is installed.

## 7 Standard conditions for operation in service and for installation

### 7.1 Standard conditions

In table 4, second column, add to "-5 °C to +40 °C<sup>2)</sup>", in the same box, the range "-25 °C to +40 °C<sup>2)</sup>".

Modify footnote 7) to read :

7) Extreme limits of -20 °C and 60 °C, for RCBO's for use in the range of -5 °C to +40 °C and of -35 °C and 60 °C, for RCBO's 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.

## 8 Requirements for construction and operation

Add the following subclause :

### 8.17 Behaviour of RCBO's at low ambient air temperatures

RCBO's for use in the range of -25 °C to +40 °C (see 4.13) shall operate reliably at low temperatures.

Compliance is checked by the tests of 9.24.

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## 9 Tests

<https://standards.iteh.ai/catalog/standards/sist/8e8a0c0c-6bac-4da5-91d4-606926f4bbc0/sist-en-61009-1-1996-a11-1997>

### 9.1 General

9.1.1 Table 10 - List of type tests - add the following dashed item :

- Behaviour at low ambient air temperatures of RCBO's operating in the temperature range of -25 °C to +40 °C 9.24

Add the following subclause :

9.24 Verification of the correct operation at low ambient air temperatures for RCBO's for use at temperatures between -25 °C and +40 °C

Enclosed-type RCB'Os are tested in their enclosure, unenclosed-type RCBO's are mounted in an individual enclosure with a degree of protection IP55, and are connected as for normal use (see figure 4a).

NOTE 1: No drain hole in the enclosure shall be opened for this test.

NOTE 2: RCBO's tested in enclosures IP55 may also be used in enclosures of a degree of protection other than IP55 within the temperature range of -25 °C to +40 °C.

The RCBO (including the enclosure) is brought into a suitable test chamber with an ambient air temperature of  $(23 \pm 2)^\circ\text{C}$  and a relative humidity of  $(93 \pm 3)\%$ . The volume ratio of the test chamber to the test samples (including enclosures) shall be greater than 50.

The RCBO is in the ON-position without load and shall be subjected to the following cycle (see figure Z6).

For the first 6 h (stabilization period) the temperature is kept at  $(23 \pm 2)^\circ\text{C}$  and the humidity at  $(93 \pm 3)\%$ . Within the next 6 h the ambient air temperature is decreased to  $(-25 \pm 2)^\circ\text{C}$  without any supply of humidity. This temperature of  $(-25 \pm 2)^\circ\text{C}$  is kept for 6 h. Within the next 6 h the temperature is increased to  $(+23 \pm 2)^\circ\text{C}$  and the relative humidity is increased to  $(93 \pm 3)\%$  (end of the first cycle). This cycle is performed five times.

During these cycles the RCBO shall not trip.

During the fifth cycle, at the end of the period at  $(-25 \pm 2)^\circ\text{C}$ , an a.c. residual current is passed through one pole of the RCBO (see figure 4a) :

- for RCBO's of the general type, the residual current is calibrated to  $1,25 I_{\Delta n}$  and established by closing  $S_2$ . One test only is made on one pole taken at random. The break time measured shall not exceed the value specified in table 1 for  $I_{\Delta n}$ ;
- for RCBO's of type S the residual current is calibrated to  $1,25 \times 2 I_{\Delta n}$  and established by closing  $S_2$ . One test only is made on one pole taken at random. The break time measured shall not exceed the value specified in table 1 for  $2 I_{\Delta n}$ .

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In addition, RCBO's of type A are tested with pulsating d.c. residual currents immediately after the above test with a.c. residual current, the test circuit corresponding to figure 4b :

- for RCBO's of the general type, the residual current is calibrated to  $1,25 \times 2 I_{\Delta n}$  for RCBO's with  $I_{\Delta n} \leq 0,01 \text{ A}$ , and to  $1,25 \times 1,4 I_{\Delta n}$  for RCBO's with  $I_{\Delta n} > 0,01 \text{ A}$ . The current delay angle shall be  $= 0^\circ$ , the position of  $S_3$  is set at random, and the current is established by closing  $S_2$ . One test only is made on one pole taken at random. The break time measured shall not exceed the value specified in table 1 for  $I_{\Delta n}$ ;
- for RCBO's of type S the residual current is calibrated to  $1,25 \times 1,4 \times 2 I_{\Delta n}$ . The current delay angle shall be  $= 0^\circ$ , the position of  $S_3$  is set at random, and the current is established by closing  $S_2$ . One test only is made on one pole taken at random. The break time measured shall not exceed the value specified in table 1 for  $2 I_{\Delta n}$ .

After these tests it shall be possible to switch on the RCBO, without the presence of any residual current, at the temperature of  $-25^\circ\text{C}$ .

**Figures**

Figure 4a - Add the following dashed item in the title :

- behaviour at low ambient air temperature of RCBO's for use in the range of -25 °C to +40 °C (9.24)

Add :

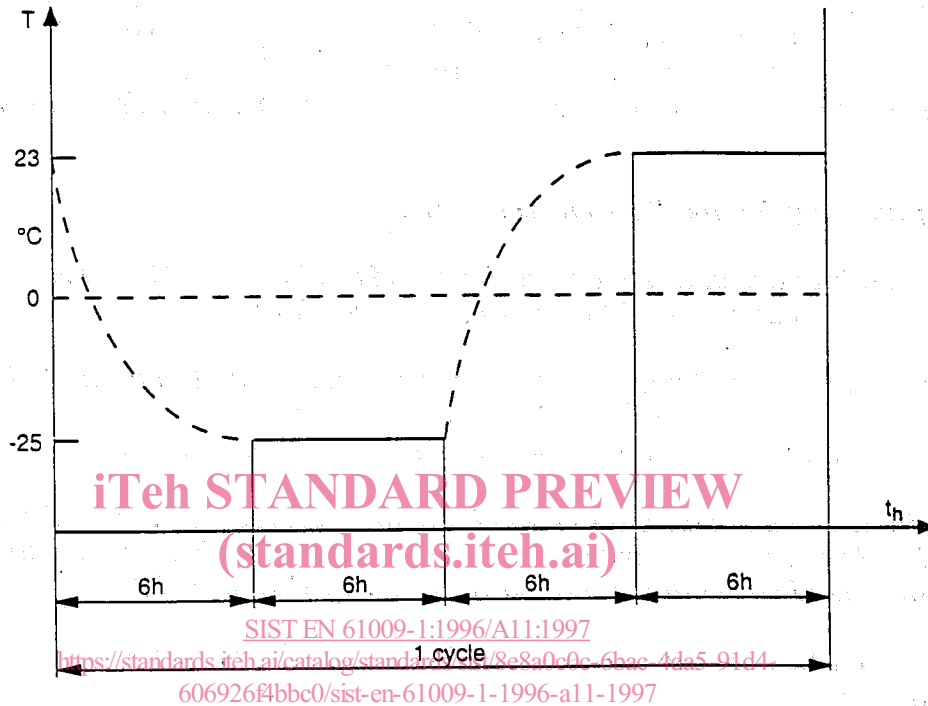


Figure Z6 - Test cycle for low temperature test (9.24)

**Annex A**

Add the following test sequence to Table A.1 - Test sequences :

H 9.24 Verification of correct operation at low ambient air temperature of RCBO's operating at temperatures between -25 °C and +40 °C

Add the following test sequence to Table A.2 - Number of samples for full test procedure :

H 3 2 3

Add the following test sequence to Table A.3 - Number of samples for simplified test procedure :

H <sup>h)</sup> 3 max. rating $I_n$ min. rating $I_{\Delta n}$	3 max. rating $I_n$ min. rating $I_{\Delta n}$	3 max. rating $I_n$ min. rating $I_{\Delta n}$
3 min. rating $I_n$ max. rating $I_{\Delta n}$	3 min. rating $I_n$ max. rating $I_{\Delta n}$	3 min. rating $I_n$ max. rating $I_{\Delta n}$

h) If a range of RCBO's of the same fundamental design are submitted, only the samples with the maximum number of poles need to be tested.



**Annex ZA (normative)**

**Normative references to international publications  
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Add:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 7000	1989	Graphical symbols for use on equipment Index and synopsis	-	-

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**Annex ZB**

Replace by :

**Annex ZB (normative)**

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**Special national conditions**

**Special national condition:** National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions. If it affects harmonization, it forms part of the European Standard.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

**GERMANY**

In Germany only the use of RCBO's of type A (sensitive to pulsating d.c. - see 3.1.3) is allowed.

**IRELAND and UNITED KINGDOM**

In Ireland, RCBO's with unswitched neutral current paths have been used for many years and their continued use is permitted until 1st July 2010 subject to the ETCI National Rules for Electrical Installations.

In the United Kingdom, where neutrals are reliably at earth potential, RCBO's with unswitched neutral current paths are permitted for use over and above the requirements of the Wiring Regulations.