



# INTERNATIONAL STANDARD

---

**Residual current operated circuit-breakers for household and similar use –  
Part 3-1: Particular requirements for devices with screwless-type terminals for  
external copper conductors**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 29.120.50

ISBN 978-2-8322-9025-5

**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
8.1 General .....	8
8.2 Connection and disconnection of conductors .....	8
8.3 Dimensions of conductors .....	8
8.4 Connectable cross-sectional areas .....	9
8.5 Insertion and withdrawal of conductors .....	9
8.6 Design and construction of terminals .....	9
8.7 Resistance to ageing .....	10
9 Tests .....	10
9.1 General .....	10
9.2 Test of reliability of screwless-type terminals .....	10
9.2.1 Reliability of screwless system .....	10
9.2.2 Test of reliability of connection .....	11
9.3 Tests of reliability of terminals for external conductors .....	11
9.3.1 Mechanical strength .....	11
9.3.2 Cycling test .....	11
Bibliography .....	15
Figure 1 – Connecting samples .....	12
Figure 2 – Examples of screwless-type terminals .....	14
Table 1 – Conductors and their theoretical diameters .....	9
Table 2 – Cross-sections of copper conductors connectable to screwless-type terminals .....	9
Table 3 – Pull forces .....	11
Table 4 – Test copper conductors corresponding to the rated currents .....	12

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

#### Part 3-1: Particular requirements for devices with screwless-type terminals for external copper 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.

International Standard IEC 62873-3-1 has been prepared by subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

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 cover screwless-type terminals up to 40 A;
- b) Modification of scope to address other devices in addition to RCDs;
- c) Modification of Table 1 to cover rated currents up to 40 A;

- d) Modification of 8.1 so that IEC 62873-3-1 can be referred to by other product standards in addition to those for RCDs;
- e) Modification of 9.1 so that IEC 62873-3-1 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:

FDIS	Report on voting
23E/1190/FDIS	23E/1200/RVD

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

This document is intended to be referred to by a product standard of subcommittee IEC SC23E (e.g. from the IEC 61008 series, IEC 61009 series, IEC 62606, and IEC 63052).

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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 committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://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 series described in the outline document IEC 62873-1.

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

### Part 3-1: Particular requirements for devices with screwless-type terminals for external copper conductors

#### 1 Scope

This document applies to devices equipped with screwless-type terminals for current not exceeding 40 A, primarily suitable for connecting unprepared copper conductors of cross-section up to 10 mm<sup>2</sup>.

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

NOTE 1 In CZ, DK, NL, PO and CH, the upper limit of current for use of screwless-type terminals is 16 A.

NOTE 2 In JP, the upper limit of current for use of screwless-type terminals is 30 A.

NOTE 3 The manufacturer can declare in its documentation specific conditions permitting the use of prepared conductors.

In this document, screwless-type terminals are referred to as terminals, and copper conductors are referred to as conductors.

#### 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*

### 3.2

#### **universal terminal**

terminal for the connection and disconnection of all types of conductors (rigid and flexible)

Note 1 to entry: In the following countries, only universal screwless-type terminals are accepted: AT, BE, CN, DK, DE, ES, FR, IT, PT, SE and CH.

### 3.3

#### **non-universal terminal**

terminal for the connection and disconnection of a certain kind of conductor only (e.g. rigid-solid conductors only or rigid-[solid or stranded] conductors only)

### 3.4

#### **push-wire terminal**

non-universal terminal (see 3.3) in which the connection is made by pushing in rigid (solid or stranded) conductors

### 3.5

#### **unprepared conductor**

conductor which has been cut and the insulation of which has been removed for insertion into a terminal

Note 1 to entry: A conductor the shape of which is arranged for introduction into a terminal or the strands of which are twisted to consolidate the end is considered as an unprepared conductor.

[SOURCE: IEC 60050-442:1998, 442-01-26]

### 3.6

#### **low-current terminal**

terminal intended to connect a conductor to a device capable of supplying a voltage signal and/or a current not exceeding 300 mA to the device

Note 1 to entry: This does not apply to special terminal constructions intended to connect to flat or other multiwire cables by performing one "clamping action" only for more than one wire (e.g. bus connections).

## 4 Classification

Clause 4 of the product standard, in which this document is referred to, applies.

## 5 Characteristics of devices

Clause 5 of the product standard, in which this document is referred to, applies.

## 6 Marking and other product information

In addition to Clause 6 of the product standard, in which this document is referred to, the following markings apply:

Universal terminals:

- no marking.

Non-universal terminals:

- terminals declared for rigid-solid conductors shall be marked with the letters "sol";
- terminals declared for rigid (solid and stranded) conductors shall be marked with the letter "r";