

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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CONTENTS

FOREWORD.....	8
INTRODUCTION.....	10
1 Scope.....	11
2 Normative references	12
3 Terms and definitions	13
4 Classification.....	15
4.1 According to the method of operation.....	15
4.1.1 RCM functionally dependent on line voltage	15
4.1.2 RCM functionally dependent on an energy source other than line voltage	15
4.2 According to the type of installation	15
4.3 According to the number of current paths.....	15
4.4 According to the ability to adjust the residual operating current.....	15
4.5 According to the possibility of adjusting the time-delay	15
4.6 According to the protection against external influences	15
4.7 According to the method of mounting	15
4.8 According to the method of connection	15
4.9 According to the type of connection of the load conductors	15
4.9.1 RCM to which the monitored line is not directly connected.....	15
4.9.2 RCM to which the monitored line is directly connected.....	16
4.10 According to fault indicating means.....	16
4.11 According to ability to directionally discriminate between supply-side and load-side residual currents.....	16
4.12 According to the supply system.....	16
4.12.1 RCM for use in AC supply systems	16
4.12.2 RCM for use in DC supply systems	16
4.13 According to the type of residual current monitored.....	16
4.14 According to the method of residual current detection	16
5 Characteristics of RCMs	16
5.1 Summary of characteristics	16
5.2 Rated quantities and other characteristics.....	17
5.2.1 Rated voltage	17
5.2.2 Rated current (I_n)	17
5.2.3 Rated residual operating current ($I_{\Delta n}$)	17
5.2.4 Rated residual non-operating current ($I_{\Delta no}$)	18
5.2.5 Rated frequency	18
5.2.6 Operating characteristics	18
5.3 Standard and preferred values	18
5.3.1 Preferred values of rated voltage (U_e)	18
5.3.2 Preferred values of rated current (I_n).....	19
5.3.3 Preferred values of rated residual operating current ($I_{\Delta n}$).....	19
5.3.4 Standard value of residual non-operating current ($I_{\Delta no}$).....	19
5.3.5 Standard minimum value of the non-operating overcurrent in the case of single-phase load through an RCM	19
5.3.6 Preferred values of rated frequency	19
5.3.7 Standard and preferred values of the rated conditional short-circuit current (I_{nc}) (only applicable to RCMs classified according to 4.9.2)	19

5.3.8	Maximum actuating time ($T_{\max}$)	20
5.3.9	Minimum non-actuating time ($T_{\min}$)	20
5.4	Coordination with short-circuit protective devices (SCPDs) (only valid for RCMs classified according to 4.9.2)	20
5.4.1	General	20
5.4.2	Rated conditional short-circuit current (I_{nc})	20
5.4.3	Rated conditional residual short-circuit current ($I_{\Delta c}$)	20
6	Marking and other product information	20
7	Standard conditions for operation in service and for installation	23
7.1	Standard conditions	23
7.2	Conditions of installation	24
8	Requirements for construction and operation	24
8.1	Mechanical design	24
8.1.1	General	24
8.1.2	Features	24
8.1.3	Clearances and creepage distances	25
8.1.4	Screws, current-carrying parts and connections	26
8.1.5	Terminals for external conductors	27
8.2	Protection against electric shock	29
8.3	Dielectric properties	30
8.4	Temperature rise	30
8.4.1	General	30
8.4.2	Temperature rise limits	30
8.4.3	Ambient air temperature	31
8.5	Operating characteristic	31
8.6	Directional discrimination	31
8.7	Operational endurance	31
8.8	Performance at short-circuit currents	31
8.9	Resistance to mechanical impact	31
8.10	Resistance to heat	32
8.11	Resistance to abnormal heat and to fire	32
8.12	Test device	32
8.13	Correct operation of RCMs within the supply voltage range	32
8.14	Behaviour of RCMs in case of overcurrents in the main circuit	32
8.15	Resistance of RCMs to unwanted initiating of an alarm due to current surges caused by impulse voltages	33
8.16	Behaviour of RCMs in case of earth fault currents comprising DC components	33
8.17	Reliability	33
8.18	Electromagnetic compatibility (EMC)	33
8.18.1	General	33
8.18.2	Immunity requirements	33
8.18.3	Emission requirements	33
8.19	Connection of an external current transformer (CT)	33
8.20	Response to temporary overvoltages on the LV side due to fault conditions on the HV side	33
9	Tests	34
9.1	General	34
9.2	Test conditions	35

9.3	Test of indelibility of marking	35
9.4	Test of reliability of screws, current-carrying parts and connections	36
9.5	Test of reliability of terminals for external conductors	37
9.6	Verification of protection against electric shock	38
9.7	Test of dielectric properties	39
9.7.1	Resistance to humidity	39
9.7.2	Insulation resistance of the main circuits of RCMs classified according to 4.9.2	39
9.7.3	Dielectric strength of the main circuit of RCMs classified according to 4.9.2	40
9.7.4	Insulation resistance and dielectric strength of control and auxiliary circuits	41
9.7.5	Secondary circuit of detection transformers	42
9.7.6	Capability of the RCM to withstand high DC voltages due to insulation measurements	42
9.7.7	Verification of impulse withstand voltages	42
9.8	Test of temperature rise	44
9.8.1	Ambient air temperature	44
9.8.2	Test procedure	44
9.8.3	Measurement of the temperature rise of parts	45
9.8.4	Temperature rise of a part	45
9.9	Verification of the operating characteristics	45
9.9.1	Test circuit	45
9.9.2	Off-load tests with residual sinusoidal alternating currents at the reference temperature of $20\text{ °C} \pm 2\text{ °C}$	45
9.9.3	Verification of the correct operation with load at the reference temperature	46
9.9.4	Verification of the connection and the function of an external current transformer (CT)	46
9.9.5	Verification of directional discrimination for RCMs classified according to 4.11	47
9.10	Verification of operational endurance	48
9.10.1	General	48
9.10.2	Test procedure	48
9.11	Verification of short-circuit withstand capability	48
9.11.1	List of the short-circuit tests	48
9.11.2	Short-circuit tests	48
9.12	Verification of resistance to mechanical impact	53
9.12.1	General	53
9.12.2	Test for all RCM types	53
9.12.3	Rail-mounted RCMs	55
9.12.4	Plug-in type RCMs	55
9.13	Test of resistance to heat	55
9.14	Test of resistance to abnormal heat and to fire	56
9.15	Verification of the operation of the test device at the limits of rated voltage	57
9.16	Verification of limiting values of the non-operating current under overcurrent conditions	57
9.16.1	General	57
9.16.2	Verification of the limiting value of overcurrent in the case of a load through an RCM with two current paths	57

9.16.3	Verification of the limiting value of overcurrent in the case of a single-phase load through a three-pole or four-pole RCM.....	58
9.16.4	Verification of the limiting value of overcurrent in the case of a single-phase load through an RCM with an external detecting device (transformer)	58
9.17	Verification of resistance against unwanted operation due to current surges caused by impulse voltages	59
9.18	Void	59
9.19	Additional verification of the correct operation at residual currents with DC components	59
9.19.1	General	59
9.19.2	Verification of the correct operation for RCM Type A, Type F and Type B	61
9.19.3	Verification of correct operation for RCM Type F and Type B	62
9.19.4	Verification of correct operation for RCM Type B	63
9.20	Verification of reliability	66
9.20.1	General	66
9.20.2	Climatic test	66
9.20.3	Test with temperature of 40 °C	68
9.21	Verification of ageing of electronic components	68
9.22	Verification of EMC requirements	68
9.22.1	General	68
9.22.2	Description of quiescent mode and operate mode	70
9.22.3	Criterion A1	70
9.22.4	Criterion A2	70
9.22.5	Criterion B	70
9.23	Response of the RCM to temporary overvoltages on the LV side, due to fault conditions on the HV side	71
9.24	Test of resistance to rusting	71
Annex A (normative)	Test sequence and number of samples to be submitted for verification of conformity to this document	102
A.1	General	102
A.2	Test sequences	102
A.3	Number of samples to be submitted for full test procedure	103
A.4	Number of samples to be submitted for simplified test procedures in case of submitting simultaneously a range of RCMs of the same fundamental design	103
Annex B (normative)	Determination of clearances and creepage distances	106
Bibliography		109
Figure 1	– Standing current in FE conductor	72
Figure 2	– Standard test finger (9.6)	73
Figure 3	– Test circuit for verification of the operating characteristics for RCMs	74
Figure 4	– Test circuit for verification of directional discrimination in IT systems for RCMs classified according to 4.12	75
Figure 5	– Test circuit for verification of the correct operation of RCMs in the case of residual pulsating direct currents	76
Figure 6	– Test circuit for verification of the correct operation of RCMs in the case of residual pulsating direct currents superimposed by smooth direct current of 0,006 A	78
Figure 7	– Test circuit for verification of the coordination with an SCPD of an RCM with two current paths (9.11)	79

Figure 8 – Test circuit for verification of the coordination with an SCPD of an RCM with three current paths in a three-phase circuit (9.11).....	80
Figure 9 – Test circuit for verification of the coordination with an SCPD of an RCM with four current paths on a three-phase circuit with neutral (9.11).....	81
Figure 10 – Test apparatus for verification of the minimum I^2t and I_p values to be withstood by the RCM (9.11.2.1 a)).....	82
Figure 11 – Mechanical impact test apparatus (9.12.2)	83
Figure 12 – Striking element for pendulum impact test apparatus (9.12.2)	84
Figure 13 – Mounting support for sample for mechanical impact test (9.12.2)	85
Figure 14 – Example of mounting an unenclosed RCM for mechanical impact test (9.12.2).....	86
Figure 15 – Example of mounting of panel mounting type RCM for the mechanical impact test (9.12.2).....	87
Figure 16 – Application of force for mechanical test of rail-mounted RCM (9.12.3).....	88
Figure 17 – Ball-pressure test apparatus (9.13.3)	88
Figure 18 – Test circuit for verification of the limiting value of overcurrent in the case of single-phase load	89
Figure 19 – Current ring wave 0,5 μ s/100 kHz	90
Figure 20 – Test circuit for the ring-wave test of RCMs	90
Figure 21 – Stabilizing period for reliability test (9.20.2.4).....	91
Figure 22 – Reliability test cycle (9.20.2.4)	92
Figure 23 – Example test circuit for verification of ageing of electronic components (9.21).....	93
Figure 24 – RCMs without monitored lines connected	94
Figure 25 – RCMs with monitored lines connected	94
Figure 26 – Example of a test circuit for verification of correct operation in case of residual sinusoidal alternating currents composed of multi-frequency components resulting from single-phase supplied speed motor control equipment	95
Figure 27 – Test circuit for verification of correct operation in case of residual sinusoidal alternating current up to 1 000 Hz	96
Figure 28 – Test circuit for 2-,3- and 4-pole RCM Type B to verify the correct operation in case of residual pulsating direct currents which may result from rectifying circuits supplied from two phases	97
Figure 29 – Test circuit for 3- and 4-pole RCM Type B to verify the correct operation in case of residual pulsating direct currents which may result from rectifying circuits supplied from three phases	98
Figure 30 – Test circuit for 2-, 3- and 4-pole RCM Type B to verify the correct operation in case of a residual smooth direct current	99
Figure 31 – Diagrammatic representation for glow-wire test	100
Figure 32 – Test circuit for 2-, 3- and 4-pole RCM Type B to verify the correct operation in case of a residual alternating current superimposed on a smooth direct current.....	101
Figure B.1 – Illustrations of the application of creepage distances	107
Figure B.2 – Illustrations of the application of creepage distances	108
Table 1 – Marking	21
Table 2 – Standard conditions for operation in service	24
Table 3 – Clearances and creepage distances	26

Table 4 – Connectable cross-sections of copper conductors for screw-type terminals	28
Table 5 – Temperature rise values	31
Table 6 – List of type tests depending on RCM classification	34
Table 7 – Test copper conductors corresponding to the rated currents	35
Table 8 – Screw thread diameters and applied torques	36
Table 9 – Pulling forces	37
Table 10 – Conductor dimensions	38
Table 11 – Test voltage of control and auxiliary circuits	41
Table 12 – Rated impulse withstand voltage as a function of the nominal voltage of the installation	44
Table 13 – Test voltage for verification of impulse withstand voltage	44
Table 14 – Silver wire diameter as a function of rated current and short-circuit currents	49
Table 15 – Minimum values of I^2t and I_p	50
Table 16 – Power factors for short-circuit tests	51
Table 17 – Overview of test details for the RCM types	60
Table 18 – Actuating current ranges	61
Table 19 – Frequency component values of test currents and starting current values for verifying operating	62
Table 20 – Operating current ranges for composite residual current	62
Table 21 – Residual non-operating and operating current according to frequencies that differ from the rated frequency 50/60 Hz for RCM Type B	64
Table 22 – EMC tests	69
Table 23 – Explanation of letter symbols used in Figure 6 to Figure 9	77
Table A.1 – Test sequences	102
Table A.2 – Number of samples submitted to tests	103
Table A.3 – Tests with a reduced number of samples	105

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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;
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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).

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