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BSI Standards Publication

## Electrical accessories - Residual current monitors (RCMs)

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Part 1: RCMs for household and similar uses

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## National foreword

This British Standard is the UK implementation of EN IEC 62020-1:2021. It is identical to IEC 62020-1:2020. It supersedes BS EN 62020:1999, which will be withdrawn on 16 April 2024.

The UK participation in its preparation was entrusted to Technical Committee PEL/23/1, Circuit breakers and similar equipment for household use.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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More information on legislation can be found at [www.gov.uk](http://www.gov.uk).

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2021.

**Amendments/corrigenda issued since publication**

Date

Text affected

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## EUROPÄISCHE NORM

April 2021

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Supersedes EN 62020:1998 and all of its amendments  
and corrigenda (if any)

English Version

Electrical accessories - Residual current monitors (RCMs) –  
Part 1: RCMs for household and similar uses  
(IEC 62020-1:2020 + COR1:2020)

Petit appareillage électrique - Contrôleurs d'isolement à  
courant différentiel résiduel (RCM) - Partie 1: RCM pour  
usages domestiques et analogues  
(IEC 62020-1:2020 + COR1:2020)

Elektrisches Installationsmaterial - Differenzstrom-  
Überwachungsgeräte (RCMs) - Teil 1: RCMs für  
Hausinstallationen und ähnliche Verwendungen  
(IEC 62020-1:2020 + COR1:2020)

This European Standard was approved by CENELEC on 2020-05-26. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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 CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard 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 CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization  
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Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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## European foreword

The text of document 23E/1180/FDIS, future edition 1 of IEC 62020-1, 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 approved by CENELEC as EN IEC 62020-1:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2021-10-16 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-04-16 document have to be withdrawn

This document supersedes EN 62020:1998 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annexes ZZA and ZZB, which are an integral part of this document.

## Endorsement notice

The text of the International Standard IEC 62020-1:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60051 (series)	NOTE	Harmonized as EN 60051 (series)
IEC 60364 (series)	NOTE	Harmonized as HD 60364 (series)
IEC 61000 (series)	NOTE	Harmonized as EN IEC 61000 (series)
IEC 61008-1:2010	NOTE	Harmonized as EN 61008-1:2012 (modified)
IEC 61543	NOTE	Harmonized as EN 61543
IEC 61557-8	NOTE	Harmonized as EN 61557-8
ISO/IEC Guide 2:2004	NOTE	Harmonized as EN 45020:2006 (not modified)

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(normative)

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

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60664-3	2017	Insulation coordination for equipment within low-voltage systems Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	2017
CISPR 14-1	2016	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	EN 55014-1	2017
IEC 60038	2009	IEC standard voltages	EN 60038	2011
IEC 60068-2-30	2005	Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 + 12 hour cycle)	EN 60068-2-30	2005
IEC 60068-3-4	2001	Environmental testing – Part 3-4: Supporting documentation and guidance – Damp heat tests	EN 60068-3-4	2002
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
A1	1999		A1	2000
A2	2013		A2	2013
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60695-2-10	2013	Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure	EN 60695-2-10	2013
IEC 60695-2-11	2014	Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)	EN 60695-2-11	2014
IEC 61000-4-2	2008	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test	EN 61000-4-2	2009

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IEC 61000-4-3	2020	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test	EN IEC 61000-4-3	2020
IEC 61000-4-4	2012	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	2012
IEC 61000-4-5 AMD1	2014 2017	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5 AMD1	2012 2017
IEC 61000-4-6	2013	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2014
IEC 61000-4-11	2020	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN IEC 61000-4-11	2020
IEC 61000-4-34 AMD1	2005 2009	Electromagnetic compatibility (EMC) - Part 4-34 : Testing and measuring techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16 A per phase	EN 61000-4-34 AMD1	2007 2009
IEC 61543 AMD1 AMD2	1995 2004 2005	Residual current-operated protective devices (RCDs) for household and similar use – Electromagnetic compatibility	EN 61543 AMD11 AMD12 AMD2	1995 2003 2005 2006
IEC 62873-2	2016	Residual current operated circuit-breakers for household and similar use – Part 2: Residual current devices (RCDs) – Vocabulary		
IEC 62873-3-1	2016	Residual current operated circuit-breakers for household and similar use – Part 3-1 : Particular requirements for RCDs with screwless-type terminals for external copper conductors		
IEC 62873-3-2	2016	Residual current operated circuit-breakers for household and similar use – Part 3-2 : Particular requirements for RCDs with flat quick-connect terminations		
IEC 62873-3-3	2016	Residual current operated circuit-breakers for household and similar use – Part 3-3 : Specific requirements for RCDs with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors		
CASRN 110-54-3		Chemical Abstracts Service Registry Number		



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**(informative)**

**Relationship between this European standard and the essential requirements of Directive 2014/30/EU [2014 OJ L96] aimed to be covered**

This European standard has been prepared under the European Commission standardisation request C(2016) 7641 final of 30.11.2016<sup>1</sup>, ('M/552'), as regards harmonised standards in support of Directive 2014/30/EU relating to electromagnetic compatibility, to provide one voluntary means of conforming to essential requirements of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

**Table ZZA.1 — Correspondence between this European standard and the Essential Requirements set out in Directive 2014/30/EU [2014 OJ L96]**

Essential requirements of Directive 2014/30/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
Annex I. 1(a) (electromagnetic disturbances)	8.18.3	<p>When this standard in Clause 8.18.3 normatively references EN 55014-1 for emission requirements the following applies:</p> <p>Clause 7.1 of EN 55014-1 (Significance of a CISPR limit) shall not be applied, if Clause 4 of EN 55014-1 (Limits of disturbances) is applied for the purposes of the presumption of conformity.</p> <p>Clause 7.1 of EN 55014-1 (Significance of a CISPR limit) shall not be applied, if Clause 6 of EN 55014-1 (Operating conditions) is applied for the purposes of the presumption of conformity</p> <p>The following shall not be applied for the purpose of presumption of conformity:</p> <p>Clause 7 of EN 55014-1 (Interpretation of CISPR radio disturbance limits).</p>

<sup>1</sup> COMMISSION IMPLEMENTING DECISION C(2016) 7641 final of 30.11.2016 on a standardisation request to the European Committee for Standardisation, to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards harmonised standards in support of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

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<b>Directive 2014/30/EU</b>	<b>of this EN</b>	<b>Remarks / Notes</b>
Annex I. 1(b) (electromagnetic immunity)	8.18.2 9.22	

**WARNING 1:** Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

**WARNING 2:** Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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## **Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered**

This European Standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZB.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

**Table ZZB.1 — Correspondence between this European standard and Article 3 of Directive 2014/35/EU [2014 OJ L153]**

<b>Safety Objectives of Directive 2014/35/EU</b>	<b>Clause(s) / sub-clause(s) of this EN</b>	<b>Remarks / Notes</b>
(1)(a)	1, 2, 3, 4, 5, 6 – 9.3	
(1)(b)	8.1 – 9.4 and 9.5	
(1)(c)	7 – 9.1 and 9.2, 9.1.3	
(2) (a)	8.2 – 9.6, 8.5 – 9.9.1 to 9.9.3, 8.6 – 9.9.5, 8.13 – 9.9, 8.16 – 9.19, 8.7 – 9.10, 8.15 – 9.17, 8.20 – 9.23, Annex A, 8.19 – 9.9.4	
(2) (b)	8.4 – 9.8 and 9.10.2.2, 8.14 – 9.16, 8.7 – 9.10, 8.8 – 9.11, Annex A	
(2) (c)	8.1.4.3 and 8.1.4.4 – inspection, 8.12 – 9.15	
(2) (d)	8.1.3 – 9.7, Annex B, 8.3 – 9.7	
(3) (a)	8.9 – 9.12, 8.17 – 9.20, 8.17 – 9.21	
(3) (b)	8.10 – 9.13, 8.11 – 9.14, 8.18 – 9.22, 8.15 – 9.17	
(3) (c)	8.14 – 9.16, 8.8 – 9.11, 8.4 – 9.10.2.2	

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### **ELECTRICAL ACCESSORIES – RESIDUAL CURRENT MONITORS (RCMs) –**

#### **Part 1: RCMs for household and similar uses**

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International Standard IEC 62020-1 has been prepared by subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

This first edition cancels and replaces IEC 62020:1998 and IEC 62020:1998/AMD1:2003. This edition constitutes a technical revision.

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

- definition of Type F and Type B RCM;
- marking of Type F and Type B RCM;
- introduction of a new subclause, 8.20;
- modification of 9.7;

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- update of 9.9;
- modification of 9.14;
- modification of 9.19, for introduction of the relevant test for Type F and Type B RCM.

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

FDIS	Report on voting
23E/1180/FDIS	23E/1183/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 has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62020 series, published under the general title *Electrical accessories – Residual current monitors (RCMs)*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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.

The contents of the corrigendum of July 2020 have been included in this copy.

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## INTRODUCTION

The purpose of a residual current monitor (hereinafter referred to as RCM) is to monitor an electrical installation or circuit for the presence of an unbalanced earth fault current and to indicate, by means of an alarm, the presence of such a residual current when it exceeds a predetermined level.

Installation and application rules are given in IEC 60364 (all parts).

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## **ELECTRICAL ACCESSORIES – RESIDUAL CURRENT MONITORS (RCMs) –**

### **Part 1: RCMs for household and similar uses**

#### **1 Scope**

This document applies to residual current monitors for household and similar purposes, having rated operational voltages and a rated voltage of the monitored circuit not exceeding 440 V AC and rated currents not exceeding 125 A.

NOTE 1 The standard for residual current monitors having rated operational voltages and a rated voltage of the monitored circuit exceeding 440 V AC is in preparation, as IEC 62020-2.

RCMs are intended to monitor the residual current of the installation and to give a warning if the residual current between a live part and an exposed conductive part or earth exceeds a predetermined level.

RCMs covered by this document are not intended to be used as protective devices.

RCMs detect residual currents circulating in an AC circuit (e.g. residual alternating current, residual pulsating direct current, residual smooth direct current), whether suddenly applied or slowly rising.

NOTE 2 RCMs for DC systems are under consideration.

This document applies to monitors performing simultaneously the functions of detection of the residual current, of comparison of the value of this current with the residual operating current of the device and providing the specified warning signal(s) when the residual current exceeds this value.

RCMs supplied by internal batteries are not covered by this document.

The requirements of this document apply for standard conditions (see 7.1). Additional requirements can be necessary for RCMs used in locations having severe environmental conditions.

RCMs are intended for use in an environment with pollution degree 2 and overvoltage category III. For an environment with a higher pollution degree, enclosures giving the appropriate degree of protection are used.

RCMs in compliance with this document are suitable for use in TN, TT, and IT systems.

This document does not cover Insulation Monitoring Devices (IMDs), which are covered by the scope of IEC 61557-8.

NOTE 3 An RCM is distinguished from an IMD in that it is passive in its monitoring function and only responds to an unbalanced fault current in the installation being monitored. An IMD is active in its monitoring and measuring functions in that it can measure the balanced and unbalanced insulation resistance or impedance in the installation (see IEC 61557-8).