SLOVENSKI STANDARD
oSIST prEN IEC 62020-1:2019

01-januar-2019

Električni pribor - Monitorji preostalega (diferenčnega) toka za gospodinjsko in podobno uporabo

Electrical accessories - Residual current monitors for household and similar uses (RCMs)

Elektrisches Installationsmaterial - Differenzstrom-Überwachungsgeräte für Hausinstallationen und ähnliche Verwendungen (RCMs)

Petit appareillage électrique - Contrôleurs d'isolement à courant différentiel résiduel (RCM) pour usages domestiques et analogues

Ta slovenski standard je istoveten z: **prEN IEC 62020-1:2018**

ICS:

29.120.50	Varovalke in druga medtokovna zaščita	Fuses and other overcurrent protection devices

oSIST prEN IEC 62020-1:2019 **en,fr,de**

23E/1081/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
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IEC SC 23E : CIRCUIT-BREAKERS AND SIMILAR EQUIPMENT FOR HOUSEHOLD USE	
SECRETARIAT: Italy	SECRETARY: Mr Giovanni Cassinelli
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 22,TC 61,TC 64,TC 69,TC 82,TC 88,TC 105,TC 114,TC 117,SC 121A	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☒ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Electrical accessories - Residual current monitors for household and similar uses (RCMs)

PROPOSED STABILITY DATE: 2022

NOTE FROM TC/SC OFFICERS:

This document is the revision of IEC 62020, but, according to the decision agreed with SC121A (See 23E/1070/INF), has been renumbered IEC 62020-1 (see also documents 23E/1071/Q and 23E/1078/RQ).

Therefore the new IEC 62020-1 when published will replace IEC 62020: 1998 + AMD 1: 2003.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL ACCESSORIES – RESIDUAL CURRENT MONITORS FOR HOUSEHOLD AND SIMILAR USES (RCMs)

FOREWORD

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

The text of this standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

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

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

This edition constitutes a technical revision.

The main changes with respect to the previous edition are as follows:

– definition of Type F and Type B RCM;
– marking of Type F and Type B RCM;
– introduction of subclause 8.20 - Response to temporary overvoltages on the LV-side due to fault conditions on the HV-side;
– modification of subclause 9.7 – Test of dielectric properties;
– update of subclause 9.9 - Verification of the operating characteristics;
– modification of subclause 9.14 - Test of resistance to abnormal heat and to fire;
– modification of subclause 9.19 - Additional verification of the correct operation at residual currents with DC components, for introduction of the relevant test for Type F and Type B RCM.

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

• reconfirmed;
• withdrawn;
• replaced by a revised edition, or
• amended.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

ELECTRICAL ACCESSORIES – RESIDUAL CURRENT MONITORS FOR HOUSEHOLD AND SIMILAR USES (RCMs)

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.

An RCM may be used in conjunction with protective devices (see IEC 60364-4).

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

1 Scope

This document applies to residual current monitors having rated voltages not exceeding 440 V AC and rated currents not exceeding 125 A for household and similar purposes.

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 standard are not intended to be used as protective devices.

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

NOTE 1 RCM 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 prescribed warning signal(s) when the residual current exceeds this value.

RCMs having internal batteries are not covered by this document.

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

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

NOTE 2 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 60038:2009, *IEC standard voltages*

IEC 60051(all parts), *Direct acting indicating analogue electrical measuring instruments and their accessories*

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

IEC 60068-3-4:2001, *Environmental testing - Part 3-4: Supporting documentation and guidance - Damp heat tests*

IEC 60364 (all parts), *Low-voltage electrical installations*

IEC 60479 (all parts), *Effects of current on human beings and livestock*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

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

IEC 60664-3:2003, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*
IEC 60664-3:2003/AMD1:2010

IEC 60695-2-10:2013, *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 (all parts), *Electromagnetic compatibility (EMC)*

IEC 61008-1:2010, *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – Part 1: General rules*
IEC 61008-1:2010/AMD1:2012
IEC 61008-1:2010/AMD2:2013

IEC 61543:1995, *Residual current-operated protective devices (RCDs) for household and similar use – Electromagnetic compatibility*
IEC 61543:1995/AMD1:2004
IEC 61543:1995/AMD2:2005

IEC 61557-8:2014, *Electrical safety in low-voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 8: Insulation monitoring devices for IT systems*

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

ISO/IEC Guide 2:2004, *Standardization and related activities -- General vocabulary*

3 Terms and definitions

For the purpose of this document, the following definitions 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.

3.1 Definitions relating to currents flowing from live parts to earth

3.1.1
earth fault current
current flowing to earth due to an insulation fault

3.1.2
earth leakage current
current flowing from the live parts of the installation to earth in the absence of an insulation fault

3.1.3
pulsating direct current

current of pulsating wave form which assumes, in each period of the rated power frequency, the value 0 or a value not exceeding 0,006 A DC during one single interval of time, expressed in angular measure, of at least 150°

3.1.4
current delay angle
α
time, expressed in angular measure, by which the starting instant of current conduction is delayed by phase control

3.2 Definitions relating to the energization of an RCM

3.2.1
energizing quantity
electrical excitation quantity which alone, or in combination with other such quantities, shall be applied to an RCM to enable it to accomplish its function under specified conditions

3.2.2
energizing input-quantity
energizing quantity by which the RCM is activated when it is applied under specified conditions

These conditions may involve, for example, the energizing of certain auxiliary elements.

3.2.3
residual current
I_{Δ}
vector sum of the instantaneous values of the current flowing in the main circuit of the RCM (expressed as RMS value)

3.2.4
residual operating current
$I_{\Delta n}$
value of residual current which causes the RCM to operate under specified conditions

3.2.5
residual non-operating current
$I_{\Delta no}$
value of residual current at which and below which the RCM does not operate under specified conditions

3.3 Definitions relating to the operation and to the functions of residual current monitors

3.3.1
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

3.3.2
RCMs functionally independent of line voltage
RCMs for which the functions of detection, evaluation and actuation do not depend on the line voltage

3.3.3
RCMs functionally dependent on line voltage
RCMs for which the functions of detection, evaluation or actuation depend on the line voltage

Note 1 to entry: It is understood that the line voltage is applied to RCMs for detection, evaluation or actuation.

3.3.4
limiting non-actuating time
maximum delay during which a value of residual current higher than the residual operating current can be applied to the RCM without causing it to operate

3.3.5
time-delay RCM
RCM specially designed to attain a predetermined value of limiting non-actuating time, corresponding to a given value of residual current

3.3.6
main circuit (of an RCM)
all the conductive parts of an RCM included in the current paths (see 4.3)

3.3.7
control and auxiliary circuit (of an RCM)
all the conductive parts of an RCM intended to be included in a circuit other than the main circuit of the RCM

Note 1 to entry: The circuits intended for the test device are included in this definition.

3.3.8
RCM Type A
RCM for which monitoring is ensured for

– residual sinusoidal alternating currents;
– residual pulsating direct currents;
– residual pulsating direct currents superimposed on a smooth direct current of 0,006 A,

with or without phase-angle control, independent of polarity, whether suddenly applied or slowly rising

3.3.9
test device
device incorporated in the RCM simulating the residual current conditions for the operation of the RCM under specified conditions