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Edition 1.0 2020-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electrical accessories – Residual current monitors (RCMs) –
Part 1: RCMs for household and similar uses

Petit appareillage électrique – Contrôleurs d'isolement à courant différentiel résiduel (RCM) –
Partie 1: RCM pour usages domestiques et analogues

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL ACCESSORIES – RESIDUAL CURRENT MONITORS (RCMs) –

Part 1: RCMs for household and similar uses

FOREWORD

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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;

– 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- withdrawn;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.

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).

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).

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 60038, *IEC standard voltages*

IEC 60068-2-30:2005, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h hour cycle)*

IEC 60068-3-4, *Environmental testing – Part 3-4: Supporting documentation and guidance – Damp heat tests*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60695-2-10, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

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)*

IEC 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-11, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

IEC 61000-4-34, *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*

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

IEC 62873-3-1, *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, *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, *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*

CISPR 14-1:2016, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62873-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

Where the terms "voltage" or "current" are used, they imply RMS values, unless otherwise specified. In IEC 62873-2, the term RCD is used instead of RCM.

3.1.1
residual current monitor
RCM
device or association of devices which monitors the residual current in an electrical installation, and which activates an alarm when the residual current exceeds the operating value of the device

Note 1 to entry: This note applies to the French language only.

3.1.2
time-delay RCM
residual current monitoring device specially designed to attain a predetermined value of limiting non-actuating time, corresponding to a given value of residual current

[SOURCE: IEC 60050-442:2019, 442-05-05]

3.1.3
main circuit
<of an RCM> conductive part of an RCM included in the current paths (see 4.3)

Note 1 to entry: The main circuit includes the monitored circuit and the separate supply circuit, if applicable.

[SOURCE: IEC 60050-441:1984, 441-15-02, modified – in the definition, "switching device" has been replaced by "RCM", the last part has been deleted, and the note added.]

3.1.4
alarm state
alarm state indicates that the residual current in the installation monitored has exceeded the preset level of the RCM