



INTERNATIONAL STANDARD

**Residual current operated circuit-breakers for household and similar use –
Part 3-3: Specific requirements for devices with screw-type terminals for
external untreated aluminium conductors and with aluminium screw-type
terminals for use with copper or with aluminium conductors**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.120.50

ISBN 978-2-8322-6004-3

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	3
INTRODUCTION	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Classification	7
5 Characteristics of devices	7
6 Marking and other product information	7
7 Standard conditions for operation in service and for installation	8
8 Requirements for construction and operation	8
9 Tests	9
9.1 General	9
9.2 Test conditions	10
9.3 Current cycling test	11
9.3.1 General	11
9.3.2 Preparation	11
9.3.3 Test arrangement	11
9.3.4 Temperature measurement	12
9.3.5 Test method and acceptance criteria	12
Bibliography	18
Figure 1 – General arrangement for the test	16
Figure 2 – Test specimen example 1	16
Figure 3 – Test specimen example 2	17
Figure 4 – Test specimen example 3	17
Figure 5 – Test specimen example 4	17
Figure 6 – Test specimen example 5	17
Table 1 – Marking for terminals	8
Table 2 – Connectable cross-sections of aluminium conductors for screw-type terminals	8
Table 3 – List of tests according to the material of conductors and terminals	9
Table 4 – Connectable conductors and their theoretical diameters	10
Table 5 – Cross-sections (S) of aluminium test conductors corresponding to the rated currents	10
Table 6 – Test conductor length	11
Table 7 – Equalizer and busbar dimensions	12
Table 8 – Test current as a function of rated current	14
Table 9 – Example of calculation for determining the average temperature deviation D	14
Table 10 – Connectable cross-sections of copper conductors for screw-type terminals	15
Table 11 – Test copper conductors corresponding to the rated currents	15
Table 12 – Screw thread diameters and applied torques	15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

RESIDUAL CURRENT OPERATED CIRCUIT-BREAKERS FOR HOUSEHOLD AND SIMILAR USE –

Part 3-3: Specific requirements for devices with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62873-3-3 has been prepared by subcommittee 23E: Circuit breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories. It is an International Standard.

This second edition cancels and replaces the first edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Modification of scope to address other devices in addition to RCDs;
- b) Modification of Clause 8 so that IEC 62873-3-3 can be referred to by other product standards in addition to those for RCDs;

- c) Modification of 9.1 so that IEC 62873-3-3 can be referred to by other product standards in addition to those for RCDs.

The text of this International Standard is based on the following documents:

Draft	Report on voting
23E/1274/FDIS	23E/1306/RVD

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

The language used for the development of this International Standard is English.

A list of all parts of the IEC 62873 series published under the general title *Residual current operated circuit-breakers for household and similar use* can be found on the IEC website.

The following differing practices of a less permanent nature exist in the countries indicated below:

- NOTE 2 of Clause 1: the use of aluminium screw-type terminals for use with copper conductors is not allowed (Austria, Australia and Germany);
- NOTE 2 of Clause 1: terminals for aluminium conductors only are not allowed (Austria and Germany);
- NOTE 2 of Clause 1: the use of aluminium conductors is not allowed for final circuits in household and similar installations e.g. offices, shops (Spain);
- NOTE 2 of Clause 1: the minimum cross-sectional area for aluminium conductors is 16 mm² (Denmark).

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

INTRODUCTION

This document is part of the IEC 62873 series described in the outline document IEC 62873-1.

RESIDUAL CURRENT OPERATED CIRCUIT-BREAKERS FOR HOUSEHOLD AND SIMILAR USE –

Part 3-3: Specific requirements for devices with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors

1 Scope

This part of IEC 62873 applies to devices equipped with screw-type terminals of copper – or of alloys containing at least 58 % of copper (if worked cold) or at least 50 % of copper (if worked otherwise), or of other metal or suitably coated metal, no less resistant to corrosion than copper and having mechanical properties no less suitable – for use with untreated aluminium conductors, or with screw-type terminals of aluminium material for use with copper or aluminium conductors.

This document does not cover the use of aluminium conductors or aluminium terminals for DC applications.

Flexible aluminium conductors are not covered by this document.

NOTE 1 Flexible aluminium conductors are under consideration.

This document cannot be used alone but it is intended to be applied together with the applicable product standard.

In this document, copper-clad and nickel-clad aluminium conductors are considered as aluminium conductors.

NOTE 2 In AT, AU and DE, the use of aluminium screw-type terminals for use with copper conductors is not allowed.

- In AT and DE, terminals for aluminium conductors only are not allowed;
- In ES, the use of aluminium conductors is not allowed for final circuits in household and similar installations e.g. offices, shops;
- In DK, the minimum cross-sectional area for aluminium conductors is 16 mm².

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62873-2, *Residual current operated circuit-breakers for household and similar use – Part 2: Residual current devices (RCDs) – Vocabulary*