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TEST REPORT

IEC 62423

Type F and type B residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)

Report Number. .....:	2506B1061SHA-001
Date of issue .....:	2025-08-06
Total number of pages.....:	287
Applicant's name.....:	Wenzhou HONI Electric Co., Ltd.
Address .....:	No.46 Keaisi Road, Xiangyang Industrial Zone, Liushi Town, Yueqing City, Zhejiang, P.R.China
Test specification:	
Standard .....:	IEC 62423:2009 used in conjunction with IEC 61008-1:2010, AMD1:2012, AMD2:2013 IEC 61008-2-1:1990 or IEC 61008-2-2:1990
Test procedure .....:	CB Scheme
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC62423C
Test Report Form(s) Originator.....:	OVE
Master TRF .....:	Dated 2017-06

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing CB testing laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description .....:	Type B RCCBs
Trade Mark .....:	HONI®
Manufacturer.....:	Same as applicant
Model/Type reference .....:	HB202B, HB204B
Ratings .....:	U_n= AC240V (AC230V) for 1P+N, AC415V (AC400V) for 3P+N I_n= 16, 20, 25, 32, 40, 50, 63A $I_{\Delta n}$= 30, 100, 300mA, Type B

Testing procedure and testing location:			
☒	**Testing CB Laboratory:**	Intertek Testing Services (Shanghai FTZ) Co., Ltd.	
Testing location/ address .....:		Building No.85&86, 1198 Qinzhou Road (North), Shanghai 200233, China	
Tested by (name, function + signature) .....:		**Quiet Lin** (Engineer)	
Approved by (name, function + signature) ..:		**Mark He** (Mandated Reviewer)	
☐	**Testing procedure: CTF Stage 1**		
Testing location/ address .....:			
Tested by (name, function + signature) .....:			
Approved by (name, function + signature) ..:			
☐	**Testing procedure: CTF Stage 2**		
Testing location/ address .....:			
Tested by (name + signature).....:			
Witnessed by (name, function + signature) ..:			
Approved by (name, function + signature) ...:			
☐	**Testing procedure: CTF Stage 3**		
☐	**Testing procedure: CTF Stage 4**		
Testing location/ address .....:			
Tested by (name, function + signature) .....:			
Witnessed by (name, function + signature) ..:			
Approved by (name, function + signature) ...:			
Supervised by (name, function + signature). :			

List of Attachments (including a total number of pages in each attachment):

The attachment to test report IEC 62423 with European group differences and national difference (totally 59 pages): page 216 to 274.

The attachment to APPENDIX ZZ for differences of AS/NZS 61009.1(totally 4 pages): page 275 to 278.

Photo attachment (totally 15 pages): page 279 to 287.

Summary of testing:

CBTL: Intertek Testing Services (Shanghai FTZ) Co., Ltd.

Address: Building No. 85 & 86,1198 Qinzhou Road (North) Shanghai 200233 China

Tests performed (name of test and test clause):		**Testing location:**
Clause	**Testing items**	
IEC62423:		
6	Marking	CBTL
9.1.2	Verification of the correct operation in case of a steady increase of composite residual current	CBTL
9.1.3	Verification of the correct operation in case of sudden appearance of composite residual current	CBTL
9.1.4	Verification of the correct operation for four-pole Type F RCD powered on two poles only	CBTL
9.1.5	Verification of behaviour at surge currents up to 3 000 A (8/20 µs surge current test)	CBTL
9.1.6	Verification of behaviour in the case of inrush residual currents	CBTL
9.1.7	Verification of the correct operation in case of residual pulsating direct currents in presence of a standing smooth direct current of 0,01 A	CBTL
9.2.1	Verification of the operating characteristic at the reference temperature (20±5) °C	CBTL
9.2.2	Tests at the temperature limits	CBTL
9.2.3	Verification of the correct operation for three- and four-pole Type B RCDs powered on two poles only	CBTL
9.2.4	Verification of the RCD after test sequences	CBTL
IEC 61008-1/2:		
9.3	Test of indelibility of marking	CBTL
9.4	Test of reliability of screws, current-carrying parts and connections	CBTL
9.5	Tests of reliability of screw-type terminals for external copper conductors	CBTL
9.6	Test of protection against electric shock	CBTL
9.7	Test of dielectric properties	CBTL
9.8	Test of temperature-rise and measurement of power loss	CBTL
9.9	28-day test	CBTL
9.10	Test of tripping characteristic	CBTL
9.11	Verification of mechanical and electrical endurance	CBTL
9.12	Short-circuit tests	CBTL
9.13	Mechanical stresses	CBTL

Tests performed (name of test and test clause):		Testing location:
Clause	**Testing items**	
9.14	Test of resistance to heat	CBTL
9.15	Resistance to abnormal heat and to fire	CBTL
9.16	Test of resistance to rusting	CBTL

Summary of compliance with National Differences (List of countries addressed):

The product fulfils the requirements of EN 62423:2012+A11:2021+A12:2022 and BS EN 62423:2012 +A12:2022.
The product fulfils the requirements of EN 61008-1:2012+A1:2014+A2:2014+A11:2015+A12:2017 and BS EN 61008-1:2012+A12:2017.
The product fulfils the requirements of EN 61008-2-1:1994+A11:1998 and BS EN 61008-2-1:1995.
The product fulfils the requirements of AS/NZS 61008.1:2015+Amd:2024.

Summary of testing:

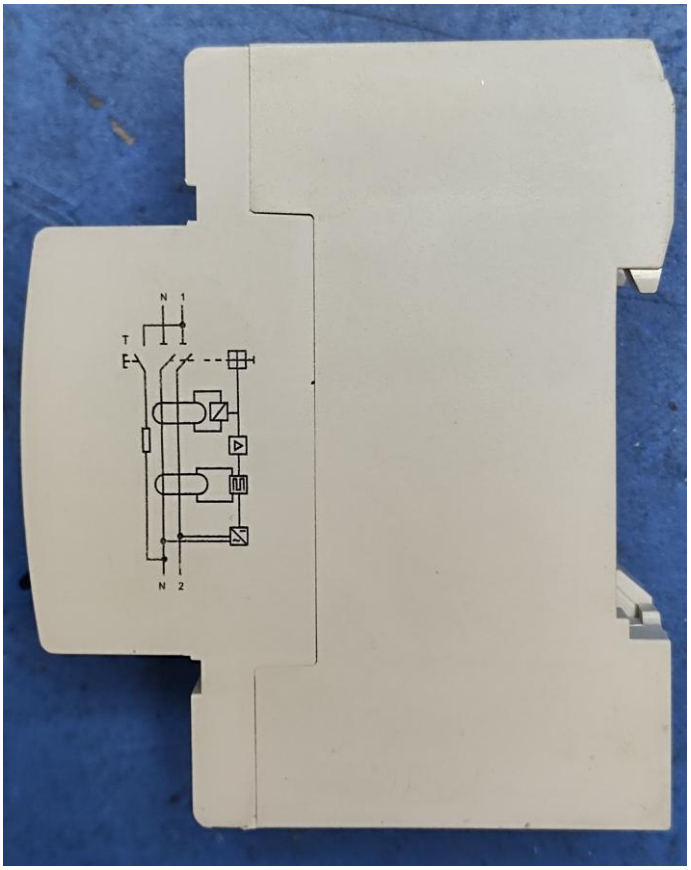
Model	No. of poles	In (A)	IΔn (mA)	Test sequence and number of samples											
				A_1	A_2	B	C	D_0+D_1		D_2	E	F	G_0	G_1 a)	EMC b)
HB202B	1P+N	63	30	x	x	x	x	x		x	x	x	x	-	-
HB202B	1P+N	63	100	-	-	-	-	x	-	-	-	-	-	-	-
HB202B	1P+N	63	300	-	-	-	-	x	-	-	-	-	-	-	-
HB202B	1P+N	16	300	-	-	-	-	-		-	-	x	x	-	-
HB204B	3P+N	63	30	x	x	x	x	x		x	x	x	x	x	x
HB204B	3P+N	16	300	-	-	-	-	-		-	-	x	x	x	-

Note:

a) Sequence G1 is only applicable to EN standard

b) See EMC test report No. 2506B1062SHA-001

Copy of marking plate: HB202B, 1P+N



Copy of marking plate: HB204B, 3P+N

Test item particulars.....:	
Classification of RCCBs functionally dependent on the line voltage(Type A part) .....:	~~Yes~~ / **No**
Classification of RCCBs functionally dependent on the line voltage(Type B part) .....:	**Yes** / ~~No~~
Opening automatically in case of failure of the line voltage.....:	~~Yes~~ / **No**
- reclosing automatically when the line voltage is restored .....:	~~Yes~~ / **No**
- not reclosing automatically when the line voltage is restored .....:	~~Yes~~ / **No**
Not opening automatically in case of failure of the line voltage.....:	
- able to trip in a hazardous situation arising on failure of line voltage .....:	~~Yes~~ / **No**
- not able to trip in a hazardous situation arising on failure of line voltage(Type A part) .....:	~~Yes~~ / **No**
- not able to trip in a hazardous situation arising on failure of line voltage(Type B part) .....:	~~Yes~~ / **No**
Type of RCCB.....:	
- type (A)/ B .....:	**Yes** / ~~No~~
- type (A)/ F .....:	~~Yes~~ / **No**
- independent of the line voltage(Type A part).....:	**Yes** / ~~No~~
- dependent on the line voltage(Type B part) .....:	**Yes** / ~~No~~
- without time delay.....:	**Yes** / ~~No~~
- with time delay: type S.....:	~~Yes~~ / **No**
- enclosed.....:	~~Yes~~ / **No**
- unenclosed.....:	~~Yes~~ / **No**
- IP number .....:	IP20(normally installed)
- for fixed installation.....:	**Yes** / ~~No~~
- for mobile installation.....:	~~Yes~~ / **No**
Number of poles.....:	1P+N, 3P+N
Ambient air temperature (°C) .....:	-25~40°C
Method of mounting.....:	~~surface /~~ **flush** ~~/ panel board~~ / **distribution board**
Method of connection .....:	Terminal with stirrup
Rated residual operating current (A).....:	30, 100, 300mA
Rated current (A) .....:	16, 20, 25, 32, 40, 50, 63
Rated voltage (V).....:	AC240V (AC230V) for 1P+N, AC415V (AC400V) for 3P+N
Rated impulse withstand voltage (U_{imp})	4
Nature of supply.....:	AC
Rated frequency (Hz).....:	50/60
Rated making and breaking capacity (A).....:	1000

Rated residual making and breaking capacity (A) ..... :	1000
Rated conditional short-circuit current (kA)..... :	10
Rated conditional residual short-circuit current (kA).. :	10
Type of terminal ..... :	Terminal with stirrup
Possible test case verdicts:	
- test case does not apply to the test object ..... :	N/A
- test object does meet the requirement..... :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)
Testing..... :	
Date of receipt of test item ..... :	2025-04-08
Date (s) of performance of tests ..... :	2025-04-08 to 2025-07-15

General remarks:

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ Yes ☒ Not applicable

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... : Same as applicant

General product information:

U_n= AC240V (AC230V) for 1P+N, AC415V (AC400V) for 3P+N

Model: HB202B for 1P+N, HB204B for 3P+N

I_n= 16, 20, 25, 32, 40, 50, 63A

$I_{\Delta n}$= 30, 100, 300mA, Type B

I_{nc}=$I_{\Delta c}$= 10kA, I_m=$I_{\Delta m}$= 1kA, 50/60Hz

Independent on line voltage for Type A part

Dependent on line voltage for Type B part

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE A_1 2 samples: 230V/240V, 63A, 30mA, 1P+N 400V415V, 63A, 30mA, 3P+N	**A_1-1**	**A_1-2**	
6.	**Marking**			
	a) manufacturer's name or trademark ..... :	HONI®		P
	b) type designation, catalogue number or serial number ..... :	HB202B	HB204B	P
	c) rated voltage(s) (V) ..... :	230V/240V~	400V/415V~	P
	d) rated frequency (Hz) ..... :	50/60Hz		P
	e) rated current (A) ..... :	63A		P
	f) rated residual operating current (A) ..... :	0,03A		P
	h) rated making and breaking capacity (A) ..... :	1000A		P
	j) degree of protection ..... :			N/A
	k) position of use ..... :			N/A
	l) rated residual making and breaking capacity (A):	1000A		P
	m) symbol S for type S			N/A
	n) symbol of the method of operation ..... :			P
	o) operating means of test device ..... :	T		P
	p) wiring diagram ..... :			P
	q) operating characteristic: ..... :			--
	- RCBOs of type B with the symbol  or 			P
	- RCBOs of type F with the symbol   or 			N/A
	Marking on the RCCB itself or on nameplate or nameplates attached to the RCCB and located so that for small devices at least e), f), o) and q) (only for type A) are legible when the RCCB is installed :	a), b), c), d), e), f), h), l), o), p), q) are legible when installed		P
	Joule integral withstand capacity (A^2s) ..... :			N/A
	Peak current withstand capacity (A) ..... :			N/A
	Time delay when opening in case of failure of the line voltage (s) ..... :	No time delay		N/A
	Open position indicated by "0" and closed position by "I" ..... :	O OFF / I ON		P
	For push-buttons the OFF push-button shall either be red or marked with "0" ..... :			N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	If necessary to distinguish between supply and load terminals they shall be clearly marked ..... :	1P+N: “1, 2”, “N” 3P+N: “1, 3, 5”, “2, 4, 6”, “N”	P
	Terminals for neutral conductor marked by “N”		P
	Terminals for protective conductor marked by [symbol IEC 417-5019 a]		N/A
	Marking indelible, easy legible and not on removable parts		P
9.3	Test: 15 s with water, 15 s with hexane		P
	For universal terminals (rigid-solid, rigid-stranded and flexible conductors:		--
	- no markings		N/A
	For non-universal terminals:		--
	- terminals for rigid-solid conductors only, marked by the letters “s” or “sol”		N/A
	- terminals for rigid (solid and stranded) conductors only, marked by the letter “r”		N/A
	marking on the RCCB or if the space available is not sufficient, on the smallest package unit or in technical information		N/A
8.	**Requirements for construction and operation**		**--**
8.1.1	General		--
	Residual current detection is located between the incoming and outgoing terminals		P
	Not possible to alter the operating characteristics by means of external interventions other than those specifically intended for changing the setting of the residual operating current		P
	Changing from one setting to another shall not be possible without a tool	No such setting	N/A
	In case of an RCCB having multiple settings of residual operating current the rating refers to the highest setting	No multiple setting	N/A
8.1.2	Mechanism		--
	Moving contacts of all poles so mechanically coupled that all poles except the switched neutral, make and break substantially together		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Switched neutral opens after and closes before other poles		P
	Compliance is checked by inspection and by manual tests, using any appropriate means (e.g.: indicator lights, oscilloscope, etc.)		P
	Trip-free mechanism		P
9.15	Test: the RCCB is mounted and wired as in normal use		--
	- test circuit according to fig. 4a		P
	- a residual current equal to 1,5 $I_{\Delta n}$ is passed by closing S2, the RCCB having been closed and the operating means being held in the closed position. The RCCB shall trip	45mA	P
	- test repeated by moving the operating means slowly (1 s) to a position where the current starts to flow. Tripping shall occur without further movement		P
8.1.2	Possible to switch on and off by hand		P
	No intermediate positions of the contacts		P
	In the open position isolation distance in accordance with the requirements necessary to satisfy the isolating function		P
	Indication of the open and closed position of the main contacts shall be provided by one or both of the following means:		--
	- the position of the actuator (this being preferred)		P
	- a separate mechanical indicator		P
	If a separate mechanical indicator is used, this shall show the colour red for the closed position and the colour green for the open position		P
	means of indication of the contact position shall be reliable -checked by inspection and by the tests of 9.15		P
	RCCBs shall be designed so that the actuator, front plate or cover can only be correctly fitted in a manner which ensures correct indication of the contact position -checked by inspection and by the tests of 9.11		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	When means are provided or specified by the manufacturer to lock the operating means in the open position: locking only possible when the main contacts are in the open position	No such lock means	N/A
	If the operating means is used for indication, it shall, when released, automatically take up the position to that of the moving contacts; the operating means shall have two distinct rest positions except that for automatic opening a third distinct position may be provided, when necessary to reset before reclosing		P
	For RCCBs functionally dependent on line voltage, reclosing automatically when the line voltage is restored after failure, the operating means shall remain in the ON position and the contacts shall reclose automatically unless the operating means has been placed in the OFF position		N/A
	When an indicator light is used this shall be lit when the RCCB is in the closed position	No such light	N/A
	The indicator light shall not be the only means to indicate the closed position	No such light	N/A
	The action of the mechanism shall not be influenced by the position of enclosures or covers and shall be independent of any removable part.		P
	If the cover is used as a guiding means for push-buttons, it shall not be possible to remove the buttons from the outside		P
	Operating means securely fixed; not possible to remove them without a tool		P
	For “up-down” operating means the contacts shall be closed by the up movement		P
8.1.4	Screws, current-carrying parts and connections		--
8.1.4.1	Connections withstand mechanical stresses occurring in normal use		P
	Screws for mounting the RCCB are not of thread-cutting type		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.4	Screws and nuts which are operated when mounting and connecting comply with the test of 9.4		P
	Torque test:		--
	- torque (Nm); 5/10 times; diameter (mm) ..... :	2,0Nm; 5 times; 4,9mm	P
8.1.4.2	Screws with a thread of insulating material operated when mounting the RCCB: correct introduction ensured		N/A
8.1.4.3	Electrical connections: contact pressure not transmitted through insulating material unless there is sufficient resilience in the metallic parts		P
8.1.4.4	Current-carrying parts including parts intended for protective conductors, if any, shall be made of a metal having, under the conditions occurring in the equipment, mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use. Examples below:		P
	- copper		N/A
	- an alloy 58% copper for parts worked cold		P
	- an alloy 50% copper for other parts		N/A
	- other metal		N/A
	In case of using ferrous alloys or suitably coated ferrous alloys, compliance to resistance to corrosion is checked by a test of resistance to rusting (see 9.25).		N/A
	The requirements of this subclause do not apply to: contacts, magnetic circuits, heater elements, bimetals, shunts, parts of electronic devices or to screws, nuts, washers, clamping plates, similar parts of terminals and parts of the test circuit		P
8.1.5	Terminals for external conductors		--
	Compliance is checked by inspection and by the tests as relevant for the type of connection:		P
	9.5 for screw-type terminals		P
	by specific tests for plug-in or bolt-on RCCBs included in the standard		N/A
	by the tests of Annexes J, K or L		N/A
8.1.5.1	Terminals ensure the necessary contact pressure		P
9.5	Torque test:		--
	- torque (Nm); diameter (mm) ..... :	2,0Nm, 4,9mm	P
	- max. cross-sectional area (mm²) ..... :		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.5.1	Pull test:		--
	Terminal shall be suitable for all types of conductors: rigid (solid or stranded) and flexible, unless otherwise specified by the manufacturer.		--
	Min. cross-section solid / stranded / flexible (mm²):	1 /1 /1mm²	--
	Max. cross-section solid / stranded / flexible (mm²):	6/25/16mm²	--
	Torque 2/3 (Nm)....:	1,33Nm	--
	Pull for 1 min solid / stranded / flexible (N)....:	Solid: 50N for 1/6mm² Stranded: 50N for 1mm² 100N for 25mm² Flexible: 50N for 1mm² 90N for 16mm²	P
	During the test no noticeable move of conductor		P
9.5.2	Torque test:		--
	- torque (2/3) (Nm) ..... :	1,33Nm	--
	- min. cross-sectional area (mm²) ..... :	1mm²	--
	- max. cross-sectional area (mm²) ..... :	25mm²	--
	The conductor shows no damage		P
	Terminals have not worked loose and no damage		P
9.5.3	Terminals fitted with the largest cross-section area specified in Table 6, for stranded and/or flexible copper conductor.		--
	Max. cross-section stranded (mm²)....:	25 mm²	--
	Max. cross-section flexible (mm²)....:	16mm²	--
	Torque 2/3 (Nm)....:	1,33Nm	--
	After the test no strand of conductor escaped outside		P
8.1.5.2	RCCBs shall be provided with:		--
	- terminals which shall allow the connection of copper conductors having nominal cross-sectional areas as shown in Table 6		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A) / Range of nominal cross sections to be clamped* (mm²): Rigid (solid or stranded) conductors / Flexible conductors ~~≤ 13 — 1 to 2,5 — 1 to 2,5~~ > 13 ≤ 16 — 1 to 4 — 1 to 4 > 16 ≤ 25 — 1,5 to 6 — 1,5 to 6 > 25 ≤ 32 — 2,5 to 10 — 2,5 to 6 > 32 ≤ 50 — 4 to 16 — 4 to 10 > 50 ≤ 80 — 10 to 25 — 10 to 16 ~~> 80 ≤ 100 — 16 to 35 — 16 to 25~~ ~~> 100 ≤ 125 — 24 to 50 — 25 to 35~~	1 to 25mm² (stranded) 1 to 16mm² (Flexible)	P
	*It is required that, for current ratings up to and including 50 A, terminals be designed to clamp solid conductors as well as rigid stranded conductors. Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm² up to 6 mm² be designed to clamp solid conductors only.		P
	- or terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors according to Annex L.		N/A
8.1.5.3	Means for clamping the conductors in the terminals do not serve to fix any other component (see tests of 9.5)		P
8.1.5.4	Terminals for In ≤ 32 A allow the connection of conductors without special preparation		P
8.1.5.5	Terminals shall have adequate mechanical strength and metric ISO thread or equivalent (see tests of 9.4 and 9.5.1)		P
8.1.5.6	Clamping of conductor without undue damage to conductor (see tests of 9.5.2)		P
8.1.5.7	Clamping of conductor reliably and between metal surfaces (see tests of 9.4 and 9.5.1)		P
8.1.5.8	Terminals so designed or positioned that no conductor can slip out while the clamping screws or nuts are tightened (see tests of 9.5.3.)		P
8.1.5.9	Terminals so fixed or located that they do not work loose when the clamping screws or nuts are tightened or loosened (see tests of 9.4)		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
8.1.5.10	Clamping screws or nuts of terminals for the protective conductors adequately secured against accidental loosening and not possible to unclamp without a tool		N/A
8.1.5.11	Screws and nuts of terminals for external conductors shall be in engagement with a metal thread and the screws shall not be of the tapping screw type		P
8.2	Protection against electric shock		--
	Live parts not accessible in normal use		P
	For RCCBs other than plug-in type, external parts, other than screws or other means for fixing covers, which are accessible in normal use shall be of insulating material or be lined throughout with insulating material		P
	Lining reliably fixed		N/A
	Lining has adequate thickness and mechanical strength		N/A
	Inlet openings for cables or conduits shall be of insulating material or be provided with bushings or similar devices of insulating material		N/A
	Such devices shall be reliably fixed		N/A
	Such devices shall have adequate mechanical strength		N/A
	For plug-in RCCBs, external parts, other than screws or other means for fixing covers, which are accessible, shall be of insulating material		N/A
	Metallic operating means insulated from live parts		N/A
	Metal parts of the mechanism not accessible, insulated from accessible metal parts, from metal frames (for flush-type), from screws or other means for fixing the base and from metal plates		P
	Possible to replace plug-in RCCBs easily without touching live parts		N/A
	Lacquer or enamel not considered to provide adequate insulation		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.6	Test: verify with test finger, 1 min with a force of 75 N		P
	Enclosures or covers not deformed to such an extent that live parts can be touched		P
8.9	Resistance to heat		--
	RCCB sufficiently resistant to heat		P
9.13.1	Test: 1 h; test temperature (°C): (100 ± 2) °C for not removable covers or (70 ± 2)°C for removable covers ..... :	100 °C ~~/ 70 °C~~	P
	No change impairing further use and no flow of sealing compound so that live parts are exposed		P
	No access to live parts even if the test finger is applied with a force not exceeding 5 N		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms)..... :	37,5mA, 176/109ms	P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms)..... :	75mA, 42/38ms	P
	Marking still legible after test		P
9.13.2	Ball-pressure test for external parts of insulating material (parts retaining live parts in position); test temperature: 125 °C ± 2°C for 1 h; diameter of impression (mm): ≤ 2 mm ..... :	1,5 mm(Enclosure)	P
9.13.3	Ball-pressure test for external parts of insulating material (parts not retaining live parts in position); test temperature (°C): (70 ± 2)°C or (40 ± 2) °C + max. temperature rise of 9.8; diameter of impression (mm): ≤ 2 mm ..... :	1,2 mm(Handle)	P
8.1.3	Clearances and creepage distances (internal and external parts)		--
	The minimum required clearances and creepage distances are based on the RCCB being designed for operating in an environment with pollution degree 2		P
	Compliance for item 1 in is checked by measurement and by the test of 9.7.7.4.1 and 9.7.7.4.2. The test is carried out with samples not submitted to the humidity treatment described in 9.7.1.		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	The clearances of items 2 and 4 may be reduced provided that the measured clearances are not shorter than the minimum allowed in IEC 60664-1 for homogenous field conditions.		P
	In this case, after the humidity treatment in 9.7.1, compliance for item 2 and 4 and arrangements of 9.7.2 items b), c), d) and e) is checked:		--
	- Tests according to 9.7.2 to 9.7.6 as applicable		N/A
	- Test according to 9.7.7.2 with test voltages acc. Table 16 with test arrangements of 9.7.2 items b), c), d), e)		N/A
	If measurement does not show any reduced clearance, test 9.7.7.2 is not applied		P
	Compliance for item 3, checked by measurement		P
	Parts of PCBs connected to the live parts protected against pollution by the use of a type 2 protection according to IEC 60664-3 are exempt from this verification		P
	The insulating materials are classified into Material Groups on the basis of their comparative tracking index (CTI) acc. to IEC 60664-1 and measured according to IEC 60112	Group IIIa, 175V	P
	Clearances [mm] U_{imp}		--
	4kV (see table 5) ☒ **2,5kV(see table 5)** ☐		--
	Minimum clearances (see table 5)		--
		minimum clearances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	4,8	P
	2. between live parts of different polarity	6,8	P
	3. between circuits supplied from different sources, one of which being PELV or SELV		N/A
	4. between live parts and:		--
	- accessible surfaces of operating means	>10	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB		N/A
	- surface on which the RCCB is mounted	>10	P
	- screws or other means for fixing the RCCB		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts		N/A
	- metal frames supporting flush-type RCCBs		N/A
	Minimum creepage distances (see table 5)		--

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Clause	Requirement + Test	Result - Remark	Verdict
	Material group	IIIb ☐ IIIa ☒ II ☐ I ☐	--
		minimum creepage distances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	>5	P
	2. between live parts of different polarity	6,8	P
	3. between circuits supplied from different sources, one of which being PELV or SELV		N/A
	4. between live parts and:		
	- accessible surfaces of operating means	>10	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB		N/A
	- surface on which the RCCB is mounted	>10	P
	- screws or other means for fixing the RCCB		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts		N/A
	- metal frames supporting flush-type RCCBs		N/A
9.25	Test of resistance to rusting:		--
	- 10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		P
	- 10 min immersed in a 10% solution of ammonium chloride in water at 20°C±5°C		P
	- 10 min in a box containing air saturated with moisture at 20°C±5°C		P
	- 10 min at 100°C		P
	No sign of rust		P

	TEST SEQUENCE A_2 3 samples: 230V/240V, 63A, 30mA, 1P+N 3 samples: 400V415V, 63A, 30mA, 3P+N	**A_2-1~A_2-3** **A_2-4~A_2-6**	--
8.10	Resistance to abnormal heat and fire		
	External parts of insulating material shall not be liable to ignite and to spread fire under fault or overload conditions		P
9.14	Glow wire test		--
	Test performed on a complete RCCB		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Glow-wire test: (960 + 15) °C for external parts of insulating material retaining current-carrying parts or parts of the protective circuit in position	Enclosure	P
	Glow-wire test: (650 + 10) °C for all other external parts insulating material	Handle	P
	No visible flames, no sustained glowing, or	No visible flame (Handle)	P
	flames and glowing extinguish within 30 s after removal .....:	6,5s(Enclosure)	P
	No ignition of tissue paper or scorching of the pinewood board		P

	TEST SEQUENCE B 3+1 samples: 230V/240V, 63A, 30mA, 1P+N	**B1 ~ B4**	
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		
8.3	DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
	RCCBs have adequate dielectric properties		P
9.7	TEST OF DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
9.7.7.4	VERIFICATION OF RESISTANCE OF THE INSULATION OF OPEN CONTACT AND BASIC INSULATION AGAINST AN IMPULSE VOLTAGE IN NORMAL CONDITIONS		--
	These tests are not preceded by the humidity treatment described in 9.7.1.		P
	The test is carried out on an RCCB fixed on a metal support		P
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2μs, and a time to half-value of 50μs		P
	The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator.		P
	For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.		N/A
	rated impulse withstand voltage [kV]:	4,0	--
	see level of test laboratory [m]	5	--
	test voltage (acc. Table 22) [kV]:	6,2	--
9.7.7.4.2	RCCB in open position (contacts in open position)		P
	The impulses are applied between:		--
	the line terminals connected together and the load terminals connected together		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.7.7.4.3	RCCB in closed position		P
	All components bridging the basic insulation disconnected		P
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		P
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the RCCB		P
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.		P
	no disruptive discharges during the test		P
9.7.7.5	VERIFICATION OF THE BEHAVIOUR OF COMPONENTS BRIDGING THE BASIC INSULATION		--
	A new RCCB sample is tested		P
	Test only performed on RCCBs, where components bridging the basic insulation have been disconnected during the impulse voltage test of 9.7.7.4.3		P
	test voltage 1200V+U_0	1440V	P
	The voltage is applied during 5s between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the prospective conductor(s), if any		P
	after test, no component bridging the basic insulation should show a visible alteration.		P
	Then, the equipment is connected to the mains acc. manufacturer's instruction		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$	[ms]	--
		B4– 189	P
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1.		P
9.7.1	RESISTANCE TO HUMIDITY		--
9.7.1.1	Parts which can be removed without a tool are removed, spring lids kept open, inlet openings are left open and if knock-outs one is opened.		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.7.1.2	Test conditions: 48 h in humidity cabinet RH = 91% to 95% T = 20 to 30°C ± 1°C	23,6°C 93,3%	--
9.7.1.4	The samples show no damage		P
9.7.2	Insulation resistance of the main circuit measured between 30 and 60 min after this treatment with 500 V DC after 5 s:		--
	a) between the terminals which are electrically connected together when the RCCB is in the closed position.....≥ 2 MΩ	B1 - >500 MΩ B2 - >500 MΩ B3 - >500 MΩ	P
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected) .....≥ 2 MΩ	B1 - >500 MΩ B2 - >500 MΩ B3 - >500 MΩ	P
	c) between all poles connected together and the frame .....≥ 5 MΩ	B1 - >500 MΩ B2 - >500 MΩ B3 - >500 MΩ	P
	d) between metal parts of the mechanism and the frame .....≥ 5 MΩ	B1 - B2 - B3 -	N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material.....≥ 5 MΩ	B1 - B2 - B3 -	N/A
9.7.3	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:		--
	a) electronic components disconnected .....2000 V	B1 - OK B2 - OK B3 - OK	P
	b) electronic components disconnected .....2000 V	B1 - OK B2 - OK B3 - OK	P
	c) electronic components disconnected.....2000 V	B1 - OK B2 - OK B3 - OK	P
	d) electronic components disconnected .....2000 V	B1 - B2 - B3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	e) electronic components disconnected .....2500 V	B1 - B2 - B3 -	N/A
	No flashover or breakdown		P
9.7.4	Insulation resistance of auxiliary circuits measured with 500 V DC after 1 min:		--
	1) between all auxiliary circuits and the frame .....≥ 2 MΩ	B1 - B2 - B3 -	N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together .....≥ 2 MΩ	B1 - B2 - B3 -	N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:		--
	Rated voltage of auxiliary circuits (a.c. or d.c.) — Test voltage (V) ≤ 30 — 600 > 30 ≤ 50 — 1000 > 50 ≤ 110 — 1500 > 110 ≤ 250 — 2000 > 250 ≤ 500 — 2500	V	--
	1) between all auxiliary circuits and the frame	B1 - B2 - B3 -	N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together	B1 - B2 - B3 -	N/A
	No flashover or perforation		N/A
9.7.7.2	Verification of clearances with the impulse withstand voltage		--
	If the measurement of clearances of items 2 and 4 in Table 5 shows a reduction of the required length, this test applies.	No such reduction of required length	--
	The test is carried out on an RCCB fixed on a metal support and being in the closed position		N/A
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2μs, and a time to half-value of 50μs		N/A
	The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.		N/A
	test performed with:		--
	- surge impedance of the test apparatus ≤500Ω and surge protective devices disconnected before testing or		N/A
	- hybrid generator with an surge impedance of 2 Ω and surge protective devices not disconnected before testing		N/A
	rated impulse withstand voltage [kV]:		--
	see level of test laboratory [m]		--
	test voltage (acc. Table 16) [kV]:		--
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		N/A
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the RCCB		N/A
	A third series of tests is made applying the impulse voltage between (and not tested during the two first sequences described here above):		N/A
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected)	B1 - B2 - B3 -	N/A
	c) between all poles connected together and the frame	B1 - B2 - B3 -	N/A
	d) between metal parts of the mechanism and the frame	B1 - B2 - B3 -	N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material	B1 - B2 - B3 -	N/A
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.		N/A

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Clause	Requirement + Test						Result - Remark				Verdict
	no disruptive discharges during the test										N/A
9.7.5	Secondary circuit of detection transformers										--
	No insulation test, provided that no connection with accessible metal parts or with protective conductor or live parts exists.										N/A
9.7.6	Capability of control circuits connected to the main circuit of withstanding high DC voltages due to insulation measurements										--
	RCCB fixed on metal support in closed position with all control circuits connected as in service.										P
	Open test voltage 600 V +25 / -0 V Maximum ripple 5% Short-circuit current 12 mA +2 / -0 mA Applied for 1 min between each pole and the other poles connected together to the frame.						B1 – 600V B2 – 600V B3 – 600V				P
	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							--
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A[a)]	5A-200A[b)]	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--
	a) value to be decided by the manufacturer for this test										--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4										--
9.9.2.3	Verification of the correct operation in case of sudden appearance of residual current by closing S_1, (S_2 and RCCB in closed position):										P
	Maximum break times (ms) at:										--
	- $I_{\Delta N}$						B1 - 198 B2 - 200 B3 - 198				P
	- 2 $I_{\Delta N}$						B1 - 74 B2 - 69 B3 - 70				P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 5 $I_{\Delta N}$ or	B1 - 26 B2 - 27 B3 - 28	P
	- 0,25 A	B1 - B2 - B3 -	N/A
	- $I_{\Delta t}$ 500 A	B1 - 20 B2 - 16 B3 - 18	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	Minimum non-actuating time at:		--
	- $I_{\Delta N}$ .....0,13 s	B1 - B2 - B3 -	N/A
	- 2 $I_{\Delta N}$ .....0,06 s	B1 - B2 - B3 -	N/A
	- 5 $I_{\Delta N}$ .....0,05 s	B1 - B2 - B3 -	N/A
	- $I_{\Delta t}$ .....0,04 s	B1 - B2 - B3 -	N/A
	The test switch S_1 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_2 for min. non-operating times acc. table 2		N/A
	No tripping during tests		N/A
8.4	Temperature rise		--
	Temperature rises do not exceed the limiting values stated in table 7.		P
	Cross-section (mm²)	16 mm²	--
9.8.1	Ambient air temperature (°C)	22,0°C	--
9.8.2	Test current I_N (A) until steady state values are reached.	63A	--
	Four pole RCCBs:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Current passing through		--
	- 3 phase poles (1)		N/A
	- neutral and adjacent pole (2)		N/A
	Parts ..... Temperature rise K		--
	Terminals for external connections 65K	B1 – 49,2 B2 – 49,5 B3 – 47,4	P
	External parts liable to be touched during manual operation of the RCCB, including operating means of insulating material and metallic means for coupling insulated operating means of several poles 40K	B1 – 13,6 B2 – 12,7 B3 – 11,9	P
	External metallic parts of operating means 25K	B1 - B2 - B3 -	N/A
	Other external parts, including that face of the RCCB in direct contact with the mounting surface 60K	B1 – 35,8 B2 – 35,8 B3 – 35,0	P
8.16	Reliability		--
	RCCBs operate reliably even after long service.		P
9.22.2	Test with 28 cycles at 40 ± 2°C	40°C 28 cycles	--
	Cross-section (mm²) ..... :	16 mm²	--
	Torque $^2/_3$ (Nm) ..... :	1,33Nm	--
	Test current I_N (A) ..... :	63A	--
	- with current passing ..... 21 h	21h	P
	- without current ..... 3 h	3h	P
	For 4 pole RCCBs with 3 overcurrent protected poles only 3 poles loaded		N/A
	At the end of the last period of 21 h with current passing the temperature rise of the terminals shall not exceed 65K	B1 – 53,6 B2 – 54,2 B3 – 52,9	P
	After cool down the RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time (ms) not exceeding the value for $I_{\Delta N}$ in table 2	B1 – 183 B2 – 176 B3 – 185	P
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1.		P
9.23	Verification of ageing of electronic components		--
	168 h at 40 ± 2°C ..... :	40°C	--

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current I_N (A) ..... :	63,0A	--
	Cross-section (mm²) ..... :	16 mm²	--
	Electronic parts at 1,1 U_N ..... :	264V	--
	After cool down:		--
	- electronic parts show no damage		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time (ms) not exceeding the value for $I_{\Delta N}$ in table 2	B1 – 176 B2 – 185 B3 – 194	--
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1		P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current (ms)	75mA	--
		B1 – 107 B2 – 96 B3 – 105	P

	TEST SEQUENCE B 3+1 samples: 400V415V, 63A, 30mA, 3P+N	**B5 ~ B8**	--
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		
8.3	DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
	RCCBs have adequate dielectric properties		P
9.7	TEST OF DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
9.7.7.4	VERIFICATION OF RESISTANCE OF THE INSULATION OF OPEN CONTACT AND BASIC INSULATION AGAINST AN IMPULSE VOLTAGE IN NORMAL CONDITIONS		--
	These tests are not preceded by the humidity treatment described in 9.7.1.		P
	The test is carried out on an RCCB fixed on a metal support		P
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2μs, and a time to half-value of 50μs		P
	The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator.		P
	For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.		N/A
	rated impulse withstand voltage [kV]:	4,0	--
	see level of test laboratory [m]	5	--

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Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (acc. Table 22) [kV]:	6,2	--
9.7.7.4.2	RCCB in open position (contacts in open position)		P
	The impulses are applied between:		--
	the line terminals connected together and the load terminals connected together		P
9.7.7.4.3	RCCB in closed position		P
	All components bridging the basic insulation disconnected		P
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		P
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the RCCB		P
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.		P
	no disruptive discharges during the test		P
9.7.7.5	VERIFICATION OF THE BEHAVIOUR OF COMPONENTS BRIDGING THE BASIC INSULATION		--
	A new RCCB sample is tested		P
	Test only performed on RCCBs, where components bridging the basic insulation have been disconnected during the impulse voltage test of 9.7.7.4.3		P
	test voltage 1200V+U_0	1440V	P
	The voltage is applied during 5s between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the prospective conductor(s), if any		P
	after test, no component bridging the basic insulation should show a visible alteration.		P
	Then, the equipment is connected to the mains acc. manufacturer's instruction		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$	[ms]	--
		B8 – 109	P
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1.		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.7.1	RESISTANCE TO HUMIDITY		--
9.7.1.1	Parts which can be removed without a tool are removed, spring lids kept open, inlet openings are left open and if knock-outs one is opened.		P
9.7.1.2	Test conditions: 48 h in humidity cabinet RH = 91% to 95% T = 20 to 30°C ± 1°C	23,6°C 93,3%	--
9.7.1.4	The samples show no damage		P
9.7.2	Insulation resistance of the main circuit measured between 30 and 60 min after this treatment with 500 V DC after 5 s:		--
	a) between the terminals which are electrically connected together when the RCCB is in the closed position.....≥ 2 MΩ	B5 - >500 MΩ B6 - >500 MΩ B7 - >500 MΩ	P
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected) .....≥ 2 MΩ	B5 - >500 MΩ B6 - >500 MΩ B7 - >500 MΩ	P
	c) between all poles connected together and the frame.....≥ 5 MΩ	B5 - >500 MΩ B6 - >500 MΩ B7 - >500 MΩ	P
	d) between metal parts of the mechanism and the frame .....≥ 5 MΩ	B5 - B6 - B7 -	N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material.....≥ 5 MΩ	B5 - B6 - B7 -	N/A
9.7.3	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:		--
	a) electronic components disconnected .....2000 V	B5 - OK B6 - OK B7 - OK	P
	b) electronic components disconnected .....2000 V	B5 - OK B6 - OK B7 - OK	P
	c) electronic components disconnected.....2000 V	B5 - OK B6 - OK B7 - OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) electronic components disconnected .....2000 V	B5 - B6 - B7 -	N/A
	e) electronic components disconnected .....2500 V	B5 - B6 - B7 -	N/A
	No flashover or breakdown		P
9.7.4	Insulation resistance of auxiliary circuits measured with 500 V DC after 1 min:		--
	1) between all auxiliary circuits and the frame .....≥ 2 MΩ	B5 - B6 - B7 -	N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together.....≥ 2 MΩ	B5 - B6 - B7 -	N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:		--
	Rated voltage of auxiliary circuits (a.c. or d.c.) — Test voltage (V) ≤ 30 — 600 > 30 ≤ 50 — 1000 > 50 ≤ 110 — 1500 > 110 ≤ 250 — 2000 > 250 ≤ 500 — 2500	V	--
	1) between all auxiliary circuits and the frame	B5 - B6 - B7 -	N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together	B5 - B6 - B7 -	N/A
	No flashover or perforation		N/A
9.7.7.2	Verification of clearances with the impulse withstand voltage		--
	If the measurement of clearances of items 2 and 4 in Table 5 shows a reduction of the required length, this test applies.	No such reduction of required length	--
	The test is carried out on an RCCB fixed on a metal support and being in the closed position		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2μs, and a time to half-value of 50μs		N/A
	The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator.		N/A
	For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.		N/A
	test performed with:		--
	- surge impedance of the test apparatus ≤500Ω and surge protective devices disconnected before testing or		N/A
	- hybrid generator with an surge impedance of 2 Ω and surge protective devices not disconnected before testing		N/A
	rated impulse withstand voltage [kV]:		--
	see level of test laboratory [m]		--
	test voltage (acc. Table 16) [kV]:		--
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		N/A
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the RCCB		N/A
	A third series of tests is made applying the impulse voltage between (and not tested during the two first sequences described here above):		N/A
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected)	B5 - B6 - B7 -	N/A
	c) between all poles connected together and the frame	B5 - B6 - B7 -	N/A
	d) between metal parts of the mechanism and the frame	B5 - B6 - B7 -	N/A

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Clause	Requirement + Test					Result - Remark					Verdict
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material					B5 - B6 - B7 -					N/A
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.										N/A
	no disruptive discharges during the test										N/A
9.7.5	Secondary circuit of detection transformers										--
	No insulation test, provided that no connection with accessible metal parts or with protective conductor or live parts exists.										N/A
9.7.6	Capability of control circuits connected to the main circuit of withstanding high DC voltages due to insulation measurements										--
	RCCB fixed on metal support in closed position with all control circuits connected as in service.										P
	Open test voltage 600 V +25 / -0 V Maximum ripple 5% Short-circuit current 12 mA +2 / -0 mA Applied for 1 min between each pole and the other poles connected together to the frame.					B5 – 600V B6 – 600V B7 – 600V					P
	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							--
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A[a)]	5A-200A[b)]	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--
	a) value to be decided by the manufacturer for this test										--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4										--
9.9.2.3	Verification of the correct operation in case of sudden appearance of residual current by closing S_1, (S_2 and RCCB in closed position):										P
	Maximum break times (ms) at:										--

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Clause	Requirement + Test	Result - Remark	Verdict
	- $I_{\Delta N}$	B5 – 120 B6 – 115 B7 – 117	P
	- 2 $I_{\Delta N}$	B5 – 50 B6 – 48 B7 – 46	P
	- 5 $I_{\Delta N}$ or	B5 – 23 B6 – 25 B7 – 21	P
	- 0,25 A	B5 - B6 - B7 -	N/A
	- $I_{\Delta t}$ 500 A	B5 – 17 B6 – 18 B7 – 21	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	Minimum non-actuating time at:		--
	- $I_{\Delta N}$ .....0,13 s	B5 - B6 - B7 -	N/A
	- 2 $I_{\Delta N}$ .....0,06 s	B5 - B6 - B7 -	N/A
	- 5 $I_{\Delta N}$ .....0,05 s	B5 - B6 - B7 -	N/A
	- $I_{\Delta t}$ .....0,04 s	B5 - B6 - B7 -	N/A
	The test switch S_1 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_2 for min. non-operating times acc. table 2		N/A
	No tripping during tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.4	Temperature rise		--
	Temperature rises do not exceed the limiting values stated in table 7.		P
	Cross-section (mm²)	16 mm²	--
9.8.1	Ambient air temperature (°C)	22,0°C	--
9.8.2	Test current I_N (A) until steady state values are reached.	63A	--
	Four pole RCCBs:		P
	Current passing through		--
	- 3 phase poles (1)		P
	- neutral and adjacent pole (2)		P
	Parts ..... Temperature rise K		--
	Terminals for external connections 65K	B5 – 52,8 B6 – 52,8 B7 – 54,8	P
	External parts liable to be touched during manual operation of the RCCB, including operating means of insulating material and metallic means for coupling insulated operating means of several poles.....40K	B5 – 16,5 B6 – 16,0 B7 – 15,5	P
	External metallic parts of operating means.....25K	B5 - B6 - B7 -	N/A
	Other external parts, including that face of the RCCB in direct contact with the mounting surface.....60K	B5 – 45,6 B6 – 45,9 B7 – 43,7	P
8.16	Reliability		--
	RCCBs operate reliably even after long service.		P
9.22.2	Test with 28 cycles at 40 ± 2°C	40°C 28 cycles	--
	Cross-section (mm²) ..... :	16 mm²	--
	Torque $^2/_3$ (Nm) ..... :	1,33Nm	--
	Test current I_N (A) ..... :	63A	--
	- with current passing ..... 21 h	21h	P
	- without current..... 3 h	3h	P
	For 4 pole RCCBs with 3 overcurrent protected poles only 3 poles loaded		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	At the end of the last period of 21 h with current passing the temperature rise of the terminals shall not exceed 65K	B5 – 58,5 B6 – 56,9 B7 – 59,2	P
	After cool down the RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time (ms) not exceeding the value for $I_{\Delta N}$ in table 2	B5 – 108 B6 – 111 B7 – 105	P
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1.		P
9.23	Verification of ageing of electronic components		--
	168 h at 40 ± 2°C ..... :	40°C	--
	Test current I_N (A) ..... :	63,0A	--
	Cross-section (mm²) ..... :	16 mm²	--
	Electronic parts at 1,1 U_N ..... :	457V	--
	After cool down:		--
	- electronic parts show no damage		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time (ms) not exceeding the value for $I_{\Delta N}$ in table 2	B5 – 104 B6 – 115 B7 – 111	--
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1		P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current (ms)	75mA	--
		B5 – 102 B6 – 94 B7 – 89	P

	TEST SEQUENCE C 3 samples: 230V/240V, 63A, 30mA, 1P+N	**C-1**	**C-2**	**C-3**	
8.6	**Mechanical and electrical endurance**				
	RCCBs shall be capable of performing an adequate number of mechanical and electrical operations				P
9.10	Test is made:				--
	- In ≤ 25 A; 2 s on; 13 s off .....:				N/A
	- In > 25 A; 2 s on; 28 s off .....:	2 s on; 28 s off			P
	Number of operating cycles: 2000	2000			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Test voltage Un (V); test current In (A); cos phi 0,85-0,9 .....:	242V 63,8A 0,88	--
	Cross-sectional area (mm²) .....:	16	--
	RCCBs having $I_{\Delta n}$ > 0,010 A tested at:		--
	- 1000 cycles for manual operation .....:	C1 – OK C2 – OK C3 – OK	P
	- 500 cycles by using the test device .....:	C1 – OK C2 – OK C3 – OK	P
	- 500 cycles at a current of $I_{\Delta n}$ .....:	C1 – OK C2 – OK C3 – OK	P
	RCCBs having $I_{\Delta n} \leq$ 0,010 A tested at:		--
	- 500 cycles for manual operation .....:	C1 - C2 - C3 -	N/A
	- 750 cycles by using the test device .....:	C1 - C2 - C3 -	N/A
	- 750 cycles at a current of $I_{\Delta n}$ .....:	C1 - C2 - C3 -	N/A
	Test is made without load using manual operation:		--
	- In ≤ 25 A; 2000 cycles .....:	C1 - C2 - C3 -	N/A
	- In > 25 A; 1000 cycles .....:	C1 - C2 - C3 -	P
	After the test:		--
	- no undue wear		P
	- no damage		P
	- no loosening of connections		P
	- no seepage of sealing compound		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	C1 – 175 C2 – 181 C3 – 174	P
	Dielectric strength test at a voltage of 900 V a.c. for 1 min:		--
	a) .....:	C1 – OK C2 – OK C3 – OK	P
	b) .....:	C1 – OK C2 – OK C3 – OK	P
	c) .....:	C1 – OK C2 – OK C3 – OK	P
	d) .....:	C1 - C2 - C3 -	N/A
	e) .....:	C1 - C2 - C3 -	N/A
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	C1 – 108 C2 – 92 C3 – 95	P

	TEST SEQUENCE C 3 samples: 400V/415V, 63A, 30mA, 3P+N	**C-4**	**C-5**	**C-6**	
8.6	**Mechanical and electrical endurance**				--
	RCCBs shall be capable of performing an adequate number of mechanical and electrical operations				P
9.10	Test is made:				--
	- In ≤ 25 A; 2 s on; 13 s off .....:				N/A
	- In > 25 A; 2 s on; 28 s off .....:	2 s on; 28 s off			P
	Number of operating cycles: 2000	2000			P
	Test voltage Un (V); test current In (A); cos phi 0,85-0,9 .....:	419V 63,5A 0,87			--
	Cross-sectional area (mm²) .....:	16			--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs having $I_{\Delta n}$ > 0,010 A tested at:		--
	- 1000 cycles for manual operation .....:	C4 – OK C5 – OK C6 – OK	P
	- 500 cycles by using the test device .....:	C4 – OK C5 – OK C6 – OK	P
	- 500 cycles at a current of $I_{\Delta n}$ .....:	C4 – OK C5 – OK C6 – OK	P
	RCCBs having $I_{\Delta n} \leq$ 0,010 A tested at:		--
	- 500 cycles for manual operation .....:	C4 - C5 - C6 -	N/A
	- 750 cycles by using the test device .....:	C4 - C5 - C6 -	N/A
	- 750 cycles at a current of $I_{\Delta n}$ .....:	C4 - C5 - C6 -	N/A
	Test is made without load using manual operation:		--
	- In ≤ 25 A; 2000 cycles .....:	C4 - C5 - C6 -	N/A
	- In > 25 A; 1000 cycles .....:	C4 - C5 - C6 -	P
	After the test:		--
	- no undue wear		P
	- no damage		P
	- no loosening of connections		P
	- no seepage of sealing compound		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	C4 – 98 C5 – 105 C6 – 101	P
	Dielectric strength test at a voltage of 900 V a.c. for 1 min:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	a) .....:	C4 – OK C5 – OK C6 – OK	P
	b) .....:	C4 – OK C5 – OK C6 – OK	P
	c) .....:	C4 – OK C5 – OK C6 – OK	P
	d) .....:	C4 - C5 - C6 -	N/A
	e) .....:	C4 - C5 - C6 -	N/A
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	C4 – 87 C5 – 96 C6 – 99	P

	TEST SEQUENCE D 3 samples: 230V/240V, 63A, 30mA, 1P+N	**D-1**	**D-2**	**D-3**	
	Tests "D0"				
8.5	Operating characteristics				--
	For multiple settings of $I_{\Delta n}$ tests are made for each setting				N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4				P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) .....:	Independent of line voltage for Type A part. Tested at both 50Hz and 60Hz Dependent on line voltage for Type B part. Tested at 0,8x230=184V 1,1x240=264V Tested at both 50Hz and 60Hz			P

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A[a)]	5A-200A[b)]	500A		--
											--

IEC 62423											
Clause	Requirement + Test									Result - Remark	Verdict
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--
	a) value to be decided by the manufacturer for this test										--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4										--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C										P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:										--
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ..... :									D1 – 6~30mA D2 – 6~30mA D3 – 6~30mA	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ..... :									D1 – 22,0 ~ 23,0 D2 – 22,0 ~ 23,2 D3 – 22,1 ~ 22,7	P
9.9.2.2	Verification of the correct operation at closing on residual current										--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ..... :									D1 – 201 D2 – 192 D3 – 196	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1										--
	- maximum break time (ms) at: $I_{\Delta n}$ ..... :									D1 – 186 D2 – 195 D3 – 195	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :									D1 – 66 D2 – 70 D3 – 67	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ..... :									D1 - 27 D2 - 28 D3 - 28	P
	- maximum break time (ms) at: 0,25 A (if applicable) ..... :									D1 – D2 – D3 –	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 500 A ..... :	D1 – 18 D2 – 21 D3 – 18	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A (among the following list: 5A, 10A, 20A, 50A, 100A, 200A):		--
	The test switch S_1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S_2		--
	- maximum break time (ms) at: 5A (value 1 between 5A and 200A) ..... :	D1 – 15 D2 – 14 D3 – 17	P
	- maximum break time (ms) at:10A (value 2 between 5A and 200A) ..... :	D1 – 16 D2 – 18 D3 – 16	P
	- maximum break time (ms) at:20A (value 3 between 5A and 200A) ..... :	D1 – 15 D2 – 15 D3 – 18	P
	- maximum break time (ms) at:50A (value 4 between 5A and 200A) ..... :	D1 – 13 D2 – 16 D3 – 15	P
	- maximum break time (ms) at:100A (value 5 between 5A and 200A) ..... :	D1 – 14 D2 – 13 D3 – 18	P
	- maximum break time (ms) at:200A (value 6 between 5A and 200A) ..... :	D1 – 15 D2 – 16 D3 – 16	P
	- maximum break time (ms) at:500A ..... :	D1 – 18 D2 – 15 D3 – 17	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ..... :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ..... :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ..... :	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.2.6	a) Tests repeated at a temperature of -5 °C:		--
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		--
	- maximum break time (ms) at: $I_{\Delta n}$ ..... :	D1 – 192 D2 – 191 D3 – 191	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 – 74 D2 – 72 D3 – 73	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ..... :	D1 - 27 D2 - 26 D3 - 23	P
	- maximum break time (ms) at: 0,25 A (if applicable) ..... :	D1 – D2 – D3 –	N/A
	- maximum break time (ms) at: 500 A ..... :	D1 – 18 D2 – 18 D3 – 16	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ..... :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ..... :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ..... :	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.2.5	Tests repeated with the RCCB loaded with rated current:		--
	- test current (A): In, the pole under test and one other pole loaded with rated current, the current being established shortly before the test ..... :	63A	--
	- cross-sectional area (mm²) ..... :	16	--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ..... :	D1 – 194 D2 – 198 D3 – 195	P
	The switch S_1 and the RCCB are in closed position. The residual current is established by closing S_2 :		--
	- maximum break time (ms) at: $I_{\Delta n}$ ..... :	D1 – 192 D2 – 195 D3 – 196	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 – 74 D2 – 71 D3 – 73	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ..... :	D1 - 26 D2 - 27 D3 - 28	P
	- maximum break time (ms) at: 0,25 A (if applicable) ..... :	D1 – D2 – D3 –	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 500 A ..... :	D1 – 21 D2 – 21 D3 – 16	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ..... :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ..... :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ..... :	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.2.6	b) Tests repeated with the RCCB loaded with rated current:		--
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ..... :	63	--
	- cross-sectional area (mm²) ..... :	16	--
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ ..... :	D1 – 192 D2 – 193 D3 – 195	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 – 71 D2 – 75 D3 – 68	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ..... :	D1 - 27 D2 - 28 D3 - 26	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ..... :	D1 – D2 – D3 –	N/A
	- maximum break time (ms) at: 500 A ..... :	D1 – 21 D2 – 25 D3 – 26	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ..... :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ..... :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ..... :	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.1.2 addition acc. IEC 62423	Verification of the correct operation in case of steady increase of composite residual current		P
	starting composite residual current:	6mA	P
	Different frequency component values of test currents for calibration (RMS) / Composite starting current value (RMS)		P
	$I_{at\ rated\ frequency}$ | I_{1kHz} | $I_{F\ motor\ (10Hz)}$ | I_{Δ}		
	0,138 $I_{\Delta N}$ | 0,138 $I_{\Delta N}$ | 0,035 $I_{\Delta N}$ | 0,2 $I_{\Delta N}$		
	S1, S2 and RCCB in the closed position, residual current steady increase, starting from a value not higher than the starting composite value to attain the upper limit of residual operating current (1,4 $I_{\Delta N}$) within 30 s		P
	- tripping current between 0,5 $I_{\Delta N}$ and 1,4 $I_{\Delta n}$ (mA) :	D1 – 31,8~33,6 D2 – 32,5~34,5 D3 – 32,1~33,1	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.1.3 addition acc. IEC 62423	Verification of the correct operation in case of sudden appearance of composite residual current		--
	composite residual current acc. 9.1.2		P
	S1 and RCCB in the closed position, residual current suddenly established by closing S2		P
	RCCB shall trip with a test current of 7 $I_{\Delta n}$ (ms) :	D1 – 20 D2 – 21 D3 – 22	P
	max. break time:		--
	- general type RCCBs: 40ms		P
	- S type RCCBs: 150ms		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: 7 $I_{\Delta n}$; 0,05 s :	D1 - D2 - D3 -	N/A
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load for ratings of $I_{\Delta n}$ not tested in D_1,test acc. figure 6b		--
a)	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	Test switch S_1 and S_2 and RCCB in closed position		P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) ..... :	D1 – 6~60mA D2 – 6~60mA D3 – 6~60mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ (mA) . :	D1 – 33,1~33,8 D2 – 33,2~33,9 D3 – 33,1~34,2	P
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 – 150 D2 – 152 D3 – 151	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 4 $I_{\Delta n}$ ..... :	D1 – 30 D2 – 28 D3 – 28	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ ..... :	D1 – 21 D2 – 20 D3 – 20	P
	No value exceeds the relevant specified limiting value		P
8.15	**Behaviour of RCCBs in case of earth fault currents comprising a d.c. component**		--
9.9.3	Additional verification of correct operation at residual currents with d.c. components for RCCBs type A		--
9.9.3.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		P
9.9.4	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ..... :	Independent on line voltage for Type A part. Tested at 50/60Hz	P
9.9.3.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~42mA	P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ..... :	D1 – 29,7~31,6mA D2 – 29,5~31,2mA D3 – 29,5~30,6mA	P
	- angle α = 90° (+/-) ..... :	D1 – 25,2~26,2mA D2 – 25,3~26,4mA D3 – 25,4~26,7mA	P
	- angle α = 135° (+/-) ..... :	D1 – 27,2~28,2mA D2 – 26,5~27,7mA D3 – 27,1~28,2mA	P
	No value exceeds the relevant specified limiting values		P
9.9.3.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle α = 0°)		

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs with $I_{\Delta n}$ < 0,03 A:		
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,5 A rms (+/-) ... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) .. :	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ = 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ..... :	D1 – 184 D2 – 164 D3 – 176	P
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ..... :	D1 – 61 D2 – 58 D3 – 56	P
	- maximum break time (ms) at: 0,35 A rms (+/-) . :	D1 – 25 D2 – 27 D3 – 26	P
	- maximum break time (ms) at: 350 A rms (+/-) .. :	D1 – 16 D2 – 20 D3 – 21	P
	RCCBs with $I_{\Delta n}$ > 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) ..... :	D1 - D2 - D3 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 350 A rms (+/-) .. :	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		P
9.9.3.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		
	- test current (A): In ..... :	63	—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~42mA	P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ..... :	D1 – 30,7~31,5mA D2 – 30,6~31,6mA D3 – 30,5~31,6mA	P
	- angle α = 90° (+/-) ..... :	D1 – 25,5~26,3mA D2 – 25,4~26,6mA D3 – 25,2~26,2mA	P
	- angle α = 135° (+/-) ..... :	D1 – 27,5~28,6mA D2 – 27,4~28,4mA D3 – 27,3~28,5mA	P
	No value exceeds the relevant specified limiting values		P
9.9.3.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~42mA	P
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 6 mA) ..... :	D1 – 30,2~32,5mA D2 – 30,8~32,4mA D3 – 29,6~32,5mA	P
	No value exceeds the relevant specified limiting values		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.1.7 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of the correct operation in case of residual pulsating direct currents in presence of a standing smooth direct current of 0,01 A		--
	Test acc. 9.21.1.4 but the smooth direct current of 0,006 A replaced by 0,01 A		N/A
	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,01 A:		--
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 10 mA) ..... :	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.2.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the operating characteristics at the reference temperature (20±5)°C	20,4°C	P

IEC 62423, Table 1 -Type B RCCBs- Standard values of break time and non-actuating time for residual direct currents which result from rectifying circuits and for residual smooth direct current

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to					
				2 $I_{\Delta N}$	4 $I_{\Delta N}$	10 $I_{\Delta N}$	5A,10A,20A,50A,100A,200A a)		--
	General	Any value	Any value	0,3	0,15	0,04	0,04	Max. break times	--
	S	≥ 25	>0,03	0,5	0,2	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	0,04	Min. non-actuating times	--

	a) Tests only made during verification of the correct operation as mentioned in 9.2.1.5 b) acc. figure 6a and 9.2.1.6 b) acc. figure 6b	--
9.2.1.1 addition acc. IEC 62423	General	--
	Each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) :	0,8x230=184V 1,1x240=264V P
	Tests a rated frequency	Both 50Hz and 60Hz P
	For multiple settings of $I_{\Delta n}$ tests are made for each setting	N/A
	RCCB installed as for normal use	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.1.2 addition acc. IEC 62423	Verification of the correct operation in case of residual sinusoidal alternating currents up to 1000 Hz		--
a)	Test switch S_1 and S_2 and RCCB in closed position		--
	Test at 150Hz:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2,4 $I_{\Delta n}$ within 30 s (mA) ..... :	D1 – 6~72mA D2 – 6~72mA D3 – 6~72mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2,4 $I_{\Delta n}$ (mA) :	D1 – 25,4~26,3mA D2 – 25,5~25,6mA D3 – 25,6~25,8mA	P
	Test at 400Hz:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 6 $I_{\Delta n}$ within 30 s (mA) ..... :	D1 – 6~180mA D2 – 6~180mA D3 – 6~180mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 6 $I_{\Delta n}$ (mA) . :	D1 – 41,2~42,1mA D2 – 41,5~41,9mA D3 – 41,5~42,0mA	P
	Test at 1000Hz:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 14 $I_{\Delta n}$ within 30 s (mA) ..... :	D1 – 6~420mA D2 – 6~420mA D3 – 6~420mA	P
	- tripping current between $I_{\Delta n}$ and 14 $I_{\Delta n}$ (mA) ..... :	D1 – 127~137mA D2 – 119~136mA D3 – 125~132mA	P
b)	S1 and RCCB in the closed position, residual current correspond to 1000Hz suddenly established by closing S2		P
	RCCB shall trip with a test current of 14 $I_{\Delta n}$ (ms) :	D1 – 20 D2 – 18 D3 – 19	P
	max. break time:		--
	- general type RCCBs: 0,3s		P
	- S type RCCBs: 0,5s		N/A
	Additional test for type S:		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 14 $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
9.2.1.3 addition acc. IEC 62423	Verification of the correct operation in the case of a residual alternating current superimposed on a residual smooth direct current		--
	Test acc. figure 4		P
	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual smooth direct current applied through one pole chosen at random and adjusted to		--
	- 0,4 $I_{\Delta n}$ or	12mA	P
	- 10 mA		N/A
	whichever is the higher value		P
	Residual alternating current at rated frequency applied to another pole and:	50/60Hz	P
	- steady increase from max. 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ..... :	D1 – 6~30mA D2 – 6~30mA D3 – 6~30mA	P
	- alternating tripping current ≤ $I_{\Delta n}$(mA) ..... :	D1 – 20,0~21,7mA D2 – 20,2~21,8mA D3 – 20,1~22,2mA	P
	Test made twice at each position I and II of S_3		P
9.2.1.4 addition acc. IEC 62423	Verification of the correct operation in the case of a residual pulsating direct current superimposed on a residual smooth direct current		--
	Test acc. figure 5		P
	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual smooth direct current applied through one pole chosen at random and adjusted to		--
	- 0,4 $I_{\Delta n}$ or	12mA	P
	- 10 mA		N/A
	whichever is the higher value		P
	Residual pulsating direct current applied to another pole with a current delay angle of 0° and:		P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 1,4 $I_{\Delta n}$ within 30 s (mA) for RCCBs with $I_{\Delta n}$>0,01 A..... :	D1 – 6~42mA D2 – 6~42mA D3 – 6~42mA	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) for RCCBs with $I_{\Delta n} \leq 0{,}01$ A ..... :	D1 - D2 - D3 -	N/A
	RCCB tested twice at each position I and II of S_3 and S_4		P
	- residual pulsating tripping current ≤ 1,4 $I_{\Delta n}$(mA) for RCCBs with $I_{\Delta n}$>0,01 A..... :	D1 – 23,9~30,4mA D2 – 23,8~30,2mA D3 – 24,1~30,1mA	P
	- residual pulsating tripping current ≤ 2 $I_{\Delta n}$(mA) for RCCBs with $I_{\Delta n} \leq 0{,}01$ A..... :	D1 - D2 - D3 -	N/A
9.2.1.5 addition acc. IEC 62423	Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Test acc. figure 6a		P
a)	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual pulsating direct current:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) ..... :	D1 – 6~60mA D2 – 6~60mA D3 – 6~60mA	P
	-tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ ..... :	D1 – 35,1~33,2mA D2 – 35,2~33,2mA D3 – 35,6~33,2mA	P
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 152 D2 – 152 D3 – 152	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 28 D2 – 27 D3 – 28	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 21 D2 – 20 D3 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.6 addition acc. IEC 62423	Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--
	Test acc. figure 6b		N/A
a)	Test switch S_1 and S_2 and RCCB in closed position		N/A
	Residual pulsating direct current:		N/A
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) ..... :	D1 - D2 - D3 -	N/A
	-tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ ..... :	D1 - D2 - D3 -	N/A
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: _____A (value given in table 1) ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: _____A (value given in table 1) ..... :	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.2.1.7.2 addition acc. IEC 62423	Verification of the correct operation in case of residual smooth direct current with load ,test acc. figure 6b		--
	Verification of the correct operation in case of a steady increase residual smooth direct current:		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- test current (A): In, until steady state conditions are reached ..... :	63	P
	- cross-sectional area (mm²) ..... :	16 mm^2	P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) ..... :	D1 – 6~60mA D2 – 6~60mA D3 – 6~60mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ (mA) . :	D1 – 33,2~33,9mA D2 – 33,5~34,2mA D3 – 33,4~34,0mA	P
9.2.2 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Tests at the temperature limits		--
	tests acc. 9.2.1.5 b), 9.2.1.6 b) and 9.2.1.7.1 b) under the following conditions:		P
	- ambient temperature: -5°C, off load	-5°C	P
	- ambient temperature: +40°C RCCB previously loaded with rated current until steady state conditions are reached	+40°C	P
9.2.1.5 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Tests repeated at a temperature of -5 °C:	-5°C	P
	Test acc. figure 6a		P
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 150 D2 – 151 D3 – 150	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 28 D2 – 28 D3 – 28	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 22 D2 – 21 D3 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.6 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--
	Tests repeated at a temperature of -5 °C:		N/A
	Test acc. figure 6b		N/A
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: _____A (value given in table 1) ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: _____A (value given in table 1) ..... :	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load ,test acc. figure 6b		P
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	Tests repeated at a temperature of -5 °C:	-5 °C	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 – 150 D2 – 149 D3 – 152	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 4 $I_{\Delta n}$ ..... :	D1 – 29 D2 – 28 D3 – 28	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ ..... :	D1 – 18 D2 – 20 D3 – 19	P
	No value exceeds the relevant specified limiting value		P
9.2.1.5 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Tests repeated at a temperature of +40 °C:	+40 °C	P
	- test current (A): In, until steady state conditions are reached ..... :	63	P
	- cross-sectional area (mm²) ..... :	16	P
	Test acc. figure 6a		P
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 149 D2 – 150 D3 – 150	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 27 D2 – 30 D3 – 29	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D1 – 21 D2 – 21 D3 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.6 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Tests repeated at a temperature of +40 °C:		N/A
	- test current (A): In, until steady state conditions are reached ..... :		N/A
	- cross-sectional area (mm²) ..... :		N/A
	Test acc. figure 6b		N/A
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: _____A (value given in table 1) ..... :	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: _____A (value given in table 1) ..... :	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load ,test acc. figure 6b		--
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	Tests repeated at a temperature of +40°C:	+40°C	P
	- test current (A): In, until steady state conditions are reached ..... :	63	P
	- cross-sectional area (mm²) ..... :	16	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D1 – 148 D2 – 149 D3 – 151	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 4 $I_{\Delta n}$ ..... :	D1 – 28 D2 – 28 D3 – 30	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ ..... :	D1 – 20 D2 – 19 D3 – 20	P
	No value exceeds the relevant specified limiting value		P

	Tests "D1"		
8.12	RCCBs functionally dependent on line voltage		--
	RCCBs functionally dependent on the line voltage, shall operate correctly between 0,85 and 1,1 times their rated voltage; voltage (V) .....:		N/A
	Multipole RCCBs shall have all current paths supplied from the phases and neutral, if any		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts .....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A .....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A .....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		N/A
8.14	Behaviour of RCCBs in case of current surges caused by impulse voltages		--
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		--
9.19.1	Current surge test for all RCCBs (0,5µs/100kHz ring wave test)		--
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		--
	- peak value: 200 A + 10/0%	200A	P
	- virtual front time: 0,5 µs ± 30%	0,5 µs	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- period of the following oscillatory wave: 10 μs ± 20%	10 μs	P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
	During the test the RCCB shall not trip .....:	D1 – Not trip D2 – Not trip D3 – Not trip	P
	- break time (ms) at: $I_{\Delta n}$ .....:	D1 – 196 D2 – 193 D3 – 195	P
9.19.2 9.1.5 addition acc. IEC 62423	Verification of behaviour at surge currents up to 3000A (8/20μs surge current)		--
9.19.2.1	Test conditions		--
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		--
	Peak value: 3000A +10/-0%	3000A	P
	Virtual front time: 0,8μs ± 20%	0,8 μs	P
	Virtual time of half value: 20μs ± 20%	20μs	P
	Peak of reverse current: less than 30 % of peak value		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
9.19.2.2	During the test the RCCB shall not trip	D1 – D2 – D3 –	N/A
	- break time (ms) at $I_{\Delta n}$ .....:	D1 – D2 – D3 –	N/A

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Clause	Requirement + Test				Result - Remark	Verdict
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed				D1 – not trip D2 – not trip D3 – not trip	P
	- break time (ms) at $I_{\Delta n}$ .....:				D1 – 195 D2 – 191 D3 – 193	P
9.1.6 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of behaviour in the case of inrush residual currents					--
	Test acc. figure 2					N/A
	all switches and RCCB in closed position					N/A
	pulse with a peak current of 10 $I_{\Delta n}$ ..... (mA):					N/A
	Pulse on one pole chosen at random					N/A
	Six measurements: 3 times positive, 3 times negative					N/A
	Polarity changed after each test					N/A
	No tripping during test					N/A
9.1.4 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of the correct operation for four-pole Type F RCCDs powered on two poles only					--
	Tests performed with a four-pole RCCB acc. 9.1.2, but only supplied between neutral terminal and one-phase terminal chosen at random without load					N/A
9.1.2 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of the correct operation in case of steady increase of composite residual current					--
	starting composite residual current:					N/A
	Different frequency component values of test currents for calibration (RMS)			Composite starting current value (RMS)		N/A
	$I_{at\ rated\ frequency}$	I_{1kHz}	$I_{F\ motor\ (10Hz)}$	I_{Δ}		N/A
	0,138 $I_{\Delta N}$	0,138 $I_{\Delta N}$	0,035 $I_{\Delta N}$	0,2 $I_{\Delta N}$		N/A
	S1, S2 and RCCB in the closed position, residual current steady increase, starting from a value not higher than the starting composite value to attain the upper limit of residual operating current (1,4 $I_{\Delta N}$) within 30 s					N/A
	- tripping current between 0,5 $I_{\Delta N}$ and 1,4 $I_{\Delta n}$ (mA) .....:				D1 - D2 - D3 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.3 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Correct operation for RCCBs powered on two poles		--
	tests acc. 9.2.1.2 and 9.2.1.7.1		N/A
	RCCB only supplied between neutral terminal and one-phase terminal chosen at random for four-pole devices or		N/A
	RCCB only supplied between 2-phase terminals chosen at random for 3-pole devices		N/A
	Tests at rated frequency and without load		N/A
9.2.1.2 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual sinusoidal alternating currents up to 1000 Hz		--
a)	Test switch S_1 and S_2 and RCCB in closed position		N/A
	Test at 150Hz:		N/A
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2,4 $I_{\Delta n}$ within 30 s (mA) .....:	D1 - D2 - D3 -	N/A
	- tripping current between 0,5 $I_{\Delta n}$ and 2,4 $I_{\Delta n}$ (mA) :	D1 - D2 - D3 -	N/A
	Test at 400Hz:		N/A
	- steady increase from max. 0,2 $I_{\Delta n}$ to 6 $I_{\Delta n}$ within 30 s (mA) .....:	D1 - D2 - D3 -	N/A
	- tripping current between 0,5 $I_{\Delta n}$ and 6 $I_{\Delta n}$ (mA) ..:	D1 - D2 - D3 -	N/A
	Test at 1000Hz:		N/A
	- steady increase from max. 0,2 $I_{\Delta n}$ to 14 $I_{\Delta n}$ within 30 s (mA) .....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta n}$ and 14 $I_{\Delta n}$ (mA) .....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
b)	S1 and RCCB in the closed position, residual current correspond to 1000Hz suddenly established by closing S2		N/A
	RCCB shall trip with a test current of 14 $I_{\Delta n}$ (ms) :	D1 - D2 - D3 -	N/A
	max. break time:		N/A
	- general type RCCBs: 0,3s		N/A
	- S type RCCBs: 0,5s		N/A
	Additional test for type S:		N/A
	- minimum non actuating time (ms) at: 14 $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load for ratings of $I_{\Delta n}$, test acc. figure 6b		
a)	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	Test switch S_1 and S_2 and RCCB in closed position		N/A
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) .....:	D1 - D2 - D3 -	N/A
	- tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ (mA) ..:	D1 - D2 - D3 -	N/A
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 10 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$ .....:	1000A	--
	Test circuit according to figure .....:	Figure 7	--
	Point of test circuit which is directly earthed .....:	Supply side	--
	Grid distance "a" (mm) .....:	35	--
	Prospective current (A) .....:	1000	--
	Prospective current obtained (A) .....:	255V / 1,05x10^3	--
	Power factor .....:	0,93~0,98	--
	Power factor obtained .....:	0,97	--
	Point of initiation: 45° ± 5°	45°	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	O-CO-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	D1 – 2,45 D2 – 3,14 D3 – 3,28	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		--
	a) .....:	D1 – OK D2 – OK D3 – OK	P
	b) .....:	D1 – OK D2 – OK D3 – OK	P
	c) .....:	D1 – OK D2 – OK D3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) .....:	D1 - D2 - D3 -	N/A
	e) .....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown .....:	D1 – OK D2 – OK D3 – OK	P
	Making and breaking In at Un .....:	D1 – OK D2 – OK D3 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	D1 – 194 D2 – 185 D3 – 191	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts .....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A .....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A .....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
8.11	Test device		--
	RCCBs shall be provided with a test device		P
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$	Ampere-turns: 46,8mA-turns 2,5 times the ampere-turns: 75,0 mA-turns	P
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.16	Verification of the operation of the test device at the limits of rated voltage:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	a) RCCB at 0,85 times the rated voltage, test device actuated 25 times at intervals of 5 s .....:	D1 – 195V D2 – 195V D3 – 195V	P
	b) test a) repeated at 1,1 times the rated voltage :	D1 – 264V D2 – 264V D3 – 264V	P
	c) test b) repeated, but only once, the operating means of the test device being held in the closed position for 30 s .....:	D1 – OK D2 – OK D3 – OK	P
	RCCB operated at each test .....:	D1 – Operated D2 – Operated D3 – Operated	P
	No change impairing further use .....:	D1 – OK D2 – OK D3 – OK	P
8.8	Resistance to mechanical shock and impact		--
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		--
	Mechanical shock: 50 falls of 40 mm on one side; 50 falls on opposite side C turned through 90°; 50 falls on one side; 50 falls on opposite side		P
	No opening of RCCB during the test .....:	D1 – OK D2 – OK D3 – OK	P
9.12.2	Mechanical impact		--
9.12.2.1	Impact test (10 blows, height 10 cm): no damage :	D1 – no damage D2 – no damage D3 – no damage	P
9.12.2.2	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min		P
	RCCB shall not become loose during test and no damage impairing its further use .....:	D1 – OK D2 – OK D3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.12.2.3	RCCBs of plug-in type (under consideration)		--
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		--
	RCCBs shall not operate under specified conditions of overcurrent		P
9.18.1	Verification of the limiting value of overcurrent in case of a load through a RCCB with two poles		--
	RCCB connected as for normal use with a load equal to (A): 6 In switched on using a two-pole test switch for 1 s .....:	246V, 382A, 1,02s	P
	Test repeated three times with an interval of at least 1 min .....:	D1 – 382A, 1,02s D2 – 382A, 1,02s D3 – 382A, 1,02s	P
	The RCCB shall not open .....:	D1 – Not trip D2 – Not trip D3 – Not trip	P
	RCCBs functionally dependent on the line voltage at rated voltage (Un) .....:		N/A
9.18.2	Verification of the limiting value of overcurrent in case of a single phase load through a three-pole or four-pole RCCB		--
	RCCB connected according to fig. 22		N/A
	Test current (A): 6 In closed by S1 for 1 s .....:		--
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min .....:	D1 - D2 - D3 -	N/A
	The RCCB shall not open .....:	D1 - D2 - D3 -	N/A
	RCCBs functionally dependent on the line voltage at rated voltage		N/A
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	D1 – 96 D2 – 98 D3 – 92	P

	TEST SEQUENCE D 2 samples: 230V/240V, 63A, 30mA, 1P+N 400V415V, 63A, 30mA, 3P+N	**D_0-1** **D_0-2**	
	Tests "D0"		

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Clause	Requirement + Test	Result - Remark	Verdict
8.5	Operating characteristics		--
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) .....:	Independent of line voltage for Type A part. Tested at both 50Hz and 60Hz Dependent on line voltage for Type B part. Tested at 0,8x230=184V 1,1x230=253V Tested at both 50Hz and 60Hz	P

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							--
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A[a)]	5A-200A[b)]	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--
	a) value to be decided by the manufacturer for this test										--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4										--

9.9.2	Off-load tests made at a temperature of 20 ± 2 °C		P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		--
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	D_0-1 – 20~100mA D_0-2 – 60~300mA	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	D_0-1 – 74,8~76,3 D_0-2 – 205~212	P
9.9.2.2	Verification of the correct operation at closing on residual current		--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	D_0-1 – 95 D_0-2 – 50	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D_0-1 - 96 D_0-2 - 48	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 - 74 D_0-2 - 27	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D_0-1 - 26 D_0-2 - 25	P
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 500 A .....:	D_0-1 - 20 D_0-2 - 17	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A (among the following list: 5A, 10A, 20A, 50A, 100A, 200A):		--
	The test switch S_1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S_2		--
	- maximum break time (ms) at: 5A (value 1 between 5A and 200A) .....:	D_0-1 - 17 D_0-2 - 16	P
	- maximum break time (ms) at:10A (value 2 between 5A and 200A) .....:	D_0-1 - 18 D_0-2 - 13	P
	- maximum break time (ms) at:20A (value 3 between 5A and 200A) .....:	D_0-1 - 15 D_0-2 - 13	P
	- maximum break time (ms) at:50A (value 4 between 5A and 200A) .....:	D_0-1 - 16 D_0-2 - 15	P
	- maximum break time (ms) at:100A (value 5 between 5A and 200A) .....:	D_0-1 - 20 D_0-2 - 15	P
	- maximum break time (ms) at:200A (value 6 between 5A and 200A) .....:	D_0-1 - 17 D_0-2 - 12	P
	- maximum break time (ms) at:500A.....:	D_0-1 - 14 D_0-2 - 15	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D_0-1 - D_0-2 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D_0-1 - D_0-2 -	N/A
	No tripping during tests		N/A
9.9.2.6	a) Tests repeated at a temperature of -5 °C:		--
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D_0-1 - 95 D_0-2 - 45	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 - 35 D_0-2 - 28	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D_0-1 - 30 D_0-2 - 25	P
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 500 A .....:	D_0-1 - 25 D_0-2 - 18	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D_0-1 - D_0-2 -	N/A
	No tripping during the tests		N/A
9.9.2.5	Tests repeated with the RCCB loaded with rated current:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- test current (A): In, the pole under test and one other pole loaded with rated current, the current being established shortly before the test .....:	63A	--
	- cross-sectional area (mm²) .....:	16	--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	D_0-1 - 94 D_0-2 - 46	P
	The switch S_1 and the RCCB are in closed position. The residual current is established by closing S_2 :		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D_0-1 - 95 D_0-2 - 45	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 - 32 D_0-2 - 26	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D_0-1 - 17 D_0-2 - 21	P
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 500 A .....:	D_0-1 - 15 D_0-2 - 16	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D_0-1 - D_0-2 -	N/A
	No tripping during the tests		N/A
9.9.2.6	b) Tests repeated with the RCCB loaded with rated current:		--
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached .....:	63	--
	- cross-sectional area (mm²) .....:	16	--

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Clause	Requirement + Test	Result - Remark	Verdict
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D_0-1 - 92 D_0-2 - 45	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 - 35 D_0-2 - 28	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D_0-1 - 27 D_0-2 - 25	P
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 500 A .....:	D_0-1 - 17 D_0-2 - 19	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s .....:	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D_0-1 - D_0-2 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D_0-1 - D_0-2 -	N/A
	No tripping during the tests		N/A
9.1.2 addition acc. IEC 62423	Verification of the correct operation in case of steady increase of composite residual current		P
	starting composite residual current:	6mA	P
	Different frequency component values of test currents for calibration (RMS) / Composite starting current value (RMS)		P
	$I_{at\ rated\ frequency}$ / I_{1kHz} / $I_{F\ motor\ (10Hz)}$ / I_{Δ}		
	0,138 $I_{\Delta N}$ / 0,138 $I_{\Delta N}$ / 0,035 $I_{\Delta N}$ / 0,2 $I_{\Delta N}$		
	S1, S2 and RCCB in the closed position, residual current steady increase, starting from a value not higher than the starting composite value to attain the upper limit of residual operating current (1,4 $I_{\Delta N}$) within 30 s		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between 0,5 $I_{\Delta N}$ and 1,4 $I_{\Delta n}$ (mA) :	D_0-1 – 113~120 D_0-2 – 325~332	P
9.1.3 addition acc. IEC 62423	Verification of the correct operation in case of sudden appearance of composite residual current		--
	composite residual current acc. 9.1.2		P
	S1 and RCCB in the closed position, residual current suddenly established by closing S2		P
	RCCB shall trip with a test current of 7 $I_{\Delta n}$ (ms) :	D_0-1 - 25 D_0-2 - 26	P
	max. break time:		--
	- general type RCCBs: 40ms		P
	- S type RCCBs: 150ms		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: 7 $I_{\Delta n}$; 0,05 s :	D_0-1 - D_0-2 -	N/A
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load for ratings of $I_{\Delta n}$ not tested in D_1,test acc. figure 6b		--
a)	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	Test switch S_1 and S_2 and RCCB in closed position		P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) .....:	D_0-1 – 20~200mA D_0-2 – 60~600mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ (mA) ..:	D_0-1 – 112~120 D_0-2 – 319~334	P
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 – 125~131 D_0-2 – 142~148	P
	- maximum break time (ms) at: 4 $I_{\Delta n}$ .....:	D_0-1 – 15~20 D_0-2 – 15~20	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ .....:	D_0-1 – 12~17 D_0-2 – 14~18	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		P
8.15	**Behaviour of RCCBs in case of earth fault currents comprising a d.c. component**		--
9.9.3	Additional verification of correct operation at residual currents with d.c. components for RCCBs type A		--
9.9.3.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		P
9.9.4	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) .....:	Independent of line voltage for Type A part. Tested at 50/60Hz	P
9.9.3.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~140mA 0~420mA	P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) .....:	D_0-1 – 91,2~92,8 D_0-2 – 241~254	P
	- angle α = 90° (+/-) .....:	D_0-1 – 80,5~81,5 D_0-2 – 237~250	P
	- angle α = 135° (+/-) .....:	D_0-1 – 81,2~82,1 D_0-2 – 287~304	P
	No value exceeds the relevant specified limiting values		P
9.9.3.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle α = 0°)		
	RCCBs with $I_{\Delta n}$ < 0,03 A:		
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) .....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) .....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 0,5 A rms (+/-) ....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D_0-1 - D_0-2 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs with $I_{\Delta n}$ = 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) .....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) .....:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 0,35 A rms (+/-) ..:	D_0-1 - D_0-2 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D_0-1 - D_0-2 -	N/A
	RCCBs with $I_{\Delta n}$ > 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) .....:	D_0-1 - 81 D_0-2 – 45	P
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) .....:	D_0-1 - 31 D_0-2 - 26	P
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) .....:	D_0-1 - 25 D_0-2 - 20	P
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D_0-1 - 21 D_0-2 - 16	P
	No value exceeds the relevant specified limiting value		P
9.9.3.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		
	- test current (A): In .....:	63	—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~140mA 0~420mA	P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) .....:	D_0-1 – 91,2~92,8 D_0-2 – 241~254	P
	- angle α = 90° (+/-) .....:	D_0-1 – 80,4~81,7 D_0-2 – 234~250	P
	- angle α = 135° (+/-) .....:	D_0-1 – 81,3~82,4 D_0-2 – 291~311	P
	No value exceeds the relevant specified limiting values		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.3.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~140mA 0~420mA	P
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 6 mA) .....:	D_0-1 – 92,4~95,2mA D_0-2 – 245~256mA	P
	No value exceeds the relevant specified limiting values		P
9.1.7 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of the correct operation in case of residual pulsating direct currents in presence of a standing smooth direct current of 0,01 A		--
	Test acc. 9.21.1.4 but the smooth direct current of 0,006 A replaced by 0,01 A		N/A
	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,01 A:		--
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 10 mA) .....:	D_0-1 – D_0-2 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.2.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the operating characteristics at the reference temperature (20±5)°C	20,2°C	P

IEC 62423, Table 1 -Type B RCCBs- Standard values of break time and non-actuating time for residual direct currents which result from rectifying circuits and for residual smooth direct current

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to					--
				2 $I_{\Delta N}$	4 $I_{\Delta N}$	10 $I_{\Delta N}$	5A,10A,20A,50A,100A,200A a)		--
	General	Any value	Any value	0,3	0,15	0,04	0,04	Max. break times	--
	S	≥ 25	>0,03	0,5	0,2	0,15	0,15	Max. break times	--

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Clause	Requirement + Test						Result - Remark		Verdict
				0,13	0,06	0,05	0,04	Min. non-actuating times	--
	a) Tests only made during verification of the correct operation as mentioned in 9.2.1.5 b) acc. figure 6a and 9.2.1.6 b) acc. figure 6b								--
9.2.1.1 addition acc. IEC 62423	General								--
	Each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) :						0,8x230=184V 1,1x240=264V		P
	Tests a rated frequency						Both 50Hz and 60Hz		P
	For multiple settings of $I_{\Delta n}$ tests are made for each setting								N/A
	RCCB installed as for normal use								P
9.2.1.2 addition acc. IEC 62423	Verification of the correct operation in case of residual sinusoidal alternating currents up to 1000 Hz								--
a)	Test switch S_1 and S_2 and RCCB in closed position								--
	Test at 150Hz:								--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2,4 $I_{\Delta n}$ within 30 s (mA) .....:						D_0-1 – 20~240mA D_0-2 – 60~720mA		P
	- tripping current between 0,5 $I_{\Delta n}$ and 2,4 $I_{\Delta n}$ (mA) :						D_0-1 – 87,2~88,5 D_0-2 – 251~259		P
	Test at 400Hz:								--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 6 $I_{\Delta n}$ within 30 s (mA) .....:						D_0-1 – 143~147 D_0-2 – 426~437		P
	- tripping current between 0,5 $I_{\Delta n}$ and 6 $I_{\Delta n}$ (mA) ..:						D_0-1 – 276~285 D_0-2 – 549~568		P
	Test at 1000Hz:								--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 14 $I_{\Delta n}$ within 30 s (mA) .....:						D_0-1 – 20~240mA D_0-2 – 60~720mA		P
	- tripping current between $I_{\Delta n}$ and 14 $I_{\Delta n}$ (mA) .....:						D_0-1 – 15~18 D_0-2 – 17~19		P
b)	S1 and RCCB in the closed position, residual current correspond to 1000Hz suddenly established by closing S2								P
	RCCB shall trip with a test current of 14 $I_{\Delta n}$ (ms) :						D_0-1 – D_0-2 –		P
	max. break time:								--
	- general type RCCBs: 0,3s								P
	- S type RCCBs: 0,5s								N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		--
	- minimum non actuating time (ms) at: 14 $I_{\Delta n}$; 0,13 s :	D_0-1 – D_0-2 –	N/A
9.2.1.3 addition acc. IEC 62423	Verification of the correct operation in the case of a residual alternating current superimposed on a residual smooth direct current		--
	Test acc. figure 4		P
	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual smooth direct current applied through one pole chosen at random and adjusted to		--
	- 0,4 $I_{\Delta n}$ or	40/120mA	P
	- 10 mA		N/A
	whichever is the higher value		P
	Residual alternating current at rated frequency applied to another pole and:	50/60Hz	P
	- steady increase from max. 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	D_0-1 – 20~100 D_0-2 – 60~300	P
	- alternating tripping current ≤ $I_{\Delta n}$(mA) .....:	D_0-1 – 68,5~71,5 D_0-2 – 203~212	P
	Test made twice at each position I and II of S_3		P
9.2.1.4 addition acc. IEC 62423	Verification of the correct operation in the case of a residual pulsating direct current superimposed on a residual smooth direct current		--
	Test acc. figure 5		P
	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual smooth direct current applied through one pole chosen at random and adjusted to		--
	- 0,4 $I_{\Delta n}$ or	40/120mA	P
	- 10 mA		N/A
	whichever is the higher value		P
	Residual pulsating direct current applied to another pole with a current delay angle of 0° and:		P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 1,4 $I_{\Delta n}$ within 30 s (mA) for RCCBs with $I_{\Delta n}$>0,01 A.....:	D_0-1 – 20-140mA D_0-2 – 60~420mA	P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) for RCCBs with $I_{\Delta n}$≤0,01 A.....:	D_0-1 – D_0-2 –	N/A
	RCCB tested twice at each position I and II of S_3 and S_4		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- residual pulsating tripping current ≤ 1,4 $I_{\Delta n}$(mA) for RCCBs with $I_{\Delta n}$>0,01 A .....:	D_0-1 – 82,8~108 D_0-2 – 252~306	P
	- residual pulsating tripping current ≤ 2 $I_{\Delta n}$(mA) for RCCBs with $I_{\Delta n}$≤0,01 A.....:	D_0-1 – D_0-2 –	N/A
9.2.1.5 addition acc. IEC 62423	Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Test acc. figure 6a		P
a)	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual pulsating direct current:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA).....:	D_0-1 – 20~200 D_0-2 – 60~600	P
	-tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$.....:	D_0-1 – 110~120 D_0-2 – 335~346	P
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 131 D_0-2 – 36	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 28 D_0-2 – 25	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 20 D_0-2 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.6 addition acc. IEC 62423	Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--
	Test acc. figure 6b		N/A
a)	Test switch S_1 and S_2 and RCCB in closed position		N/A
	Residual pulsating direct current:		N/A
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA).....:	D_0-1 – D_0-2 –	N/A
	-tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$.....:	D_0-1 – D_0-2 –	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 – D_0-2 –	N/A
	- maximum break time (ms) at: _____A (value given in table 1) .....:	D_0-1 – D_0-2 –	N/A
	- maximum break time (ms) at: _____A (value given in table 1) .....:	D_0-1 – D_0-2 –	N/A
	No value exceeds the relevant specified limiting value		N/A
9.2.1.7.2 addition acc. IEC 62423	Verification of the correct operation in case of residual smooth direct current with load ,test acc. figure 6b		--
	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	- test current (A): In, until steady state conditions are reached .....:	63	P
	- cross-sectional area (mm²) .....:	16 mm^2	P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) .....:	D_0-1 – 20~200 D_0-2 – 60~600	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ (mA) ..:	D_0-1 – 115~121 D_0-2 – 320~331	P
9.2.2 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Tests at the temperature limits		--
	tests acc. 9.2.1.5 b), 9.2.1.6 b) and 9.2.1.7.1 b) under the following conditions:		P
	- ambient temperature: -5°C, off load	-5°C	P
	- ambient temperature: +40°C RCCB previously loaded with rated current until steady state conditions are reached	+40°C	P
9.2.1.5 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Tests repeated at a temperature of -5 °C:	-5°C	P
	Test acc. figure 6a		P

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Clause	Requirement + Test	Result - Remark	Verdict
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 128 D_0-2 – 34	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 24 D_0-2 – 22	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 19 D_0-2 – 18	P
	No value exceeds the relevant specified limiting value		P
9.2.1.6 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--
	Tests repeated at a temperature of -5 °C:		N/A
	Test acc. figure 6b		N/A
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 – D_0-2 –	N/A
	- maximum break time (ms) at: _____A (value given in table 1) .....:	D_0-1 – D_0-2 –	N/A
	- maximum break time (ms) at: _____A (value given in table 1) .....:	D_0-1 – D_0-2 –	N/A
	No value exceeds the relevant specified limiting value		N/A
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load ,test acc. figure 6b		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	Tests repeated at a temperature of -5 °C:	-5 °C	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 – 129 D_0-2 – 148	P
	- maximum break time (ms) at: 4 $I_{\Delta n}$ .....:	D_0-1 – 22 D_0-2 – 21	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ .....:	D_0-1 – 18 D_0-2 – 20	P
	No value exceeds the relevant specified limiting value		P
9.2.1.5 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Tests repeated at a temperature of +40 °C:	+40 °C	P
	- test current (A): In, until steady state conditions are reached .....:	63	P
	- cross-sectional area (mm²) .....:	16	P
	Test acc. figure 6a		P
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 134 D_0-2 – 36	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 25 D_0-2 – 21	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) .....:	D_0-1 – 18 D_0-2 – 20	P
	No value exceeds the relevant specified limiting value		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.1.6 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--
	Tests repeated at a temperature of +40 °C:		N/A
	- test current (A): In, until steady state conditions are reached .....:		N/A
	- cross-sectional area (mm²) .....:		N/A
	Test acc. figure 6b		N/A
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 – D_0-2 –	N/A
	- maximum break time (ms) at: _____A (value given in table 1) .....:	D_0-1 – D_0-2 –	N/A
	- maximum break time (ms) at: _____A (value given in table 1) .....:	D_0-1 – D_0-2 –	N/A
	No value exceeds the relevant specified limiting value		N/A
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load ,test acc. figure 6b		--
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	Tests repeated at a temperature of +40°C:	+40°C	P
	- test current (A): In, until steady state conditions are reached .....:	63	P
	- cross-sectional area (mm²) .....:	16	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D_0-1 – 129 D_0-2 – 149	P
	- maximum break time (ms) at: 4 $I_{\Delta n}$ .....:	D_0-1 – 20 D_0-2 – 21	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 10 $I_{\Delta n}$ .....:	D_0-1 – 18 D_0-2 – 19	P
	No value exceeds the relevant specified limiting value		P

	TEST SEQUENCE D 3 samples: 400V415V, 63A, 30mA, 3P+N	**D-4**	**D-5**	**D-6**	
	Tests "D0"				
8.5	Operating characteristics				--
	For multiple settings of $I_{\Delta n}$ tests are made for each setting				N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4				P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ..... :	Independent of line voltage for Type A part. Tested at both 50Hz and 60Hz Dependent on line voltage for Type B part. Tested at 0,8x400=320V 1,1x415=457V Tested at both 50Hz and 60Hz			P

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A[a)]	5A-200A[b)]	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--
	a) value to be decided by the manufacturer for this test										--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4										--

9.9.2	Off-load tests made at a temperature of 20 ± 2 °C		P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		--
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~30mA D5 – 6~30mA D6 – 6~30mA	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ..... :	D4 – 24,7~25,9 D5 – 24,7~25,8 D6 – 24,7~25,8	P
9.9.2.2	Verification of the correct operation at closing on residual current		--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ..... :	D4 – 118 D5 – 116 D6 – 118	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ ..... :	D4 – 114 D5 – 116 D6 – 115	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D4 – 51 D5 – 51 D6 – 49	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ..... :	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ..... :	D4 – 25 D5 – 26 D6 – 25	P
	- maximum break time (ms) at: 500 A ..... :	D4 – 18 D5 – 17 D6 – 16	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A (among the following list: 5A, 10A, 20A, 50A, 100A, 200A):		--
	The test switch S_1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S_2		--
	- maximum break time (ms) at: 5A (value 1 between 5A and 200A) ..... :	D4 – 16 D5 – 14 D6 – 15	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at:10A (value 2 between 5A and 200A) ..... :	D4 – 15 D5 – 21 D6 – 12	P
	- maximum break time (ms) at:20A (value 3 between 5A and 200A) ..... :	D4 – 10 D5 – 15 D6 – 11	P
	- maximum break time (ms) at:50A (value 4 between 5A and 200A) ..... :	D4 – 12 D5 – 12 D6 – 14	P
	- maximum break time (ms) at:100A (value 5 between 5A and 200A) ..... :	D4 – 13 D5 – 13 D6 – 15	P
	- maximum break time (ms) at:200A (value 6 between 5A and 200A) ..... :	D4 – 16 D5 – 13 D6 – 15	P
	- maximum break time (ms) at:500A (value 6 between 5A and 200A) ..... :	D4 – 16 D5 – 15 D6 – 18	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ..... :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ..... :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ..... :	D4 - D5 - D6 -	N/A
	No tripping during tests		N/A
9.9.2.6	a) Tests repeated at a temperature of -5 °C:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ ..... :	D4 – 120 D5 – 122 D6 – 116	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D4 – 52 D5 – 51 D6 – 50	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ..... :	D4 – 27 D5 – 27 D6 – 27	P
	- maximum break time (ms) at: 0,25 A (if applicable) ..... :	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 500 A ..... :	D4 – 17 D5 – 19 D6 – 18	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ..... :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ..... :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ..... :	D4 - D5 - D6 -	N/A
	No tripping during the tests		N/A
9.9.2.5	Tests repeated with the RCCB loaded with rated current:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- test current (A): In, the pole under test and one other pole loaded with rated current, the current being established shortly before the test ..... :	63A	--
	- cross-sectional area (mm²) ..... :	16	--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ..... :	D4 – 115 D5 – 116 D6 – 119	P
	The switch S_1 and the RCCB are in closed position. The residual current is established by closing S_2 :		--
	- maximum break time (ms) at: $I_{\Delta n}$ ..... :	D4 - 114 D5 - 115 D6 - 117	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D4 - 52 D5 - 51 D6 - 46	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ..... :	D4 - 25 D5 - 25 D6 - 25	P
	- maximum break time (ms) at: 0,25 A (if applicable) ..... :	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 500 A ..... :	D4 - 18 D5 - 17 D6 - 17	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ..... :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ..... :	D4 - D5 - D6 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ..... :	D4 - D5 - D6 -	N/A
	No tripping during the tests		N/A
9.9.2.6	b) Tests repeated with the RCCB loaded with rated current:		--
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ..... :	63	--
	- cross-sectional area (mm²) ..... :	16	--
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ ..... :	D4 – 115 D5 – 118 D6 – 115	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D4 - 52 D5 - 50 D6 - 51	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ..... :	D4 - 27 D5 - 28 D6 - 25	P
	- maximum break time (ms) at: 0,25 A (if applicable) ..... :	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 500 A ..... :	D4 - 21 D5 - 21 D6 - 18	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ..... :	D4 - D5 - D6 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ..... :	D4 - D5 - D6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ..... :	D4 - D5 - D6 -	N/A
	No tripping during the tests		N/A
9.1.2 addition acc. IEC 62423	Verification of the correct operation in case of steady increase of composite residual current		P
	starting composite residual current:	6mA	P

	Different frequency component values of test currents for calibration (RMS)			Composite starting current value (RMS)		P
	$I_{at\ rated\ frequency}$	I_{1kHz}	$I_{F\ motor\ (10Hz)}$	I_{Δ}		
	0,138 $I_{\Delta N}$	0,138 $I_{\Delta N}$	0,035 $I_{\Delta N}$	0,2 $I_{\Delta N}$		

	S1, S2 and RCCB in the closed position, residual current steady increase, starting from a value not higher than the starting composite value to attain the upper limit of residual operating current (1,4 $I_{\Delta N}$) within 30 s		P
	- tripping current between 0,5 $I_{\Delta N}$ and 1,4 $I_{\Delta n}$ (mA) :	D4 – 31,9~33,5mA D5 – 32,2~33,2mA D6 – 32,2~32,9mA	P
9.1.3 addition acc. IEC 62423	Verification of the correct operation in case of sudden appearance of composite residual current		--
	composite residual current acc. 9.1.2		P
	S1 and RCCB in the closed position, residual current suddenly established by closing S2		P
	RCCB shall trip with a test current of 7 $I_{\Delta n}$ (ms) :	D4 – 21 D5 – 20 D6 – 20	P
	max. break time:		--
	- general type RCCBs: 40ms		P
	- S type RCCBs: 150ms		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: 7 $I_{\Delta n}$; 0,05 s :	D4 - D5 - D6 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load for ratings of $I_{\Delta n}$ not tested in D_1,test acc. figure 6b		--
a)	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	Test switch S_1 and S_2 and RCCB in closed position		P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~60mA D5 – 6~60mA D6 – 6~60mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ (mA) . :	D4 – 32,4~33,4mA D5 – 32,5~33,4mA D6 – 32,4~33,5mA	P
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D4 – 150 D5 – 150 D6 – 150	P
	- maximum break time (ms) at: 4 $I_{\Delta n}$ ..... :	D4 – 31 D5 – 28 D6 – 28	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ ..... :	D4 – 20 D5 – 20 D6 – 19	P
	No value exceeds the relevant specified limiting value		P
8.15	**Behaviour of RCCBs in case of earth fault currents comprising a d.c. component**		--
9.9.3	Additional verification of correct operation at residual currents with d.c. components for RCCBs type A		--
9.9.3.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		P
9.9.4	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) .....:	Independent on line voltage for Type A part. Tested at 50/60Hz	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.3.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~42mA	P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) .....:	D4 – 22,4~23,8mA D5 – 22,4~24,4mA D6 – 22,5~23,6mA	P
	- angle α = 90° (+/-) .....:	D4 – 18,8~19,8mA D5 – 18,5~20,4mA D6 – 18,4~20,1mA	P
	- angle α = 135° (+/-) .....:	D4 – 20,4~21,4mA D5 – 20,3~21,5mA D6 – 20,5~21,5mA	P
	No value exceeds the relevant specified limiting values		P
9.9.3.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle α = 0°)		
	RCCBs with $I_{\Delta n}$ < 0,03 A:		
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) .....:	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) .....:	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 0,5 A rms (+/-) ....:	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D4 - D5 - D6 -	N/A
	RCCBs with $I_{\Delta n}$ = 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) .....:	D4 – 95 D5 – 95 D6 – 86	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) .....:	D4 – 43 D5 – 42 D6 – 41	P
	- maximum break time (ms) at: 0,35 A rms (+/-) ..:	D4 – 23 D5 – 25 D6 – 24	P
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D4 – 21 D5 – 17 D6 – 18	P
	RCCBs with $I_{\Delta n}$ > 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) .....:	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) .....:	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) .....:	D4 - D5 - D6 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D4 - D5 - D6 -	N/A
	No value exceeds the relevant specified limiting value		P
9.9.3.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		
	- test current (A): In .....:	63	—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~42mA	P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) .....:	D4 – 22,9~24,0mA D5 – 23,2~24,6mA D6 – 23,5~24,6mA	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- angle α = 90° (+/-) .....:	D4 – 18,7~19,5mA D5 – 18,4~19,6mA D6 – 18,5~19,7mA	P
	- angle α = 135° (+/-) .....:	D4 – 20,5~21,5mA D5 – 20,5~21,3mA D6 – 20,6~21,5mA	P
	No value exceeds the relevant specified limiting values		P
9.9.3.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	0~42mA	P
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 6 mA) .....:	D4 – 23,4~24,4mA D5 – 23,9~24,5mA D6 – 23,7~24,5mA	P
	No value exceeds the relevant specified limiting values		P
9.1.7 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of the correct operation in case of residual pulsating direct currents in presence of a standing smooth direct current of 0,01 A		--
	Test acc. 9.21.1.4 but the smooth direct current of 0,006 A replaced by 0,01 A		N/A
	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,01 A:		--
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 10 mA) ..... :	D4 – D5 – D6 –	N/A
	No value exceeds the relevant specified limiting values		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the operating characteristics at the reference temperature (20±5)°C	20,5°C	P

IEC 62423, Table 1 -Type B RCCBs- Standard values of break time and non-actuating time for residual direct currents which result from rectifying circuits and for residual smooth direct current

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to					
				2 $I_{\Delta N}$	4 $I_{\Delta N}$	10 $I_{\Delta N}$	5A,10A,20A,50A,100A,200A a)		--
	General	Any value	Any value	0,3	0,15	0,04	0,04	Max. break times	--
	S	≥ 25	>0,03	0,5	0,2	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	0,04	Min. non-actuating times	--

	a) Tests only made during verification of the correct operation as mentioned in 9.2.1.5 b) acc. figure 6a and 9.2.1.6 b) acc. figure 6b		--
9.2.1.1 addition acc. IEC 62423	General		--
	Each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) :	0,8x400=320V 1,1x415=457V	P
	Tests a rated frequency	Both 50Hz and 60Hz	P
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
	RCCB installed as for normal use		P
9.2.1.2 addition acc. IEC 62423	Verification of the correct operation in case of residual sinusoidal alternating currents up to 1000 Hz		--
a)	Test switch S_1 and S_2 and RCCB in closed position		--
	Test at 150Hz:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2,4 $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~72mA D5 – 6~72mA D6 – 6~72mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2,4 $I_{\Delta n}$ (mA) :	D4 – 25,2~25,5mA D5 – 25,2~25,5mA D6 – 25,3~25,7mA	P
	Test at 400Hz:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 6 $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~180mA D5 – 6~180mA D6 – 6~180mA	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between 0,5 $I_{\Delta n}$ and 6 $I_{\Delta n}$ (mA) . :	D4 – 40,9~41,2mA D5 – 40,8~41,2mA D6 – 40,9~41,5mA	P
	Test at 1000Hz:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 14 $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~420mA D5 – 6~420mA D6 – 6~420mA	P
	- tripping current between $I_{\Delta n}$ and 14 $I_{\Delta n}$ (mA) ..... :	D4 – 129~138mA D5 – 127~135mA D6 – 130~137mA	P
b)	S1 and RCCB in the closed position, residual current correspond to 1000Hz suddenly established by closing S2		P
	RCCB shall trip with a test current of 14 $I_{\Delta n}$ (ms) :	D4 – 20 D5 – 19 D6 – 22	P
	max. break time:		--
	- general type RCCBs: 0,3s		P
	- S type RCCBs: 0,5s		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: 14 $I_{\Delta n}$; 0,13 s :	D4 - D5 - D6 -	N/A
9.2.1.3 addition acc. IEC 62423	Verification of the correct operation in the case of a residual alternating current superimposed on a residual smooth direct current		--
	Test acc. figure 4		P
	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual smooth direct current applied through one pole chosen at random and adjusted to		--
	- 0,4 $I_{\Delta n}$ or	12mA	P
	- 10 mA		N/A
	whichever is the higher value		P
	Residual alternating current at rated frequency applied to another pole and:	Both 50Hz and 60Hz	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- steady increase from max. 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~30mA D5 – 6~30mA D6 – 6~30mA	P
	- alternating tripping current ≤ $I_{\Delta n}$(mA) ..... :	D4 – 19,5~21,5mA D5 – 19,7~21,5mA D6 – 20,1~21,6mA	P
	Test made twice at each position I and II of S_3		P
9.2.1.4 addition acc. IEC 62423	Verification of the correct operation in the case of a residual pulsating direct current superimposed on a residual smooth direct current		--
	Test acc. figure 5		P
	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual smooth direct current applied through one pole chosen at random and adjusted to		--
	- 0,4 $I_{\Delta n}$ or	12mA	P
	- 10 mA		N/A
	whichever is the higher value		P
	Residual pulsating direct current applied to another pole with a current delay angle of 0° and:		P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 1,4 $I_{\Delta n}$ within 30 s (mA) for RCCBs with $I_{\Delta n}$>0,01 A..... :	D4 – 6~42mA D5 – 6~42mA D6 – 6~42mA	P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) for RCCBs with $I_{\Delta n}$≤0,01 A..... :	D4 - D5 - D6 -	N/A
	RCCB tested twice at each position I and II of S_3 and S_4		P
	- residual pulsating tripping current ≤ 1,4 $I_{\Delta n}$(mA) for RCCBs with $I_{\Delta n}$>0,01 A..... :	D4 – 23,6~29,5mA D5 – 23,6~29,9mA D6 – 23,5~29,3mA	P
	- residual pulsating tripping current ≤ 2 $I_{\Delta n}$(mA) for RCCBs with $I_{\Delta n}$≤0,01 A..... :	D4 - D5 - D6 -	N/A
9.2.1.5 addition acc. IEC 62423	Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Test acc. figure 6a		P
a)	Test switch S_1 and S_2 and RCCB in closed position		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Residual pulsating direct current:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~60mA D5 – 6~60mA D6 – 6~60mA	P
	-tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ ..... :	D4 – 32,4~34,7mA D5 – 32,9~35,1mA D6 – 32,5~34,9mA	P
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 151 D5 – 152 D6 – 152	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 27 D5 – 27 D6 – 28	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 21 D5 – 20 D6 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.6 addition acc. IEC 62423	Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--
	Test acc. figure 6b		P
a)	Test switch S_1 and S_2 and RCCB in closed position		P
	Residual pulsating direct current:		--
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~60mA D5 – 6~60mA D6 – 6~60mA	P
	-tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ ..... :	D4 – 32,4~33,8mA D5 – 32,5~34,2mA D6 – 32,5~33,9mA	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 151 D5 – 151 D6 – 152	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 28 D5 – 27 D6 – 29	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 21 D5 – 19 D6 – 20	P
	No value exceeds the relevant specified limiting value		P
9.2.1.7.2 addition acc. IEC 62423	Verification of the correct operation in case of residual smooth direct current with load ,test acc. figure 6b		--
	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	- test current (A): In, until steady state conditions are reached ..... :	63	P
	- cross-sectional area (mm²) ..... :	16 mm^2	P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) ..... :	D4 – 6~60mA D5 – 6~60mA D6 – 6~60mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ (mA) . :	D4 – 32,6~33,2mA D5 – 32,5~34,0mA D6 – 32,5~33,7mA	P
9.2.2 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Tests at the temperature limits		--
	tests acc. 9.2.1.5 b), 9.2.1.6 b) and 9.2.1.7.1 b) under the following conditions:		P
	- ambient temperature: -5°C, off load	-5°C	P
	- ambient temperature: +40°C RCCB previously loaded with rated current until steady state conditions are reached	+40°C	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.1.5 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Tests repeated at a temperature of -5 °C:	-5°C	P
	Test acc. figure 6a		P
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 151 D5 – 152 D6 – 151	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 28 D5 – 26 D6 – 27	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 21 D5 – 22 D6 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.6 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--
	Tests repeated at a temperature of -5 °C:	-5 °C	P
	Test acc. figure 6b		P
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 149 D5 – 150 D6 – 149	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 29 D5 – 29 D6 – 29	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 26 D5 – 21 D6 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load ,test acc. figure 6b		P
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	Tests repeated at a temperature of -5 °C:	-5 °C	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D4 – 149 D5 – 150 D6 – 151	P
	- maximum break time (ms) at: 4 $I_{\Delta n}$ ..... :	D4 – 28 D5 – 30 D6 – 29	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ ..... :	D4 – 21 D5 – 21 D6 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.5 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from two phases		--
	Tests repeated at a temperature of +40 °C:	+40 °C	P
	- test current (A): In, until steady state conditions are reached ..... :	63	P
	- cross-sectional area (mm²) ..... :	16	P
	Test acc. figure 6a		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
b)	The test circuit being successively calibrated at any three values of residual current given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	RCCB connected at two-line terminals chosen at random		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 152 D5 – 150 D6 – 151	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 29 D5 – 29 D6 – 29	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 24 D5 – 22 D6 – 24	P
	No value exceeds the relevant specified limiting value		P
9.2.1.6 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of a residual direct currents which may result from rectifying circuits supplied from three phases		--
	Tests repeated at a temperature of +40 °C:	40°C	P
	- test current (A): In, until steady state conditions are reached ..... :	63	P
	- cross-sectional area (mm²) ..... :	16	P
	Test acc. figure 6b		P
b)	The test circuit being successively calibrated at 2 $I_{\Delta n}$ and any other two chosen values given in Table 1 taken at random, the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I and II		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 148 D5 – 152 D6 – 149	P
	- maximum break time (ms) at:4 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 28 D5 – 29 D6 – 29	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 10 $I_{\Delta n}$ (value given in table 1) ..... :	D4 – 23 D5 – 21 D6 – 21	P
	No value exceeds the relevant specified limiting value		P
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load ,test acc. figure 6b		--
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	Tests repeated at a temperature of +40°C:	+40°C	P
	- test current (A): In, until steady state conditions are reached ..... :	63	P
	- cross-sectional area (mm²) ..... :	16	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ..... :	D4 – 148 D5 – 148 D6 – 148	P
	- maximum break time (ms) at: 4 $I_{\Delta n}$ ..... :	D4 – 28 D5 – 28 D6 – 28	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ ..... :	D4 – 20 D5 – 21 D6 – 19	P
	No value exceeds the relevant specified limiting value		P

	Tests "D1"		
8.12	RCCBs functionally dependent on line voltage		--
	RCCBs functionally dependent on the line voltage, shall operate correctly between 0,85 and 1,1 times their rated voltage; voltage (V) .....:		N/A
	Multipole RCCBs shall have all current paths supplied from the phases and neutral, if any		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D4 – D5 – D6 –	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	D4 – D5 – D6 –	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	D4 – D5 – D6 –	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	D4 – D5 – D6 –	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	D4 – D5 – D6 –	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		N/A
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	D4 – D5 – D6 –	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	D4 – D5 – D6 –	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	D4 – D5 – D6 –	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 500 A .....:	D4 – D5 – D6 –	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D4 – D5 – D6 –	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D4 – D5 – D6 –	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 500 A .....:	D4 – D5 – D6 –	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D4 – D5 – D6 –	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D4 – D5 – D6 –	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
8.14	Behaviour of RCCBs in case of current surges caused by impulse voltages		--
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		--
9.19.1	Current surge test for all RCCBs (0,5µs/100kHz ring wave test)		--
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		--
	- peak value: 200 A + 10/0%	200A	P
	- virtual front time: 0,5 µs ± 30%	0,5µs	P
	- period of the following oscillatory wave: 10 µs ± 20%	10µs	P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
	During the test the RCCB shall not trip .....:	D4 – Not trip D5 – Not trip D6 – Not trip	P
	- break time (ms) at: $I_{\Delta n}$ .....:	D4 – 115 D5 – 112 D6 – 114	P
9.19.2 9.1.5 addition acc. IEC 62423	Verification of behaviour at surge currents up to 3000A (8/20µs surge current)		--
9.19.2.1	Test conditions		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		--
	Peak value: 3000A +10/-0%	3000A	P
	Virtual front time: 0,8µs ± 20%	0,8 µs	P
	Virtual time of half value: 20µs ± 20%	20µs	P
	Peak of reverse current: less than 30 % of peak value		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
9.19.2.2	During the test the RCCB shall not trip	D4 – D5 – D6 –	N/A
	- break time (ms) at $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed	D4 – not trip D5 – not trip D6 – not trip	P
	- break time (ms) at $I_{\Delta n}$ .....:	D4 – 118 D5 – 116 D6 – 115	P
9.1.6 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of behaviour in the case of inrush residual currents		--
	Test acc. figure 2		N/A
	all switches and RCCB in closed position		N/A
	pulse with a peak current of 10 $I_{\Delta n}$ ..... (mA):		N/A
	Pulse on one pole chosen at random		N/A
	Six measurements: 3 times positive, 3 times negative		N/A
	Polarity changed after each test		N/A
	No tripping during test		N/A
9.1.4 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of the correct operation for four-pole Type F RCCDs powered on two poles only		--

IEC 62423						
Clause	Requirement + Test				Result - Remark	Verdict
	Tests performed with a four-pole RCCB acc. 9.1.2, but only supplied between neutral terminal and one-phase terminal chosen at random without load					N/A
9.1.2 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** Verification of the correct operation in case of steady increase of composite residual current					--
	starting composite residual current:					--
	Different frequency component values of test currents for calibration (RMS)			Composite starting current value (RMS)		--
	$I_{at\ rated\ frequency}$	I_{1kHz}	$I_{F\ motor\ (10Hz)}$	I_{Δ}		--
	0,138 $I_{\Delta N}$	0,138 $I_{\Delta N}$	0,035 $I_{\Delta N}$	0,2 $I_{\Delta N}$		--
	S1, S2 and RCCB in the closed position, residual current steady increase, starting from a value not higher than the starting composite value to attain the upper limit of residual operating current (1,4 $I_{\Delta N}$) within 30 s					N/A
	- tripping current between 0,5 $I_{\Delta N}$ and 1,4 $I_{\Delta n}$ (mA) .....:					N/A
9.2.3 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Correct operation for RCCBs powered on two poles					--
	tests acc. 9.2.1.2 and 9.2.1.7.1					P
	RCCB only supplied between neutral terminal and one-phase terminal chosen at random for four-pole devices or					P
	RCCB only supplied between 2-phase terminals chosen at random for 3-pole devices					N/A
	Tests at rated frequency and without load					P
9.2.1.2 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual sinusoidal alternating currents up to 1000 Hz					--
a)	Test switch S_1 and S_2 and RCCB in closed position					P
	Test at 150Hz:					P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2,4 $I_{\Delta n}$ within 30 s (mA) .....:				D4 – 6~72mA D5 – 6~72mA D6 – 6~72mA	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between 0,5 $I_{\Delta n}$ and 2,4 $I_{\Delta n}$ (mA) :	D4 – 25,1~25,9mA D5 – 25,5~26,1mA D6 – 25,6~26,2mA	P
	Test at 400Hz:		P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 6 $I_{\Delta n}$ within 30 s (mA) .....:	D4 – 6~180mA D5 – 6~180mA D6 – 6~180mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 6 $I_{\Delta n}$ (mA) ..:	D4 – 39,8~41,4mA D5 – 40,5~41,1mA D6 – 39,6~41,3mA	P
	Test at 1000Hz:		P
	- steady increase from max. 0,2 $I_{\Delta n}$ to 14 $I_{\Delta n}$ within 30 s (mA) .....:	D4 – 6~420mA D5 – 6~420mA D6 – 6~420mA	P
	- tripping current between $I_{\Delta n}$ and 14 $I_{\Delta n}$ (mA) .....:	D4 – 127~136mA D5 – 124~131mA D6 – 130~135mA	P
b)	S1 and RCCB in the closed position, residual current correspond to 1000Hz suddenly established by closing S2		P
	RCCB shall trip with a test current of 14 $I_{\Delta n}$ (ms) :	D4 – 18 D5 – 18 D6 – 21	P
	max. break time:		--
	- general type RCCBs: 0,3s		P
	- S type RCCBs: 0,5s		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: 14 $I_{\Delta n}$; 0,13 s :	D4 – D5 – D6 –	N/A
9.2.1.7.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the correct operation in case of residual smooth direct current without load for ratings of $I_{\Delta n}$, test acc. figure 6b		P
a)	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	Test switch S_1 and S_2 and RCCB in closed position		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- steady increase from max. 0,2 $I_{\Delta n}$ to 2 $I_{\Delta n}$ within 30 s (mA) .....:	D4 – 6~60mA D5 – 6~60mA D6 – 6~60mA	P
	- tripping current between 0,5 $I_{\Delta n}$ and 2 $I_{\Delta n}$ (mA) ..:	D4 – 32,4~33,3mA D5 – 32,3~33,2mA D6 – 32,8~33,5mA	P
b)	The test circuit being successively calibrated at each of the values of residual current specified in Table 1 (except 5A, 10A, 20A, 50A, 100A and 200A), the test switch S_1 and the RCCB being in the closed position, residual current suddenly establish by closing test switch S_2, S_3 in position I or II chosen at random		--
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D4 – 152 D5 – 151 D6 – 149	P
	- maximum break time (ms) at: 4 $I_{\Delta n}$ .....:	D4 – 29 D5 – 29 D6 – 29	P
	- maximum break time (ms) at: 10 $I_{\Delta n}$ .....:	D4 – 21 D5 – 19 D6 – 20	P
	No value exceeds the relevant specified limiting value		P
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$ .....:	1000A	--
	Test circuit according to figure .....:	Figure 7	--
	Point of test circuit which is directly earthed .....:	Supply side	--
	Grid distance "a" (mm) .....:	35	--
	Prospective current (A) .....:	1000	--
	Prospective current obtained (A) .....:	255V/1,02x10^3A	--
	Power factor .....:	0,93~0,98	--
	Power factor obtained .....:	0,97	--
	Point of initiation: 45° ± 5°	45°	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	O-CO-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P

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Clause	Requirement + Test	Result - Remark	Verdict
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	D4 – 3,40 D5 – 5,22 D6 – 6,37	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		--
	a) .....:	D4 – OK D5 – OK D6 – OK	P
	b) .....:	D4 – OK D5 – OK D6 – OK	P
	c) .....:	D4 – OK D5 – OK D6 – OK	P
	d) .....:	D4 – D5 – D6 –	N/A
	e) .....:	D4 – D5 – D6 –	N/A
	No flashover or breakdown .....:	D4 – OK D5 – OK D6 – OK	P
	Making and breaking In at Un .....:	D4 – OK D5 – OK D6 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	D4 – 188 D5 – 195 D6 – 196	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D4 – D5 – D6 –	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- all values less than 0,85 times the rated voltage (V) .....:	D4 – D5 – D6 –	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	D4 – D5 – D6 –	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	D4 – D5 – D6 –	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	D4 – D5 – D6 –	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	D4 – D5 – D6 –	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	D4 – D5 – D6 –	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	D4 – D5 – D6 –	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 500 A .....:	D4 – D5 – D6 –	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D4 – D5 – D6 –	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D4 – D5 – D6 –	N/A
	- maximum break time (ms) at: 500 A .....:	D4 – D5 – D6 –	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D4 – D5 – D6 –	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D4 – D5 – D6 –	N/A
	No tripping during tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
8.11	Test device		--
	RCCBs shall be provided with a test device		P
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$	Ampere-turns: 46,8mA-turns 2,5 times the ampere-turns: 75,0mA-turns	P
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.16	Verification of the operation of the test device at the limits of rated voltage:		--
	a) RCCB at 0,85 times the rated voltage, test device actuated 25 times at intervals of 5 s .....:	D4 – 340V D5 – 340V D6 – 340V	P
	b) test a) repeated at 1,1 times the rated voltage :	D4 – 457V D5 – 457V D6 – 457V	P
	c) test b) repeated, but only once, the operating means of the test device being held in the closed position for 30 s .....:	D4 – OK D5 – OK D6 – OK	P
	RCCB operated at each test .....:	D4 – Operated D5 – Operated D6 – Operated	P
	No change impairing further use .....:	D4 – OK D5 – OK D6 – OK	P
8.8	Resistance to mechanical shock and impact		--
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		--
	Mechanical shock: 50 falls of 40 mm on one side; 50 falls on opposite side C turned through 90°; 50 falls on one side; 50 falls on opposite side		P

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Clause	Requirement + Test	Result - Remark	Verdict
	No opening of RCCB during the test .....:	D4 – OK D5 – OK D6 – OK	P
9.12.2	Mechanical impact		--
9.12.2.1	Impact test (10 blows, height 10 cm): no damage :	D4 – no damage D5 – no damage D6 – no damage	P
9.12.2.2	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min		P
	RCCB shall not become loose during test and no damage impairing its further use .....:	D4 – OK D5 – OK D6 – OK	P
9.12.2.3	RCCBs of plug-in type (under consideration)		--
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		--
	RCCBs shall not operate under specified conditions of overcurrent		P
9.18.1	Verification of the limiting value of overcurrent in case of a load through a RCCB with two poles		--
	RCCB connected as for normal use with a load equal to (A): 6 In switched on using a two-pole test switch for 1 s .....:		N/A
	Test repeated three times with an interval of at least 1 min .....:	D4 – D5 – D6 –	N/A
	The RCCB shall not open .....:	D4 – D5 – D6 –	N/A
	RCCBs functionally dependent on the line voltage at rated voltage (Un) .....:		N/A
9.18.2	Verification of the limiting value of overcurrent in case of a single phase load through a three-pole or four-pole RCCB		--
	RCCB connected according to fig. 22		P
	Test current (A): 6 In closed by S1 for 1 s .....:	380A, 1s	--

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Clause	Requirement + Test	Result - Remark	Verdict
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min .....:	D4 – 380A, 1s D5 – 380A, 1s D6 – 380A, 1s	P
	The RCCB shall not open .....:	D4 – Not trip D5 – Not trip D6 – Not trip	P
	RCCBs functionally dependent on the line voltage at rated voltage	246V/426V	P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	D4 – 96 D5 – 99 D6 – 95	P

	Tests "D2" 3 samples: 230V/240V, 63A, 30mA, 1P+N	**D_2-1**	**D_2-2**	**D_2-3**	
9.11.2.3c)	Verification of suitability in IT system: .....:				--
	Test circuit according to figure .....:	Figure 8			--
	Point of test circuit which is directly earthed .....:	Supply side			--
	Grid distance "a" (mm) .....:	35			--
	Test voltage 105% of rated phase to neutral voltage for the pole exclusively for the neutral	256V			--
	Test voltage 105% of rated phase to phase voltage for the other poles				--
	Prospective current - ~~500A~~ or - 10 I_n (A) .....:	10×63A			--
	Prospective current (A) .....:	630A			--
	Prospective current obtained (A) .....:	645A			--
	Power factor .....:	0,93~0,98			--
	Power factor obtained .....:	0,97			--
	Point of initiation: 0 ± 5° for the first tested pole, shifted by 30° for the other poles				P
	Test sequence: O-t-CO on each pole in turn excluding the switched neutral pole				P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F				P
	After the tests no damage impairing further use				P

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Clause	Requirement + Test	Result - Remark	Verdict
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	D2-1 – 4,37 D2-2 – 3,56 D2-3 – 3,74	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		--
	a) .....:	D2-1 – OK D2-2 – OK D2-3 – OK	P
	b) .....:	D2-1 – OK D2-2 – OK D2-3 – OK	P
	c) .....:	D2-1 – OK D2-2 – OK D2-3 – OK	P
	d) .....:	D2-1 - D2-2 - D2-3 -	N/A
	e) .....:	D2-1 - D2-2 - D2-3 -	N/A
	No flashover or breakdown .....:	D2-1 – OK D2-2 – OK D2-3 – OK	P
	Making and breaking In at Un .....:	D2-1 – OK D2-2 – OK D2-3 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	D2-1 – 167 D2-2 – 182 D2-3 – 185	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D2-1 - D2-2 - D2-3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- all values less than 0,85 times the rated voltage (V) .....:	D2-1 - D2-2 - D2-3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	D2-1 - D2-2 - D2-3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	D2-1 - D2-2 - D2-3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	D2-1 - D2-2 - D2-3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	D2-1 - D2-2 - D2-3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	D2-1 - D2-2 - D2-3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	D2-1 - D2-2 - D2-3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D2-1 - D2-2 - D2-3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D2-1 - D2-2 - D2-3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D2-1 - D2-2 - D2-3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D2-1 - D2-2 - D2-3 -	N/A
	- maximum break time (ms) at: 500 A .....:	D2-1 - D2-2 - D2-3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D2-1 - D2-2 - D2-3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D2-1 - D2-2 - D2-3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D2-1 - D2-2 - D2-3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D2-1 - D2-2 - D2-3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D2-1 - D2-2 - D2-3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D2-1 - D2-2 - D2-3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D2-1 - D2-2 - D2-3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D2-1 - D2-2 - D2-3 -	N/A
	- maximum break time (ms) at: 500 A .....:	D2-1 - D2-2 - D2-3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D2-1 - D2-2 - D2-3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D2-1 - D2-2 - D2-3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D2-1 - D2-2 - D2-3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D2-1 - D2-2 - D2-3 -	N/A
	No tripping during tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.2.4 addition acc. IEC 62423	Only applicable for RCCBs of type B: The RCCB shall trip with a test current of 2,5 I∆n with smooth direct current maximum break time (ms) :	D2-1 – 107 D2-2 – 114 D2-3 – 104	P

	Tests "D2" 3 samples: 400V415V, 63A, 30mA, 3P+N	**D_2-4**	**D_2-5**	**D_2-6**	
9.11.2.3c)	Verification of suitability in IT system: .....:				--
	Test circuit according to figure .....:	Figure 8			--
	Point of test circuit which is directly earthed .....:	Supply side			--
	Grid distance "a" (mm) .....:	35			--
	Test voltage 105% of rated phase to neutral voltage for the pole exclusively for the neutral				--
	Test voltage 105% of rated phase to phase voltage for the other poles	444V			--
	Prospective current - ~~500A or~~ - 10 I_n (A) .....:	10×63A			--
	Prospective current (A) .....:	630A			--
	Prospective current obtained (A) .....:	645A			--
	Power factor .....:	0,93~0,98			--
	Power factor obtained .....:	0,97			--
	Point of initiation: 0 ± 5° for the first tested pole, shifted by 30° for the other poles				P
	Test sequence: O-t-CO on each pole in turn excluding the switched neutral pole				P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F				P
	After the tests no damage impairing further use				P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (µA)	D2-4 – 5,54 D2-5 – 4,87 D2-6 – 5,20			P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:				--
	a) .....:	D2-4 – OK D2-5 – OK D2-6 – OK			P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) .....:	D2-4 – OK D2-5 – OK D2-6 – OK	P
	c) .....:	D2-4 – OK D2-5 – OK D2-6 – OK	P
	d) .....:	D2-4 - D2-5 - D2-6 -	N/A
	e) .....:	D2-4 - D2-5 - D2-6 -	N/A
	No flashover or breakdown .....:	D2-4 – OK D2-5 – OK D2-6 – OK	P
	Making and breaking In at Un .....:	D2-4 – OK D2-5 – OK D2-6 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	D2-4 – 105 D2-5 – 95 D2-6 – 102	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D2-4 - D2-5 - D2-6 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	D2-4 - D2-5 - D2-6 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	D2-4 - D2-5 - D2-6 -	N/A
	No value exceeds the specified limiting values		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux .....:	D2-4 - D2-5 - D2-6 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	D2-4 - D2-5 - D2-6 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	D2-4 - D2-5 - D2-6 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	D2-4 - D2-5 - D2-6 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	D2-4 - D2-5 - D2-6 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D2-4 - D2-5 - D2-6 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D2-4 - D2-5 - D2-6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D2-4 - D2-5 - D2-6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D2-4 - D2-5 - D2-6 -	N/A
	- maximum break time (ms) at: 500 A .....:	D2-4 - D2-5 - D2-6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D2-4 - D2-5 - D2-6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D2-4 - D2-5 - D2-6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D2-4 - D2-5 - D2-6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D2-4 - D2-5 - D2-6 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	D2-4 - D2-5 - D2-6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	D2-4 - D2-5 - D2-6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	D2-4 - D2-5 - D2-6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	D2-4 - D2-5 - D2-6 -	N/A
	- maximum break time (ms) at: 500 A .....:	D2-4 - D2-5 - D2-6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D2-4 - D2-5 - D2-6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	D2-4 - D2-5 - D2-6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	D2-4 - D2-5 - D2-6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	D2-4 - D2-5 - D2-6 -	N/A
	No tripping during tests		N/A
9.2.4 addition acc. IEC 62423	Only applicable for RCCBs of type B: The RCCB shall trip with a test current of 2,5 IΔn with smooth direct current maximum break time (ms) :	D2-4 – 108 D2-5 – 95 D2-6 – 101	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE E 3 samples: 230V/240V, 63A, 30mA, 1P+N	**E-1**	**E-2**	**E-3**	
8.7	**Performance at short-circuit currents**				--
9.11.2.4	a) Verification of the coordination between the RCCB and the SCPD				--
	Verification of the coordination at the rated conditional short-circuit current (A): Inc .....:	10kA			--
	Test circuit according to figure .....:	Figure 7			--
	Point of test circuit which is directly earthed .....:	Supply side			--
	Grid distance "a" (mm) .....:	50			--
	Silver wire diameter (mm) or fuse .....:	Φ0,70			--
	Prospective current (A) .....:	10kA			--
	Prospective current obtained (A) .....:	255V/10,2x10^3			--
	Power factor .....:	0,45~0,50			--
	Power factor obtained .....:	0,49			--
	Point of initiation: 45° ± 5°				P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing ((≥1x ≤1,1x values of table 18), RCCB replaced by a connection having negligible impedance	I^2t =24kA^2s Ip =4,35kA			P
	Test sequence: O-t-CO				P
	I^2t (kA^2s); Ip (kA) .....:	E1 – 26,7 kA^2s / 4,81kA E2 – 31,0 kA^2s / 4,72kA E3 – 25,8 kA^2s / 4,82kA			P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F				P
	After the tests no damage impairing further use				P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	E1 – 2,95 E2 – 4,14 E3 – 3,85			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				--
	a) .....:	E1 – OK E2 – OK E3 – OK			P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) .....:	E1 – OK E2 – OK E3 – OK	P
	c) .....:	E1 – OK E2 – OK E3 – OK	P
	d) .....:	E1 - E2 - E3 -	N/A
	e) .....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown .....:	E1 – OK E2 – OK E3 – OK	P
	Making and breaking In at Un .....:	E1 – OK E2 – OK E3 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	E1 – 184 E2 – 168 E3 – 179	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux .....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A .....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		----

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A .....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.11.2.2	Verification of the rated making and breaking capacity (A): Im .....:	1000A	--
	Test circuit according to figure .....:	Figure 7	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Residual operating current (A): 10 $I_{\Delta n}$ .....:	300mA	--
	Point of test circuit which is directly earthed .....:	Supply side	--
	Grid distance "a" (mm) .....:	35	--
	Prospective current (A) .....:	1000A	--
	Prospective current obtained (A) .....:	255V/1,02x10^3	--
	Power factor .....:	0,93~0,98	--
	Power factor obtained .....:	0,97	--
	Point of initiation: 45° ± 5°		P
	Test sequence: CO-t-CO-t-CO		P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	E1 – 3,42 E2 – 4,51 E3 – 4,27	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--
	a) .....:	E1 – OK E2 – OK E3 – OK	P
	b) .....:	E1 – OK E2 – OK E3 – OK	P
	c) .....:	E1 – OK E2 – OK E3 – OK	P
	d) .....:	E1 - E2 - E3 -	N/A
	e) .....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown	E1 – OK E2 – OK E3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un .....:	E1 – OK E2 – OK E3 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	E1 – 167 E2 – 172 E3 – 174	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A .....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A .....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	E1 – 105 E2 – 102 E3 – 96	P

	TEST SEQUENCE E 3 samples: 400V415V, 63A, 30mA, 3P+N	**E-4**	**E-5**	**E-6**	
8.7	**Performance at short-circuit currents**				--
9.11.2.4	a) Verification of the coordination between the RCCB and the SCPD				--
	Verification of the coordination at the rated conditional short-circuit current (A): Inc .....:	10kA			--
	Test circuit according to figure .....:	Figure 7			--
	Point of test circuit which is directly earthed .....:	Supply side			--
	Grid distance "a" (mm) .....:	50			--
	Silver wire diameter (mm) or fuse .....:	Φ0,70			--
	Prospective current (A) .....:	10kA			--
	Prospective current obtained (A) .....:	444V/10,2x10^3			--
	Power factor .....:	0,45~0,50			--
	Power factor obtained .....:	0,49			--
	Point of initiation: 45° ± 5°				P

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Clause	Requirement + Test	Result - Remark	Verdict
	Verification of I²t (kA²s) and Ip (kA) prior to testing ((≥1x ≤1,1x values of table 18), RCCB replaced by a connection having negligible impedance	I²t =24kA²s Ip =4,3kA	P
	Test sequence: O-t-CO		P
	I²t (kA²s); Ip (kA) .....:	E4 – 54,0 kA²s / 4,63kA E5 – 72,7 kA²s / 4,82kA E6 – 56,7 kA²s / 4,79kA	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	E4 – 4,87 E5 – 5,20 E6 – 4,26	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--
	a) .....:	E4 – OK E5 – OK E6 – OK	P
	b) .....:	E4 – OK E5 – OK E6 – OK	P
	c) .....:	E4 – OK E5 – OK E6 – OK	P
	d) .....:	E4 - E5 - E6 -	N/A
	e) .....:	E4 - E5 - E6 -	N/A
	No flashover or breakdown .....:	E4 – OK E5 – OK E6 – OK	P
	Making and breaking In at Un .....:	E4 – OK E5 – OK E6 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	E4 – 104 E5 – 95 E6 – 94	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E4 - E5 - E6 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	E4 - E5 - E6 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	E4 - E5 - E6 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	E4 - E5 - E6 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	E4 - E5 - E6 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	E4 - E5 - E6 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	E4 - E5 - E6 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	E4 - E5 - E6 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 500 A .....:	E4 - E5 - E6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E4 - E5 - E6 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	E4 - E5 - E6 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		----
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 500 A .....:	E4 - E5 - E6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	E4 - E5 - E6 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.11.2.2	Verification of the rated making and breaking capacity (A): Im .....:	1000A	--
	Test circuit according to figure .....:	Figure 7	--
	Residual operating current (A): 10 $I_{\Delta n}$ .....:	300mA	--
	Point of test circuit which is directly earthed .....:	Supply side	--
	Grid distance "a" (mm) .....:	35	--
	Prospective current (A) .....:	1000A	--
	Prospective current obtained (A) .....:	444V/1,02x10^3	--
	Power factor .....:	0,93~0,98	--
	Power factor obtained .....:	0,97	--
	Point of initiation: 45° ± 5°		P
	Test sequence: CO-t-CO-t-CO		P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	E4 – 4,92 E5 – 5,41 E6 – 4,56	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	a) .....:	E4 – OK E5 – OK E6 – OK	P
	b) .....:	E4 – OK E5 – OK E6 – OK	P
	c) .....:	E4 – OK E5 – OK E6 – OK	P
	d) .....:	E4 - E5 - E6 -	N/A
	e) .....:	E4 - E5 - E6 -	N/A
	No flashover or breakdown	E4 – OK E5 – OK E6 – OK	P
	Making and breaking In at Un .....:	E4 – OK E5 – OK E6 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	E4 – 102 E5 – 94 E6 – 99	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E4 - E5 - E6 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	E4 - E5 - E6 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	E4 - E5 - E6 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	E4 - E5 - E6 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	E4 - E5 - E6 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	E4 - E5 - E6 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	E4 - E5 - E6 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	E4 - E5 - E6 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 500 A .....:	E4 - E5 - E6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	E4 - E5 - E6 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	E4 - E5 - E6 -	N/A
	- maximum break time (ms) at: 500 A .....:	E4 - E5 - E6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	E4 - E5 - E6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	E4 - E5 - E6 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	E4 – 98 E5 – 101 E6 – 104	P

	TEST SEQUENCE F 3 samples: 230V/240V, 63A, 30mA, 1P+N	**F-1**	**F-2**	**F-3**	
8.7	**Performance at short-circuit currents**				--
9.11.2.4	Verification of the coordination between the RCCB and the SCPD				--
	b) Verification of the coordination at the rated making and breaking capacity (A): Im .....:	1000A			--
	Test circuit according to figure .....:	Figure 7			--
	Point of test circuit which is directly earthed .....:	Supply side			--
	Grid distance "a" (mm) .....:	35			--
	Silver wire diameter (mm) or fuse .....:	Φ 0,70			--
	Prospective current (A) .....:	1000A			--
	Prospective current obtained (A) .....:	255V/1,02x10^3			--
	Power factor .....:	0,93~0,98			--
	Power factor obtained .....:	0,97			--
	Point of initiation: 45° ± 5°				P
	Test sequence: O-t-CO-t-CO				P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F				P
	After the tests no damage impairing further use				P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	F1 – 3,68 F2 – 4,22 F3 – 4,02			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				--
	a) .....:	F1 – OK F2 – OK F3 – OK			P
	b) .....:	F1 – OK F2 – OK F3 – OK			P

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Clause	Requirement + Test	Result - Remark	Verdict
	c) .....:	F1 – OK F2 – OK F3 – OK	P
	d) .....:	F1 - F2 - F3 -	N/A
	e) .....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown .....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un .....:	F1 – OK F2 – OK F3 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	F1 – 186 F2 – 185 F3 – 176	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		----
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A .....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A .....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): IΔc .:	10kA	--
	Test circuit according to figure .....:	Figure 7	--
	Point of test circuit which is directly earthed .....:	Supply side	--
	Grid distance "a" (mm) .....:	50	--
	Silver wire diameter (mm) or fuse .....:	Φ 0,70	--

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Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current (A) .....:	10kA	--
	Prospective current obtained (A) .....:	255V/10,2x10^3	--
	Power factor .....:	0,45~0,50	--
	Power factor obtained .....:	0,49	--
	Point of initiation: 45° ± 5°		P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance	I^2t =24kA^2s Ip =4,3kA	P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA^2s); Ip (kA) .....:	F1 – 34,0kA^2s / 5,04kA F2 – 43,7kA^2s / 4,80kA F3 – 39,2kA^2s / 5,00kA	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	F1 – 4,29 F2 – 4,50 F3 – 4,36	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--
	a) .....:	F1 – OK F2 – OK F3 – OK	P
	b) .....:	F1 – OK F2 – OK F3 – OK	P
	c) .....:	F1 – OK F2 – OK F3 – OK	P
	d) .....:	F1 - F2 - F3 -	N/A
	e) .....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No flashover or breakdown .....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un .....:	F1 – OK F2 – OK F3 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	F1 – 178 F2 – 185 F3 – 182	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A .....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 500 A .....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	F1 – 105 F2 – 96 F3 – 95	P

	TEST SEQUENCE F 3 samples: 230V/240V, 16A, 300mA, 1P+N	**F-4**	**F-5**	**F-6**	
8.7	**Performance at short-circuit currents**				--
9.11.2.4	Verification of the coordination between the RCCB and the SCPD				--
	b) Verification of the coordination at the rated making and breaking capacity (A): Im .....:	1000A			--
	Test circuit according to figure .....:	Figure 7			--
	Point of test circuit which is directly earthed .....:	Supply side			--
	Grid distance "a" (mm) .....:	35			--
	Silver wire diameter (mm) or fuse .....:	Φ 0,35			--
	Prospective current (A) .....:	1000A			--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current obtained (A) .....:	255V/1,02x10^3	--
	Power factor .....:	0,93~0,98	--
	Power factor obtained .....:	0,97	--
	Point of initiation: 45° ± 5°		P
	Test sequence: O-t-CO-t-CO		P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (µA)	F4 – 3,85 F5 – 2,94 F6 – 3,08	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--
	a) .....:	F4 – OK F5 – OK F6 – OK	P
	b) .....:	F4 – OK F5 – OK F6 – OK	P
	c) .....:	F4 – OK F5 – OK F6 – OK	P
	d) .....:	F4 - F5 - F6 -	N/A
	e) .....:	F4 - F5 - F6 -	N/A
	No flashover or breakdown .....:	F4 – OK F5 – OK F6 – OK	P
	Making and breaking In at Un .....:	F4 – OK F5 – OK F6 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	F4 – 45 F5 – 36 F6 – 39	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		----
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F4 - F5 - F6 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	F4 - F5 - F6 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	F4 - F5 - F6 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	F4 - F5 - F6 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	F4 - F5 - F6 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	F4 - F5 - F6 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	F4 - F5 - F6 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	F4 - F5 - F6 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 500 A .....:	F4 - F5 - F6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F4 - F5 - F6 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F4 - F5 - F6 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 500 A .....:	F4 - F5 - F6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F4 - F5 - F6 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): IΔc .:	10kA	--
	Test circuit according to figure .....:	Figure 7	--
	Point of test circuit which is directly earthed .....:	Supply side	--
	Grid distance "a" (mm) .....:	50	--
	Silver wire diameter (mm) or fuse .....:	Φ 0,35	--
	Prospective current (A) .....:	10kA	--
	Prospective current obtained (A) .....:	255V/10,2x10^3	--
	Power factor .....:	0,45~0,50	--
	Power factor obtained .....:	0,49	--
	Point of initiation: 45° ± 5°		P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 18), RCCB replaced by a connection having negligible impedance	I^2t =1,9kA^2s Ip =1,45kA	P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA^2s); Ip (kA) .....:	F4 – 9,37kA^2s / 2,23kA F5 – 14,6kA^2s / 2,32kA F6 – 9,13kA^2s / 2,22kA	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P

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Clause	Requirement + Test	Result - Remark	Verdict
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	F4 – 4,02 F5 – 3,42 F6 – 3,42	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--
	a) .....:	F4 – OK F5 – OK F6 – OK	P
	b) .....:	F4 – OK F5 – OK F6 – OK	P
	c) .....:	F4 – OK F5 – OK F6 – OK	P
	d) .....:	F4 - F5 - F6 -	N/A
	e) .....:	F4 - F5 - F6 -	N/A
	No flashover or breakdown .....:	F4 – OK F5 – OK F6 – OK	P
	Making and breaking In at Un .....:	F4 – OK F5 – OK F6 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	F4 – 39 F5 – 42 F6 – 45	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F4 - F5 - F6 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- all values less than 0,85 times the rated voltage (V) .....:	F4 - F5 - F6 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	F4 - F5 - F6 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	F4 - F5 - F6 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	F4 - F5 - F6 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	F4 - F5 - F6 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	F4 - F5 - F6 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	F4 - F5 - F6 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 500 A .....:	F4 - F5 - F6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F4 - F5 - F6 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F4 - F5 - F6 -	N/A
	- maximum break time (ms) at: 500 A .....:	F4 - F5 - F6 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F4 - F5 - F6 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F4 - F5 - F6 -	N/A
	No tripping during tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	F4 – 84 F5 – 95 F6 – 93	P

	TEST SEQUENCE F 3 samples: 400V415V, 63A, 30mA, 3P+N	**F-7**	**F-8**	**F-9**	
8.7	**Performance at short-circuit currents**				--
9.11.2.4	Verification of the coordination between the RCCB and the SCPD				--
	b) Verification of the coordination at the rated making and breaking capacity (A): Im .....:	1000A			--
	Test circuit according to figure .....:	Figure 7			--
	Point of test circuit which is directly earthed .....:	Supply side			--
	Grid distance "a" (mm) .....:	35			--
	Silver wire diameter (mm) or fuse .....:	Φ 0,70			--
	Prospective current (A) .....:	1000A			--
	Prospective current obtained (A) .....:	444V/1,02x10^3			--
	Power factor .....:	0,93~0,98			--
	Power factor obtained .....:	0,97			--
	Point of initiation: 45° ± 5°				P
	Test sequence: O-t-CO-t-CO				P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F				P
	After the tests no damage impairing further use				P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	F7 – 4,31 F8 – 5,48 F9 – 6,05			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				--
	a) .....:	F7 – OK F8 – OK F9 – OK			P
	b) .....:	F7 – OK F8 – OK F9 – OK			P

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Clause	Requirement + Test	Result - Remark	Verdict
	c) .....:	F7 – OK F8 – OK F9 – OK	P
	d) .....:	F7 - F8 - F9 -	N/A
	e) .....:	F7 - F8 - F9 -	N/A
	No flashover or breakdown .....:	F7 – OK F8 – OK F9 – OK	P
	Making and breaking In at Un .....:	F7 – OK F8 – OK F9 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	F7 – 104 F8 – 95 F9 – 96	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		----
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F7 - F8 - F9 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	F7 - F8 - F9 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	F7 - F8 - F9 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	F7 - F8 - F9 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	F7 - F8 - F9 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	F7 - F8 - F9 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	F7 - F8 - F9 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	F7 - F8 - F9 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 500 A .....:	F7 - F8 - F9 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F7 - F8 - F9 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 500 A .....:	F7 - F8 - F9 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F7 - F8 - F9 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): IΔc .:	10kA	--
	Test circuit according to figure .....:	Figure 7	--
	Point of test circuit which is directly earthed .....:	Supply side	--
	Grid distance "a" (mm) .....:	50	--
	Silver wire diameter (mm) or fuse .....:	Φ 0,70	--

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Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current (A) .....:	10kA	--
	Prospective current obtained (A) .....:	255V/10,2x10^3	--
	Power factor .....:	0,45~0,50	--
	Power factor obtained .....:	0,49	--
	Point of initiation: 45° ± 5°		P
	Verification of I²t (kA²s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance	I²t =24kA²s Ip =4,3kA	P
	Test sequence: O-t-CO-t-CO		P
	I²t (kA²s); Ip (kA) .....:	F7 – 44,9kA²s / 4,52kA F8 – 27,1kA²s / 4,52kA F9 – 33,0kA²s / 4,52kA	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	F7 – 4,60 F8 – 5,68 F9 – 6,40	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--
	a) .....:	F7 – OK F8 – OK F9 – OK	P
	b) .....:	F7 – OK F8 – OK F9 – OK	P
	c) .....:	F7 – OK F8 – OK F9 – OK	P
	d) .....:	F7 - F8 - F9 -	N/A
	e) .....:	F7 - F8 - F9 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No flashover or breakdown .....:	F7 – OK F8 – OK F9 – OK	P
	Making and breaking In at Un .....:	F7 – OK F8 – OK F9 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	F7 – 94 F8 – 88 F9 – 96	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F7 - F8 - F9 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	F7 - F8 - F9 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	F7 - F8 - F9 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	F7 - F8 - F9 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	F7 - F8 - F9 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	F7 - F8 - F9 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	F7 - F8 - F9 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	F7 - F8 - F9 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 500 A .....:	F7 - F8 - F9 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F7 - F8 - F9 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F7 - F8 - F9 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F7 - F8 - F9 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 500 A .....:	F7 - F8 - F9 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F7 - F8 - F9 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F7 - F8 - F9 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	F7 – 105 F8 – 109 F9 – 101	P

	TEST SEQUENCE F 3 samples: 400V415V, 16A, 300mA, 3P+N	**F-10**	**F-11**	**F-12**	
8.7	**Performance at short-circuit currents**				--
9.11.2.4	Verification of the coordination between the RCCB and the SCPD				--
	b) Verification of the coordination at the rated making and breaking capacity (A): Im .....:	1000A			--
	Test circuit according to figure .....:	Figure 7			--
	Point of test circuit which is directly earthed .....:	Supply side			--
	Grid distance "a" (mm) .....:	35			--
	Silver wire diameter (mm) or fuse .....:	Φ 0,35			--
	Prospective current (A) .....:	1000A			--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current obtained (A) .....:	444V/1,02x10^3	--
	Power factor .....:	0,93~0,98	--
	Power factor obtained .....:	0,97	--
	Point of initiation: 45° ± 5°		P
	Test sequence: O-t-CO-t-CO		P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (µA)	F10 – 9,37 F11 – 4,58 F12 – 4,37	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--
	a) .....:	F10 – OK F11 – OK F12 – OK	P
	b) .....:	F10 – OK F11 – OK F12 – OK	P
	c) .....:	F10 – OK F11 – OK F12 – OK	P
	d) .....:	F10 - F11 - F12 -	N/A
	e) .....:	F10 - F11 - F12 -	N/A
	No flashover or breakdown .....:	F10 – OK F11 – OK F12 – OK	P
	Making and breaking In at Un .....:	F10 – OK F11 – OK F12 – OK	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	F10 – 28 F11 – 31 F12 – 35	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		----
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F10 - F11 - F12 -	N/A
	- all values less than 0,85 times the rated voltage (V) .....:	F10 - F11 - F12 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	F10 - F11 - F12 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	F10 - F11 - F12 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	F10 - F11 - F12 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	F10 - F11 - F12 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	F10 - F11 - F12 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	F10 - F11 - F12 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 500 A .....:	F10 - F11 - F12 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F10 - F11 - F12 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F10 - F11 - F12 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 500 A .....:	F10 - F11 - F12 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F10 - F11 - F12 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): I∆c .:	10kA	--
	Test circuit according to figure .....:	Figure 7	--
	Point of test circuit which is directly earthed .....:	Supply side	--
	Grid distance "a" (mm) .....:	50	--
	Silver wire diameter (mm) or fuse .....:	Φ 0,35	--
	Prospective current (A) .....:	10kA	--
	Prospective current obtained (A) .....:	255V/10,2x10^3	--
	Power factor .....:	0,45~0,50	--
	Power factor obtained .....:	0,49	--
	Point of initiation: 45° ± 5°		P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance	I^2t =1,9kA^2s Ip =1,45kA	P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA^2s); Ip (kA) .....:	F10 – 18,6kA^2s / 2,08kA F11 – 3,67kA^2s / 2,02kA F12 – 18,5kA^2s / 2,05kA	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (μA)	F10 – 5,60 F11 – 4,80 F12 – 4,58	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		--
	a) .....:	F10 – OK F11 – OK F12 – OK	P
	b) .....:	F10 – OK F11 – OK F12 – OK	P
	c) .....:	F10 – OK F11 – OK F12 – OK	P
	d) .....:	F10 - F11 - F12 -	N/A
	e) .....:	F10 - F11 - F12 -	N/A
	No flashover or breakdown .....:	F10 – OK F11 – OK F12 – OK	P
	Making and breaking In at Un .....:	F10 – OK F11 – OK F12 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	F10 – 29 F11 – 30 F12 – 26	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
9.17.1	Limiting value of the line voltage (Ux):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F10 - F11 - F12 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- all values less than 0,85 times the rated voltage (V) .....:	F10 - F11 - F12 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) .....:	F10 - F11 - F12 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .....:	F10 - F11 - F12 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .....:	F10 - F11 - F12 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		--
	RCCB connected according to fig. 4 at the rated voltage (Un) .....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) .....:	F10 - F11 - F12 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) .....:	F10 - F11 - F12 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) .....:	F10 - F11 - F12 -	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 500 A .....:	F10 - F11 - F12 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F10 - F11 - F12 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		--
	- maximum break time (ms) at: $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) .....:	F10 - F11 - F12 -	N/A
	- maximum break time (ms) at: 500 A .....:	F10 - F11 - F12 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s .....:	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s .....:	F10 - F11 - F12 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s .....:	F10 - F11 - F12 -	N/A
	No tripping during tests		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		--
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	F10 – 102 F11 – 94 F12 – 98	P

	TEST SEQUENCE G 3 samples: 230V/240V, 63A, 30mA, 1P+N	**G-1**	**G-2**	**G-3**	
9.22	**Verification of reliability**				
9.22.1	Climatic test based on Clause 4 of IEC 60068-2-3:2000 and IEC 60068-3-4:				--
	- number of cycles: 28	28			P
	- test temperature: upper temperature 55 °C ± 2 °C	55°C			P
	Initial verification:				--
9.9.2.3	- maximum break time at $I_{\Delta n}$ (ms) .....:	G1 – 196 G2 – 196 G3 – 192			P
	No value exceeds the specified limiting value				P
	Additional test for type S:				--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	G1 - G2 - G3 -			N/A
	No tripping during tests				N/A
	Climatic test: no tripping during 28 cycles test .....:	G1 – No tripping G2 – No tripping G3 – No tripping			P
	Final verification: the RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	G1 – 188 G2 – 179 G3 – 183			P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	G1 – 105 G2 – 102 G3 – 102			P

	TEST SEQUENCE G 3 samples: 230V/240V, 16A, 300mA, 1P+N	**G-4**	**G-5**	**G-6**	
9.22	**Verification of reliability**				

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.22.1	Climatic test based on Clause 4 of IEC 60068-2-3:2000 and IEC 60068-3-4:		--
	- number of cycles: 28	28	P
	- test temperature: upper temperature 55 °C ± 2 °C	55°C	P
	Initial verification:		--
9.9.2.3	- maximum break time at $I_{\Delta n}$ (ms) .....:	G4 – 45 G5 – 45 G6 – 47	P
	No value exceeds the specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	G4 - G5 - G6 -	N/A
	No tripping during tests		N/A
	Climatic test: no tripping during 28 cycles test .....:	G4 – No tripping G5 – No tripping G6 – No tripping	P
	Final verification: the RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	G4 – 31 G5 – 35 G6 – 32	P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	G4 – 107 G5 – 95 G6 – 95	P

	TEST SEQUENCE G 3 samples: 400V415V, 63A, 30mA, 3P+N	**G-7**	**G-8**	**G-9**	
9.22	**Verification of reliability**				
9.22.1	Climatic test based on Clause 4 of IEC 60068-2-3:2000 and IEC 60068-3-4:				--
	- number of cycles: 28	28			P
	- test temperature: upper temperature 55 °C ± 2 °C	55°C			P
	Initial verification:				--
9.9.2.3	- maximum break time at $I_{\Delta n}$ (ms) .....:	G7 – 114 G8 – 113 G9 – 115			P
	No value exceeds the specified limiting value				P
	Additional test for type S:				--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	G7 - G8 - G9 -	N/A
	No tripping during tests		N/A
	Climatic test: no tripping during 28 cycles test .....:	G7 – No tripping G8 – No tripping G9 – No tripping	P
	Final verification: the RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	G7 – 107 G8 – 95 G9 – 92	P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	G7 – 94 G8 – 87 G9 – 92	P

	TEST SEQUENCE G 3 samples: 400V415V, 16A, 300mA, 3P+N	**G-10**	**G-11**	**G-12**	
9.22	**Verification of reliability**				
9.22.1	Climatic test based on Clause 4 of IEC 60068-2-3:2000 and IEC 60068-3-4:				--
	- number of cycles: 28	28			P
	- test temperature: upper temperature 55 °C ± 2 °C	55°C			P
	Initial verification:				--
9.9.2.3	- maximum break time at $I_{\Delta n}$ (ms) .....:	G10 – 42 G11 – 42 G12 – 37			P
	No value exceeds the specified limiting value				P
	Additional test for type S:				--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	G10 - G11 - G12 -			N/A
	No tripping during tests				N/A
	Climatic test: no tripping during 28 cycles test .....:	G10 – No tripping G11 – No tripping G12 – No tripping			P
	Final verification: the RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) .....:	G10 – 27 G11 – 34 G12 – 31			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current maximum break time (ms) .....:	G10 – 96 G11 – 102 G12 – 96	P

	TEST SEQUENCE H 3 samples: 400V415V, 63A, 30mA, 3P+N		
IEC 61543:			--
table4-T1.1	**Harmonics, interharmonics**		P
table4-T1.2	**Signalling voltage**		P
table5-T2.3	**Conducted unidirectional transients of the ms and µs time scale**		P
	Test results of test sequence H:		--
	see test report No. :	2506B1062SHA-001	--
	Testing location / address .....:	Intertek Testing Services (Shanghai FTZ) Co., Ltd.	--
		Building No.85&86, 1198 Qinzhou Road (North), Shanghai 200233, China	--

	TEST SEQUENCE I 3 samples: 400V415V, 63A, 30mA, 3P+N		
IEC 61543:			--
table5-T2.1	**Conducted sine-wave voltages or currents**		P
table5-T2.5	**Radiated high-frequency phenomena**		P
table5-T2.2	**Fast transients (burst)**		P
	Test results of test sequence I:		--
	see test report No. :	2506B1062SHA-001	--
	Testing location / address .....:	Intertek Testing Services (Shanghai FTZ) Co., Ltd.	--
		Building No.85&86, 1198 Qinzhou Road (North), Shanghai 200233, China	--

	TEST SEQUENCE J 3 samples: 400V415V, 63A, 30mA, 3P+N		
IEC 61543:			--
table5-T2.6	**Conducted common mode disturbances in the frequency range lower than 150 kHz**		P
table6-T3.1	**Electrostatic discharges**		P
	Test results of test sequence J:		--
	see test report No. :	2506B1062SHA-001	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Testing location / address .....:	Intertek Testing Services (Shanghai FTZ) Co., Ltd.	--
		Building No.85&86, 1198 Qinzhou Road (North), Shanghai 200233, China	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX A (NORMATIVE)

Number of samples to be submitted and test sequences to be applied for verification of conformity for Type F RCCBs
Table A.1 - Test sequences

Test sequence		Clause or subclause acc. to IEC 61008-1	Additional tests acc. to IEC 62423	Test (or inspection)
A_1		6 8.1.1 8.1.2 9.3 8.1.3 9.15 9.4 9.5 9.6 9.13.1 9.13.2, 9.13.3 8.1.3 9.25	6 No No No No No No No No No No No No	Marking General Mechanism Indelibility of marking Clearance and creepage distances (external parts only) Trip free mechanism Reliability of screws, current-carrying parts and connections Reliability of terminals for external conductors Protection against electric shock Resistance to heat Resistance to heat Clearances and creepage distances (internal parts) Resistance to rusting
A_2		9.14	No	Resistance to abnormal heat and to fire
B		9.7.7.4 9.7.7.5 [b)] 9.7.1 9.7.2 9.7.3 9.7.4 9.7.7.2 9.7.5 9.7.6 9.8 9.22.2 9.23	No No No No No No No No No No No No	Resistance of the insulation of open contacts and basic insulation against an impulse voltage in normal conditions Verification of the behaviour of components bridging the basic insulation Resistance to humidity Insulation resistance of the main circuit Dielectric strength of the main circuit Insulation resistance an dielectric strength of auxiliary circuits Verification of clearances with the impulse withstand voltage Secondary circuit of detection transformers Capability of control circuits connected to the main circuits etc. Temperature-rise Reliability at 40°C Ageing of electronic components
C		9.10	No	Mechanical and electrical endurance
D	D_0	9.9 --- ---	No 9.1.2 9.1.3	Residual operating characteristics Verification of the correct operation in case of steady increase of composite residual current Verification of the correct operation in case of sudden appearance of composite residual current
		9.9.3	9.1.7	Type A residual current devices
	D_1	9.17 9.19 --- --- 9.11.2.3 a)b) 9.16 9.12 9.18	No 9.1.5 9.1.6 9.1.4 No No No No	Behaviour in case of failure of the line voltage Unwanted tripping Behaviour in the case of surge currents Behaviour in the case of inrush residual currents Correct operation of RCD powered on two poles only Performance at $I_{\Delta m}$ Test device Resistance to mechanical shock and impact Non-operating current under overcurrent conditions
D_2		9.11.2.3 c)	No	Verification of the suitability of RCCBs for use in IT-systems
E		9.11.2.4 a)	No	Coordination at I_{nc}
		9.11.2.2	No	Performance at I_m
F		9.11.2.4 b)	No	Coordination at I_m
		9.11.2.4 c)	No	Coordination at $I_{\Delta c}$
G		9.22.1	No	Reliability (climatic tests)
H [a)]		IEC 61543 Table 4 -T1.1 IEC 61543 Table 4 -T1.2 IEC 61543 Table 5 -T2.3	No No No	Harmonics, interharmonics Signalling voltage Surges
I		IEC 61543 Table 5 -T2.1 IEC 61543 Table 5 -T2.5 IEC 61543 Table 5 -T2.2	No No No	Conducted sine-wave voltages or currents Radiated electromagnetic field Fast transients (burst)
J		IEC 61543 Table 5 - T2.6 IEC 61543 Table 6 -T3.1	No No	Conducted common mode disturbances in the frequency range lower than 150 kHz Electrostatic discharges

a) For devices containing a continuously operating oscillator, the test of CISPR 14-1 shall be carried out on the samples prior to the tests of this sequence.
b) This test may be done on separate samples.

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX C (NORMATIVE)

Number of samples to be submitted and test sequences to be applied for verification of conformity for Type B RCCBs
Table C.1 - Test sequences

Test sequence		Clause or subclause acc. to IEC 61008-1	Additional tests acc. to IEC 62423	Test (or inspection)
A_1		6 8.1.1 8.1.2 9.3 8.1.3 9.15 9.4 9.5 9.6 9.13.1 9.13.2, 9.13.3 8.1.3 9.25	6 No No No No No No No No 9.2.4 No No No	Marking General Mechanism Indelibility of marking Clearance and creepage distances (external parts only) Trip free mechanism Reliability of screws, current-carrying parts and connections Reliability of terminals for external conductors Protection against electric shock Verification of the RCD after test sequence, Resistance to heat Resistance to heat Clearances and creepage distances (internal parts) Resistance to rusting
A_2		9.14	No	Resistance to abnormal heat and to fire
B		9.7.7.4 9.7.7.5 [b)] 9.7.1 9.7.2 9.7.3 9.7.4 9.7.7.2 9.7.5 9.7.6 9.8 9.22.2 9.23 ---	No No No No No No No No No No No No 9.2.4	Resistance of the insulation of open contacts and basic insulation against an impulse voltage in normal conditions Verification of the behaviour of components bridging the basic insulation Resistance to humidity Insulation resistance of the main circuit Dielectric strength of the main circuit Insulation resistance an dielectric strength of auxiliary circuits Verification of clearances with the impulse withstand voltage Secondary circuit of detection transformers Capability of control circuits connected to the main circuits etc. Temperature-rise Reliability at 40°C Ageing of electronic components Verification of the RCD after test sequence
C		9.10 ---	No 9.2.4	Mechanical and electrical endurance Verification of the RCD after test sequence
D	D_0	9.9 --- --- --- 9.9.3	No 9.1.2 9.1.3 9.2.1.7.1 No	Residual operating characteristics Verification of the correct operation in case of steady increase of composite residual current Verification of the correct operation in case of sudden appearance of composite residual current Verification of the correct operation in case of residual smooth direct current without load for ratings of $I_{\Delta n}$ not tested in D_1 Type A residual current devices
	D_1	9.17 9.19 --- --- --- 9.11.2.3 a)b) 9.16 9.12 9.18 ---	No 9.1.5 9.2.3 9.2.1 9.2.2 No No No No 9.2.4	Behaviour in case of failure of the line voltage Unwanted tripping Behaviour in the case of surge currents Correct operation for RCD powered on two poles only Type B residual current devices Tests at temperature limits Performance at $I_{\Delta m}$ Test device Resistance to mechanical shock and impact Non-operating current under overcurrent conditions Verification of the RCD after test sequence
D_2		9.11.2.3 c)	No	Verification of the suitability of RCCBs for use in IT-systems
E		9.11.2.4 a)	No	Coordination at I_{nc}
		9.11.2.2	No	Performance at I_m
		---	9.2.4	Verification of the RCD after test sequence
F		9.11.2.4 b)	No	Coordination at I_m
		9.11.2.4 c)	No	Coordination at $I_{\Delta c}$
		---	9.2.4	Verification of the RCD after test sequence
G		9.22.1 ---	No 9.2.4	Reliability (climatic tests) Verification of the RCD after test sequence
H [a)]		IEC 61543 Table 4 -T1.1 IEC 61543 Table 4 -T1.2 IEC 61543 Table 5 -T2.3	No No No	Harmonics, interharmonics Signalling voltage Surges
I		IEC 61543 Table 5 -T2.1 IEC 61543 Table 5 -T2.5 IEC 61543 Table 5 -T2.2	No No No	Conducted sine-wave voltages or currents Radiated electromagnetic field Fast transients (burst)
J		IEC 61543 Table 5 - T2.6 IEC 61543 Table 6 -T3.1	No No	Conducted common mode disturbances in the frequency range lower than 150 kHz Electrostatic discharges

a) For devices containing a continuously operating oscillator, the test of CISPR 14-1 shall be carried out on the samples prior to the tests of this sequence.
b) This test may be done on separate samples.

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

Table A.2 - Number of samples for full test procedure			
Test sequence [a]	Number of samples	Minimum number of accepted samples [b]	Maximum number of samples for repeated tests [c]
A_1	1	1	--
A_2	3	2	3
B	3	2	3
C	3	2	3
D	3	2 [d]	3
D_2	3	3	3
E	3	2 [d]	3
F	3	2 [d]	3
G	3	2	3
H [e]	3	2	3
I [e]	3	2	3
J [e]	3	2	3

a) In total a maximum of three test sequences may be repeated.

b) It is assumed that a sample which has not passed a test has not met the requirements due to workmanship or assembly defects which are not representative of the design.

c) In the case of repeated tests, all test results must be acceptable.

d) All samples shall meet the requirements in 9.9.2.1, 9.9.2.2, 9.9.2.3, 9.9.2.4, 9.9.2.5 and 9.11.2.3, as appropriate. In addition, permanent arcing or flashover between poles or between poles and frame shall not occur in any sample during tests of 9.11.2.2, 9.11.2.4 a), 9.11.2.4 b) or 9.11.2.4 c).

e) At the manufacturer's request, the same set of samples may be subjected to more than one of these test sequences.

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

Table A.3 - Number of samples for simplified test procedure			
Test sequence	Number of samples according to the number of poles [a) g)]		
	2-poles [b) c)]	3-poles [d) f) i)]	4-poles [e)]
A_1	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$
A_2	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
B	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
C	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
$D_0 + D_1$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
D_0	1 for all other ratings of $I_{\Delta N}$		
D_2	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
E	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
F	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$
G [j)]	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$
H			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$
I			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$
J			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$

a) If a test is to be repeated according to the minimum performance criteria of clause A.2, a new set of samples is used for the relevant test. In the repeated test all test results must be acceptable.
b) If only 3-pole or 4-pole RCCBs are submitted, this column shall also apply to a set of samples with the smallest number of poles.
c) Also applicable to 1-pole RCCBs with uninterrupted neutral and 2-pole RCCBs with 1 protected pole.
d) Also applicable to 3-pole RCCBs with two protected poles
e) Also applicable to 3-pole RCCBs with uninterrupted neutral and 4-pole RCCBs with 3 protected poles.
f) This column is omitted when 4-pole RCCBs have been tested.
g) If only one value of $I_{\Delta N}$ is submitted, min. rating $I_{\Delta N}$ and max. rating $I_{\Delta N}$ are replaced by $I_{\Delta N}$.
h) Only the highest number of current paths.
i) If a 3-pole RCCB with 4 current paths and a 4-pole RCCB are submitted, then only the 4-pole RCCB is tested, with exception of the test of 9.8 of test sequence B for which both types are submitted to the test.
j) If the requirements t test max. rating I_N and minimum rating $I_{\Delta N}$ does not cover all the possible range of RCBOs, the minimum $I_{\Delta N}$ shall in any case be chosen for the test

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

Table A.4 - Test sequences for RCCBs of different classification according to 4.6			
Test sequence	Number of samples according to the number of poles [a]		
	2-pole [b] [c]	3-pole [e]	4-pole [d]
$D_0 + D_1$	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$
D_0	1 for all other ratings of $I_{\Delta N}$ with max. $I_{\Delta N}$		

a) If a test is to be repeated according to the minimum performance criteria of clause A.2, a new set of samples is used for the relevant test. In the repeated test all test results must be acceptable.

b) If only 3-pole or 4-pole RCCBs are submitted, this column shall also apply to a set of samples with the smallest number of poles.

c) Also applicable to 1-pole RCCBs with uninterrupted neutral.

d) Also applicable to 3-pole RCCBs with uninterrupted neutral.

e) This column is omitted when 4-pole RCCBs are being tested.

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX B **DETERMINATION OF CLEARANCES AND CREEPAGE DISTANCES**	--
B.1	General	--
	In determining clearances and creepage distances, it is recommended that the following points should be considered.	P
B.2	Orientation and location of a creepage distance	--
	If necessary, the manufacturer shall indicate the intended orientation of the equipment or component in order that creepage distances are not adversely affected by the accumulation of pollution for which they were not designed.	P
B.3	Creepage distances where more than one material is used	--
	A creepage distance may be split in several portions of different materials and/or have different pollution degrees if one of the creepage distances is dimensioned to withstand the total voltage or if the total distance is dimensioned according to the material having the lowest CTI.	P
B.4	Creepage distances split by floating conductive part	--
	A creepage distance may be split into several parts, made with insulation material having the same CTI, including or separated by floating conductors as long as the sum of the distances across each individual part is equal or greater than the creepage distance required if the floating part did not exist. The minimum distance X for each individual part of the creepage distance is given in IEC 60664-1:2007, 6.2 (see also Example 11 in Figure B.1).	P
B.5	Measurement of creepage distances and clearances	--
	In determining creepage distances according to IEC 60664-1, the dimension *X*, specified in the following examples, has a minimum value of 1,0 mm for pollution degree 2.	P
	If the associated clearance is less than 3 mm, the minimum dimension *X* may be reduced to one third of this clearance.	P
	The methods of measuring creepage distances and clearances are indicated in Example 1 to 11. These cases do not differentiate between gaps and grooves or between types of insulation.	P
	The following assumptions are made:	--
	- any recess is assumed to be bridged with an insulating link having a length equal to the specified width *X* and being placed in the most unfavourable position (see Example 3);	P
	- where the distance across a groove is equal to or larger than the specified width *X*, the creepage distance is measured along the contours of the groove (see Example 3);	P
	- creepage distances and clearances measured between parts which can assume different positions in relation to each other, are measured when these parts are in their most unfavourable position.	P

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX C **ARRANGEMENT FOR THE DETECTION OF THE EMISSION OF IONIZED GASES DURING SHORT-CIRCUIT TESTS**	
	The device under test is mounted as shown in figure C.1, which may require adapting to the specific design of the device, and in accordance with the manufacturer's instructions.	P
	When required (i.e. during "O" operations), a clear polyethylene sheet (0,05 ± 0,01) mm thick, of a size at least 50 mm larger, in each direction, than the overall dimensions of the front face of the device but not less than 200 mm × 200 mm, is fixed and reasonably stretched in a frame, placed at a distance of 10 mm from	P
	– either the maximum projection of the operating means of a device without recess for the operating means;	P
	– or the rim of a recess for the operating means of a device with recess for the operating means.	P
	The sheet should have the following physical properties: Density at 23 °C: 0,92 ± 0,05 g/cm³ Melting-point: 110 °C – 120 °C.	P
	When required, a barrier of insulating material, at least 2 mm thick, is placed, as shown in figure C.1, between the arc vent and the polyethylene sheet to prevent damage of the sheet due to hot particles emitted from the arc vent.	P
	When required, a grid (or grids) according to figure C.2 is (are) placed at a distance of "a" mm from each arc vent side of the device.	P
	The grid circuit (see figure C.3) shall be connected to the points B and C (see figures 7 or 8, as applicable).	P
	The parameters for the grid circuit are as follows:	P
	Resistor R': 1,5 Ω	P
	Copper wire F': length 50 mm, and diameter in accordance with 9.11.2.1 f 1).	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX D ROUTINE TESTS		--
D.1	General		--
	The tests specified in this standard are intended to reveal, as far as safety is concerned, unacceptable variations in material or manufacture.		N/A
	In general, further tests have to be made to ensure that every RCCB conforms with the samples that withstood the tests of this standard, according to the experience gained by the manufacturer.		N/A
D.2	Tripping test		--
	A residual current is passed through each pole of the RCCB in turn. The RCCB shall not trip at a current less than or equal to 0,5 $I_{\Delta N}$, but it shall trip at $I_{\Delta N}$ within a specified time (ms) (see Table 1).		N/A
		D1 - D2 - D3 -	N/A
	The test current shall be applied at least five times to each RCCB and shall be applied at least twice to each pole.		N/A
D.3	Electric strength test		--
	A voltage of substantially sine-wave form of 1 500 V having a frequency of 50 Hz/60 Hz is applied for 1 s as follows:		N/A
	a) with the RCCB in the open position, between each pair of terminals which are electrically connected together when the RCCB is in closed position	D1 - D2 - D3 -	N/A
	b) for RCCBs not incorporating electronic components, with the RCCB in the closed position, between each pole in turn and the others connected together	D1 - D2 - D3 -	N/A
	c) for RCCBs incorporating electronic components, with the RCCB in the open position, either between all incoming terminals of poles in turn or between all outgoing terminals of poles in turn, depending on the position of the electronic components.	D1 - D2 - D3 -	N/A
	No flashover or breakdown shall occur		N/A
D.4	Performance of the test device		--
	With the RCCB in the closed position, and connected to a supply at the appropriate voltage, the test device, when operated, shall open the RCCB.		N/A
	Where the test device is intended to operate at more than one value of rated voltage, the test shall be made at the lowest value of rated voltage.		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX E ROUTINE TESTS FOR TYPE F AND B RCCBS		--
E.1	**Tripping test**		--
	An alternating residual current is passed through each pole of the Type F or Type B RCCB or the Type F or Type B RCBO, as applicable, in turn. The RCCB or the RCBO, as applicable, shall not trip at a current less than or equal to 0,5 $I_{\Delta n}$, but it shall trip at $I_{\Delta n}$ within a specified time (see Table 1 of IEC 61008-1 or Table 2 of IEC 61009-1, as applicable).		N/A
	The test current shall be applied at least five times on each sample and shall be applied at least twice on each pole.		N/A
	A residual smooth direct current is passed through one pole. The Type B RCCB or the Type B RCBO, as applicable, shall not trip at a current less than or equal to 0,5 $I_{\Delta n}$, but it shall trip at 2 $I_{\Delta n}$ within a specified time (see Table 1 of this standard).		N/A
	The test current shall be applied at least twice on each sample.		N/A
E.2	**Electric strength test**		--
	Clause D.2 of IEC 61008-1 or IEC 61009-1 applies as applicable.		N/A
E.3	**Performance of the test device**		--
	Clause D.3 of IEC 61008-1 or IEC 61009-1 applies as applicable.		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

J	**ANNEX J** **Particular requirements for RCCBs with screwless type terminals for external copper conductors**		
J.1	**THIS ANNEX APPLIES TO RCCBS WITHIN THE SCOPE OF CLAUSE 1, EQUIPPED WITH SCREWLESS TERMINALS, FOR CURRENT NOT EXCEEDING 20 A PRIMARILY SUITABLE FOR CONNECTING UNPREPARED (SEE J.3.6) COPPER CONDUCTORS OF CROSS-SECTION UP TO 4 MM².**		--
J.6	Marking and other product information		--
	in addition to clause 6:		N/A
	universal terminals:		N/A
	no markings		N/A
	non-universal terminals:		N/A
	terminals for rigid-solid conductors marked by “sol”		N/A
	terminals for rigid (solid and stranded) conductors marked by “r”		N/A
	terminals for flexible conductors marked by “f”		N/A
	Marking on the RCCB or		N/A
	if the space available is not sufficient on the smallest package unit or in technical information		N/A
	Marking indicating the length of insulation to be removed before insertion of the conductor into the terminal shown on the RCBO		N/A
	Manufacturer shall provide information in his literature, on the maximum number of conductors which may be clamped.		N/A
J.8	Standard conditions for operating in service and for installation		--
	clause 8 applies with the following modifications: in 8.1.5, only 8.1.5.1, 8.1.5.2, 8.1.5.3, 8.1.5.6 and 8.1.5.7 apply		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2 of this annex, instead of 9.4 and 9.5.		N/A
J.8.1	Connection or disconnection of conductors		N/A
	The connection or disconnection of conductors shall be made:		N/A
	- by the use of a general purpose tool or by a convenient device integral with the terminal to open it and to assist the insertion or the withdrawal of the conductors (e.g. for universal terminals)		N/A
	- or, for rigid conductors by simple insertion. For the disconnection of the conductors an operation other than a pull on the conductor shall be necessary (e.g. for push-wire terminals).		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Universal terminals shall accept rigid (solid or stranded) and flexible unprepared conductors.		N/A
	Non-universal terminals shall accept the types of conductors declared by the manufacturer.		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2.		N/A
J.8.2	Dimensions of connectable conductors		--
	The dimensions of connectable conductors are given in Table J.1.		N/A
	The ability to connect these conductors shall be checked by inspection and by the tests of J.9.1 and J.9.2.		N/A
J.8.3	Connectable cross-sectional areas		--
	nominal cross-sections to be clamped acc. table J.2		N/A
	compliance checked by inspection and tests of J.9.1 and J.9.2.		N/A
J.8.5	Design and construction of terminals		--
	terminals so designed and constructed that:		--
	- each conductor clamped individually		N/A
	- during operation of connection or disconnection the conductors can be connected or disconnected either at the same time or separately		N/A
	- inadequate insertion of the conductor is avoided		N/A
	It shall be possible to clamp securely any number of conductors up to the maximum provided for		N/A
	compliance checked by inspection and tests of J.9.1 and J.9.2.		N/A
J.8.6	Resistance to ageing		--
	compliance checked by the test of J.9.3.		N/A
J.9	Tests		--
	Clause 9 applies, by replacing 9.4 and 9.5 by the following tests		N/A
J.9.1	Test of reliability of screwless terminals		--
J.9.1.1	Reliability of screwless system		N/A
	three terminals of poles of new samples, with copper conductors of the rated cross sectional area in accordance with Table J.2, types of conductors in accordance with J.8.1.		N/A
	The connection and subsequent disconnection shall be made five times with:		N/A
	Min. cross-section (mm²) ..... :	mm²	N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Max. cross-section (mm²) ..... :	mm²	N/A
	new conductors used each time, except for the fifth time, when the conductor used for the fourth insertion is clamped at the same place. Before insertion into the terminal, wires of stranded rigid conductors re-shaped and wires of flexible conductors twisted to consolidate the ends.		N/A
	After each insertion, the conductor being inserted rotated 90 ° along its axis at the level of the clamped section and subsequently disconnected.		N/A
	After tests, the terminal not damaged in such a way as to impair its further use.		N/A
J.9.1.2	Test of reliability of connection		--
	three terminals of poles of new samples, with copper conductors of the rated cross sectional area in accordance with Table J.2, types of conductors in accordance with J.8.1.		N/A
	Before insertion into the terminal, wires of stranded rigid conductors and flexible conductors reshaped and wires of flexible conductors twisted to consolidate the ends.		N/A
	possible to fit the conductor into the terminal without undue force in the case of universal terminals and with the force necessary by hand in the case of push-wire terminals.		N/A
	conductor pushed as far as possible into the terminal or inserted so that adequate connection is obvious.		N/A
	Min. cross-section (mm²) ..... :	mm²	N/A
	Max. cross-section (mm²) ..... :	mm²	N/A
	After the test, no wire of the conductor shall have escaped outside the terminal.		N/A
J.9.2	Tests of reliability of terminals for external conductors: mechanical strength		N/A
	three terminals of poles of new samples fitted with new conductors of the type and of the minimum and maximum cross-sectional areas acc. Table J.2.		N/A
	Min. cross-section (mm²) ..... :	mm²	N/A
	Max. cross-section (mm²) ..... :	mm²	N/A
	wires of stranded rigid conductors and flexible conductors reshaped and wires of flexible conductors twisted to consolidate the ends.		N/A
	Pull for 1 min, min. cross-section (N)..... :	N	N/A
	Pull for 1 min, max. cross-section (N)..... :	N	N/A
	During the test no noticeable move of conductor		N/A

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Clause	Requirement + Test	Result - Remark			Verdict
J.9.3	Cycling test				--
	Universal, rigid conductors - 3 samples Universal, flexible conductors - 3 samples				N/A
	Non-universal, solid conductors - 3 samples				N/A
	Non-universal, rigid (solid) stranded conductors - 3 samples Non-universal, rigid (stranded) stranded conductors - 3 samples				N/A
	Non-universal, flexible conductors - 3 samples				N/A
	Cross-section (mm²) ..... :	mm²			N/A
	Test current I_N (A).....:	A			N/A
	samples subjected to 192 temperature cycles				N/A
	Voltage drop after 192 cycles:				--
	voltage drop, measured at each terminal, at the end of the 192nd cycle, exceeded not the smaller of the two following values:				N/A
	– 22,5 mV				N/A
	– 1,5 times the value measured after the 24th cycle				N/A
		sample 1	sample 2	sample 3	--
		[mV]	[mV]	[mV]	--
	- rigid solid conductors .....:				N/A
	- rigid stranded conductors .....:				N/A
	- flexible conductors .....:				N/A
	Voltage drop after 24th cycle:				--
		sample 1	sample 2	sample 3	--
		[mV]	[mV]	[mV]	--
	- rigid solid conductors .....:				N/A
	- rigid stranded conductors .....:				N/A
	- flexible conductors .....:				N/A
	after this test: no changes evidently impairing further use, such as cracks, deformations or the like.				N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

K	**ANNEX K Particular requirements for RCCBs with flat quick-connect terminations**				
K.1	**This annex applies to RCCBs within the scope of Clause 1, equipped with flat quick-connect terminations consisting of a male tab (see K.3.2) with nominal width 6,3 mm and thickness0,8 mm, to be used with a mating female connector for connecting electrical copper conductors according to the manufacturer's instructions, for rated currents up to and including 16 A.**				--
K.6	Marking and other product information				--
	in addition to clause 6, addition after the lettered item k):				--
	Information regarding the female connector acc. to IEC 61210 and type of conductor to be used shall be given in the manufacturers' instructions:				N/A
	l) manufacturer´s name or trade mark				N/A
	m) type reference				N/A
	n) information on cross-sections of conductors and colour code of insulated female connectors (see Table K.1)				N/A
	o) the use of only silver or tin-plated copper alloys				N/A
K.8	Requirements for construction and operation				--
	Clause 8 applies, with the following exceptions:				N/A
	subclause 8.1.3 applies, the female connectors being fitted to the male tabs of the RCCB				N/A
	replace the contents of 8.1.5 by the following:				N/A
K.8.2	Terminals for external conductors				N/A
K.8.2.1	Male tabs and female connectors shall be of a metal having mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use.				N/A
K.8.2.2	The nominal width of the male tab is 6,3 mm and the thickness 0,8 mm, applicable to rated currents up to and including 16 A. NOTE 1:The use for rated currents up to and including 20 A is accepted in BE, FR, IT, PT, ES and US				N/A
	The dimensions of the male tab shall comply with those specified in Table K.3 and in figures K.2, K.3, K.4 and K.5				N/A
		Dimensions of tabs according Table K.3		Measured in mm	--
		Minimum [mm]	Maximum [mm]		--
A	Dimple	0,7	1,0		N/A
	Hole	0,5	1,0		N/A
B	Dimple	7,8 min			N/A

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Clause	Requirement + Test			Result - Remark			Verdict
	Hole	7,8 min					N/A
C	Dimple	0,77	0,84				N/A
	Hole	0,77	0,84				N/A
D	Dimple	6,20	6,40				N/A
	Hole	6,20	6,40				N/A
E	Dimple	3,6	4,1				N/A
	Hole	4,3	4,7				N/A
F	Dimple	1,6	2,0				N/A
	Hole	1,6	2,0				N/A
J	Dimple	8°	12°				N/A
	Hole	8°	12°				N/A
M	Dimple	2,2	2,5				N/A
	Hole	---	---				---
N	Dimple	1,8	2,0				N/A
	Hole	---	---				---
P	Dimple	0,7	1,8				N/A
	Hole	0,7	1,8				N/A
Q	Dimple	8,9 min	---				N/A
	Hole	8,9 min	---				N/A
	Dimensions of the female connector which may be fitted-on are given in Figure K.6 and in Table K.4.						N/A
				--	request acc. table K.3	measured value	--
				B_3 max	7,8mm		N/A
				L_2 max	3,5mm		N/A
K.9	Tests						--
	clause 9 applies with the following modifications:						N/A
	replace the contents of 9.5 by the following text:						N/A
K.9.1	Mechanical overload-force						--
	Test done on 10 terminals of RCCBs, mounted as in normal use when wiring takes place.						N/A
	Axial push force, and successively the axial pull force gradually applied to the male tab integrated in the RCCB						N/A
	Push 96N						N/A
	Pull 88N						N/A
	No damage occurred to the tab or to the RCCB in which the tab is integrated.						N/A
	addition to 9.8.3:						N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fine -wire thermocouples shall be placed in such a way as not to influence the contact or the connection area. An example of placement is shown in fig K.1		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

L	**ANNEX L** **Specific requirements for RCCBs with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors**		
L.6	Marking and other product information		--
	In addition to clause 6 the following apply:		N/A
	Terminal marking according table L.1, on the RCCB, near the terminals		N/A
	Conductor types accepted:		N/A
	Copper only	☐ None	N/A
	Aluminium only	☐ “Al”	N/A
	Aluminium and copper	☐ “Al/Cu”	N/A
	Other information concerning the number of conductors, screw torque (if different from table 10) and cross-section shall be indicated on the RCCB	Nm mm²	N/A
L.7	Standard conditions for operation in service		--
	Clause 7 applies		N/A
L.8	Constructional requirements		--
	Clause 8 applies with the following exceptions:		N/A
8.1.5.2	add the following text at the end of 8.1.5.2:		N/A
	For connection of aluminium conductors, RCCBs shall be provided with screw-type terminals allowing the connection of conductors having nominal cross-sections as shown in table L.2		N/A
	Terminals for the connection of aluminium conductors and terminals of aluminium for the connection of copper or aluminium conductors shall have mechanical strength adequate to withstand the tests of 9.4, with the test conductors tightened with the torque indicated in table 11, or with the torque specified by the manufacturer, which shall never be lower than that specified in table 11.		N/A
	Compliance is checked by inspection, by measurement and by fitting in turn one conductor of the smallest and one of the largest cross-section areas as specified		N/A
8.1.5.4	replace the text of 8.1.5.4 by the following:		--
	Terminals shall allow the conductors to be connected without special preparation		N/A
	Compliance is checked by inspection and by the tests of L.9		N/A
L.9	Tests		--

IEC 62423				
Clause	Requirement + Test	Result - Remark		Verdict
	Clause 9 applies with the following modifications/additions:			N/A
	For the tests which are influenced by the material of the terminal and the type of conductor that can be connected, the test conditions of table L.3 are applied			N/A
	Additionally the test of L.9.2 is carried out on terminals separated from the RCCB			N/A
L.9.2	Current cycling test			--
	This test is carried out on separate terminals			N/A
L.9.2.3	Test arrangement			--
	The general arrangement of the samples shall be as shown in figure L.1			N/A
	90 % of torque stated by the manufacturer or selected in table 10 used for the specimens	torque: Nm		N/A
	The test is carried out with conductors according to table L.5. The length of the test conductor from the point of entry to the screw-type terminal specimens to the equalizer shall be as in table L.6	cross-section: mm^2 minimum conductor length: mm		N/A
	Cross section of equalizer not greater than that given in table L.7	max. cross-section: mm^2		N/A
L.9.2.5	Test method and acceptance criteria			--
	Test loop subjected to 500 cycles of 1h current-on and 1h current-off, starting at an a.c. current value of 1,12 times the test current value determined in table L.8	test current: A		N/A
	Near the end of each current-on period of the first 24 cycles, the current shall subsequently be adjusted to raise the temperature of the reference conductor to 75°C			N/A
	At the end of the 25^{th} cycle the test current shall be adjusted the last time and the stable temperature shall be recorded as the first measurement. No further adjustment of test current for the remainder of the test			N/A
	Temperatures recorded for at least one cycle of each working day, and after approximately 25, 50, 75, 100, 125, 175, 225, 275, 350, 425 and 500 cycles			N/A
	For each screw-type terminal:			N/A
	- the temperature rise shall not exceed 110 K			N/A
	- the stability factor Sf shall not exceed ± 10 °C			N/A
	ambient air temperature: °C			N/A
		max. temperature rise [K]	max. stability factor Sf [°C]	--
	Terminal 1			N/A

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Clause	Requirement + Test	Result - Remark		Verdict
	Terminal 2			N/A
	Terminal 3			N/A
	Terminal 4			N/A
	Terminal 5			N/A
	Terminal 6			N/A
	Terminal 7			N/A
	Terminal 8			N/A

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Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62423
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Type F and type B residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)

Differences according to ..... :	EN 62423:2012 + A11:2021 + A12:2022 used in conjunction with EN 61008-1:2012+A1:2014+A2:2014+A11:2015 +A12:2017, EN 61008-2-1:1994 + A11:1998
TRF template used..... :	IECEE OD-2020-F2:2022, Ed. 1.2
Attachment Form No. ..... :	EU_GD_IEC62423E_II
Attachment Originator..... :	IMQ S.p.A.
Master Attachment..... :	Dated 2023-06-09

	CENELEC COMMON MODIFICATIONS (EN)			--
	GENERAL			--
9.11	Short circuit tests			--
9.11.2.1 d)	Value of power frequency recovery voltage shall be equal to 110% of the rated voltage			--
9.11.2.1 b)	Tolerances and test quantities			--
	voltage (including recovery voltage): 0, -5%			--
replace:	**TEST SEQUENCE "A_1"** *replace clause 6 by* 2 samples: 230V/240V, 63A, 30mA, 1P+N 400V415V, 63A, 30mA, 3P+N	**A_1-1**	**A_1-2**	--
6	**MARKING**			--
6.Z1	standard marking			--
	Each RCCB shall be marked in a durable manner according to the following Table Z3.			P
	RCCB MARKED WITH:			--
a)	The manufacturer's name or trademark	HONI®		P
b)	Type designation, catalogue number or serial number	HB202B	HB204B	P
c)	Rated voltage(s) with the symbol ~	230V/240V~	400V/415V~	P
d)	Rated frequency, if the RCCB is designed for frequencies other than 50Hz	50/60Hz		P
e)	rated current	63A		P
f)	Rated residual operating current ($I_{\Delta n}$) in A or in mA	30mA		P

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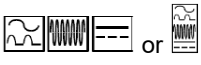
Clause	Requirement + Test	Result - Remark	Verdict
h) *)	Rated making and breaking capacity (I_m)	1000A	P
j)	The degree of protection (only if different from IP20)		N/A
k)	The position of use, if necessary		N/A
l) *)	Rated residual making and breaking capacity ($I_{\Delta m}$), if different from rated short-circuit capacity (I_m)	1000A	P
m)	The symbol S (S in a square) for type S devices		N/A
n)	symbol of the method of operation according to Table Z1 of 4.1 if the RCCB is functionally dependent on the line voltage	Independent of line voltage for Type A part	N/A
o)	Operating means of the test device, by the letter T (It is recommended to advise the user to test the device regularly)	T	P
p)	Wiring diagram unless the correct mode of operation is evident		P
r)	Operating characteristic in presence of residual currents with d.c. components		--
	- RCBOs of type B with the symbol 		P
	- RCBOs of type F with the symbol 		N/A
s)	RCCBs according to 4 Z2 marked with the symbol (snowflake enclosing -25)		P
t)	Indication of the terminal for the neutral with "N"	N	P
u)	Additional marking of performance to other standards or additional requirements according to 6.Z2		P
	*) $I_{\Delta M}$ and I_m (if different of $I_{\Delta M}$) may be anywhere on the device or in the catalogue but shall be together.		P
	If a degree of protection higher than IP20 is marked on the device, it shall comply with it, whichever the method of installation. If the higher degree of protection is obtained only by a specific method of installation and/or with the use of specific accessories this shall be specified in the manufacturers literature		N/A
	The manufacturer shall state the Joule integral I^2t and the peak current I_p withstand capability of the RCCB. Where this are not stated, minimum values as given in table 15 apply.		P
	RCCB classified acc. 4.1.2.1: Time delay when opening in case of failure of the line voltage (s) :		N/A
	RCCB´s other than operated by means of push button, open position indicated by "0" and closed position by "|"	O OFF / I ON	P
	Additional national symbols are allowed Provisionally the use of national indications only is allowed These indication visible when RCCB is installed		P

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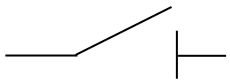
Clause	Requirement + Test	Result - Remark	Verdict
	For push-buttons the OFF push-button shall either be red and/or marked with "O"		N/A
	RED shall not be uses for any other push-button		N/A
	If a push-button is used for closing the contacts and is evidently identified as such, its depressed position is sufficient to indicate the closed position.		N/A
	If a single push-button is used for closing and opening the contacts and is identified as such, the button remaining in its depressed position is sufficient to indicate the closed position. On the other hand, if the button does not remain depressed, an additional means indicating the position of the contacts shall be provided.		N/A
	If necessary to distinguish between supply and load terminals they shall be clearly marked	“1, 2, N” (1P+N) “1, 3, 5”, “2, 4, 6”, “N” (3P+N)	P
	Terminals for neutral circuit N		P
	Terminal for protective conductor		N/A
	The suitability for isolation, which is provided by all RCCBs of this standard, may be indicated by the symbol on the device		P
	The base for plug-in RCCBs shall be marked with the following:		--
	- rated current or maximum rated current		N/A
	- trade mark		N/A
	Marking indelible, easy legible and not on removable parts		P
	Labels not easy to remove and no curling. Test acc. to cl. 9.3: 15 s with water and 15 s with hexane		P
	For universal terminals (rigid-solid, rigid-stranded and flexible conductors:		--
	- no markings		N/A
	For non-universal terminals:		--
	- terminals for rigid-solid conductors only, marked by the letters “s” or “sol”		N/A
	- terminals for rigid (solid and stranded) conductors only, marked by the letter “r”		N/A
	marking on the RCCB or if the space available is not sufficient, on the smallest package unit or in technical information		N/A
6.Z2	**additional marking**		--
	Additional marking to other standards (EN or IEC or other) or additional requirements are allowed under the following conditions:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- The RCCB shall comply with all the requirements of the additional standard.	IEC 61008-1 IEC 62423	P
	- The relevant standards to which the additional marking refers shall be indicated adjacent to this marking and shall be clearly differentiated or separated from the standard marking according to 6.Z.1.		P
	Compliance is checked by inspection and by carrying out all the test sequences required by the relevant standard. Equivalent or less severe test sequences need not be repeated.		P
8.	**Requirements for construction and operation**		--
8.1	MECHANICAL DESIGN		--
8.1.1	General		--
modify	Not possible to alter the operating characteristics by means of external interventions		P
8.1.2	Mechanism		--
	The means of indication of the contact position shall be reliable (Compliance is checked by inspection and by the test of 9.9 and 9.15		P
delete	~~For RCCBs functionally dependent on line voltage, reclosing automatically when the line voltage is restored after failure, the operating means shall remain in the ON position and the contacts shall reclose automatically unless the operating means has been placed in the OFF position~~		
9.4 *add*	Plug-in connections are tested by plugging the RCCB in and pulling it out five times.		N/A
	After the test the connection shall not have become loose nor shall their electrical function be impaired.		N/A
8.1.5	Terminals for external conductors		--
8.1.5.1	Terminals ensure the necessary contact pressure		--
modify	In this standard, only terminals for copper conductors are considered		P
	Compliance is checked by inspection and by the tests as relevant for the type of connection:		P
	9.5 for screw-type terminals		P
	by specific tests for plug-in or bolt-on RCCBs included in the standard		N/A
	by the tests of Annexes Jor K		N/A
8.1.5.2 *delete*	~~or terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors according to Annex L.~~		--
8.1.Z1	Non-interchangeability		--

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Clause	Requirement + Test	Result - Remark	Verdict
add			
	For RCCBs intended to be mounted on bases forming a unit therewith (plug-in type or screw-in type) it shall not be possible, without the aid of a tool, to replace a RCCB when mounted and wired as for normal use by another of the same make having a higher rated current. Compliance is checked by inspection.		N/A
8.1.Z2 *add*	Mechanical mounting of plug-in type RCCBs		--
	The mechanical mounting of plug-in type RCCBs, the holding in position of which does not depend solely on their plug-in connection(s), shall be reliable and have adequate stability.		N/A
8.1.Z2.1 *add*	Plug-in type RCCBs, the holding in position of which does not depend solely on their plug-in connection(s)		N/A
8.1.Z2.2 *add*	Plug-in type RCCBs, the holding in position of which depends solely on their plug-in connection(s)		N/A
	Compliance of the mechanical mounting is checked by the relevant tests of 9.12.		N/A

	TEST SEQUENCE A_2 3 samples: 230V/240V, 63A, 30mA, 1P+N 3 samples: 400V415V, 63A, 30mA, 3P+N	**A_2-1~A_2-3** **A_2-4~A_2-6**	
9.14	GLOW-WIRE TEST		
add	Small parts, where each surface lies completely within a circle of 15 mm diameter, or where any part of the surface lies outside a 15 mm diameter circle and it is not possible to fit a circle of 8 mm diameter on any of the surfaces, are not subjected to the test of this subclause (see Figure Z7 for diagrammatic representation).		P

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE B 3+1 samples: 230V/240V, 63A, 30mA, 1P+N	**B-1~ B-4**			--
8	requirements for construction and operation				--
8.3	DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY				--
	RCCBs have adequate dielectric properties				P
9.7 *MODIFY*	TEST OF DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY				
9.7.7.4.1 *MODIFY*	rated impulse withstand voltage [kV]:	4kV			
	see level of test laboratory [m]	5			
	test voltage (acc. Table 22, *modified*) [kV]:	6,2			
9.7.7.4.3 *MODIFY*	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (~~or path~~) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any				
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (~~or path~~) of the RCCB				
9.7.2 *modify*	Insulation resistance of the main circuit measured between 30 and 60 min after this treatment with 500 V DC after 5 s:	B1 [MΩ]	B2 [MΩ]	B3 [MΩ]	
	a) between the terminals which are electrically connected together when the RCCB is in the closed position..... ≥ 2 MΩ	>500	>500	>500	P
	b) between each pole and the others connected together (electronic components, connected between poles being disconnected)..... ≥ 2 MΩ	>500	>500	>500	P
	c) with the RCCB in the closed position, between all poles connected together and the frame, including a metal foil in contact with the outer surface of the housing of insulation material but with the terminal area kept free..... ≥ 5 MΩ	>500	>500	>500	P
	d) between the frame and a metal foil in contact with the inner surface of the lining of insulating material ..... ≥ 5 MΩ				N/A
9.7.3 *modify*	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:				--
	a) .....2000 V	OK	OK	OK	P
	b) (electronic components, connected between poles being disconnected).....2000 V	OK	OK	OK	P
	c) .....2000 V	OK	OK	OK	P
	d) .....2500 V				N/A
	No flashover or breakdown				P

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Clause	Requirement + Test	Result - Remark	Verdict
9.7.7.2 *modify*	delete in table 16 the line beginning with “2,5” rated impulse withstand voltage [kV]:	4kV	N/A
	see level of test laboratory [m]		N/A
	test voltage (acc. Table 16) [kV]:		N/A
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole ~~(or path)~~ connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		N/A
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole ~~(or path)~~ of the RCCB		N/A
9.23 *MODIFY*	**Verification of ageing**		--

	TEST SEQUENCE B 3+1 samples: 400V415V, 63A, 30mA, 3P+N	**B5 ~ B8**			--
8	**requirements for construction and operation**				--
8.3	DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY				--
	RCCBs have adequate dielectric properties				P
9.7 *MODIFY*	TEST OF DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY				--
9.7.7.4.1 *MODIFY*	rated impulse withstand voltage [kV]:	4kV			--
	see level of test laboratory [m]	5			--
	test voltage (acc. Table 22, *modified*) [kV]:	6,2			--
9.7.7.4.3 *MODIFY*	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (~~or path~~) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any				
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (~~or path~~) of the RCCB				
9.7.2 *modify*	Insulation resistance of the main circuit measured between 30 and 60 min after this treatment with 500 V DC after 5 s:	B5 [MΩ]	B6 [MΩ]	B7 [MΩ]	--
	a) between the terminals which are electrically connected together when the RCCB is in the closed position ..... ≥ 2 MΩ	>500	>500	>500	P
	b) between each pole and the others connected together (electronic components, connected	>500	>500	>500	P

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Clause	Requirement + Test	Result - Remark			Verdict
	between poles being disconnected) ..... ≥ 2 MΩ				
	c) with the RCCB in the closed position, between all poles connected together and the frame, including a metal foil in contact with the outer surface of the housing of insulation material but with the terminal area kept free ..... ≥ 5 MΩ	>500	>500	>500	P
	d) between the frame and a metal foil in contact with the inner surface of the lining of insulating material ..... ≥ 5 MΩ				N/A
9.7.3 *modify*	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:				--
	a) .....2000 V	OK	OK	OK	P
	b) (electronic components, connected between poles being disconnected) .....2000 V	OK	OK	OK	P
	c).....2000 V	OK	OK	OK	P
	d) .....2500 V				N/A
	No flashover or breakdown				P
9.7.7.2 *modify*	delete in table 16 the line beginning with “2,5” rated impulse withstand voltage [kV]:	4kV			N/A
	see level of test laboratory [m]				N/A
	test voltage (acc. Table 16) [kV]:				N/A
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole ~~(or path)~~ connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any				N/A
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole ~~(or path)~~ of the RCCB				N/A
9.23 *MODIFY*	**Verification of ageing**				--

	TEST SEQUENCE C 3 samples: 230V/240V, 63A, 30mA, 1P+N	**C-1**	**C-2**	**C-3**	--
	TESTS C_1				--
8	requirements for construction and operation				--
8.6	**Mechanical and electrical endurance**				--
	RCCBs shall be capable of performing an adequate number of mechanical and electrical operations.				P
9.10.3 modify:	After test:				--
	a)	C1 – OK			P

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
		C2 – OK C3 – OK	
	b)	C1 – OK C2 – OK C3 – OK	P
	c)	C1 – OK C2 – OK C3 – OK	P
	d)	C1 - C2 - C3 -	N/A

	TEST SEQUENCE C 3 samples: 400V/415V, 63A, 30mA, 3P+N	**C-4**	**C-5**	**C-6**	--
	TESTS C_1				--
8	requirements for construction and operation				--
8.6	**Mechanical and electrical endurance**				--
	RCCBs shall be capable of performing an adequate number of mechanical and electrical operations.				P
9.10.3 modify:	After test:				--
	a)	C4 – OK C5 – OK C6 – OK			P
	b)	C4 – OK C5 – OK C6 – OK			P
	c)	C4 – OK C5 – OK C6 – OK			P
	d)	C4 - C5 - C6 -			N/A

	TEST SEQUENCE D 3 samples: 230V/240V, 63A, 30mA, 1P+N	**D-1**	**D-2**	**D-3**	--

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	TEST D_0		--
9.9.1 *delete:*	~~For multiple settings of $I_{\Delta N}$ tests are made for each setting~~		--
9.1.7 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** **(For Type B this test is replaced by the test of 9.2.1.4.)** Verification of the correct operation in case of residual pulsating direct currents in presence of a standing smooth direct current of 0,01 A		--
	Test acc. 9.21.1.4 but the smooth direct current of 0,006 A replaced by 0,01 A		N/A
	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,01 A:		--
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)	30mA	N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 10 mA) ..... :	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
	TEST D_1		--
8	Requirements for construction and operation		--
8.12	RCCBs functionally dependent on line voltage		--
	RCCBs functionally dependent on the line voltage operate correctly between 0,85 and 1,1 UN		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
	DELETE 9.17, Only applicable for RCCBs of type F		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		D1 - D2 - D3 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V)..... :	V	--

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Residual current 1,25.$I_{\Delta N}$.....:	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	D1 - D2 - D3 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	D1 - D2 - D3 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	D1 - D2 - D3 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		--
9.1.6 addition acc. IEC 62423	**Applicable for RCCBs of type B and F:** Verification of behaviour in the case of inrush residual currents		--
	Test acc. figure 2		N/A
	all switches and RCCB in closed position		N/A
	pulse with a peak current of 10 $I_{\Delta n}$ ..... (mA):		N/A
	Pulse on one pole chosen at random		N/A
	Six measurements: 3 times positive, 3 times negative		N/A
	Polarity changed after each test		N/A
	No tripping during test		N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.1.4 addition acc. IEC 62423	**Applicable for RCCBs of type B and F:** Verification of the correct operation for four-pole Type F RCCDs powered on two poles only		
	Tests performed with a four-pole RCCB acc. 9.1.2, but only supplied between neutral terminal and one-phase terminal chosen at random without load		N/A
9.1.2 addition acc. IEC 62423	**Applicable for RCCBs of type B and F:** Verification of the correct operation in case of steady increase of composite residual current		N/A
	starting composite residual current:		N/A
	Different frequency component values of test currents for calibration (RMS) / Composite starting current value (RMS)		--
	$I_{at\ rated\ frequency}$ / I_{1kHz} / $I_{F\ motor\ (10Hz)}$ / I_{Δ}		--
	0,138 $I_{\Delta N}$ / 0,138 $I_{\Delta N}$ / 0,035 $I_{\Delta N}$ / 0,2 $I_{\Delta N}$		--
	S1, S2 and RCCB in the closed position, residual current steady increase, starting from a value not higher than the starting composite value to attain the upper limit of residual operating current (1,4 $I_{\Delta N}$) within 30 s		N/A
	- tripping current between 0,5 $I_{\Delta N}$ and 1,4 $I_{\Delta n}$ (mA) ..... :	D1 – D2 – D3 –	N/A
9.2.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the operating characteristics at the reference temperature (20±5)°C		P
9.2.1.1 addition acc. IEC 62423	General		--
delete:	~~For multiple settings of $I_{\Delta n}$ tests are made for each setting~~		--
9.2.1.2 addition acc. IEC 62423	Verification of the correct operation in case of residual sinusoidal alternating currents up to 1000 Hz		--
b) delete:	~~Additional test for type S:~~		--
	~~- minimum non actuating time (ms) at: 14 $I_{\Delta n}$; 0,13 s :~~	~~D1 -~~ ~~D2 -~~ ~~D3 -~~	--
9.11.2.3	**Verification of the rated residual making and breaking capacity (A): I∆m :**		--

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.7.3 modify	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		--
	a) ..... :	D1 - OK D2 - OK D3 - OK	P
	b) ..... :	D1 - OK D2 - OK D3 - OK	P
	c) ..... :	D1 - OK D2 - OK D3 - OK	P
	d) ..... :	D1 - D2 - D3 -	N/A
	No flashover or breakdown ..... :	D1 - OK D2 - OK D3 - OK	P

***8.11 REPLACE BY*:**	Test device		
	RCCBs provided with a test device		P
	RCCBs with rated residual current of 30mA:		P
	Ampere-turns produced when operating the test device do not exceed 1,66 times the ampere turns produced by $I_{\Delta N}$	Ampere-turns: 46,8mA-turns 1,66 times the ampere-turns: 49,8 mA-turns	P
	RCCBs with rated residual current other than 30mA:		N/A
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere turns produced by $I_{\Delta N}$		N/A
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		N/A
9.12.2	Mechanical impact		P
	test acc. 9.12.2.1 for all types, in addition by the tests of:		--
	- 9.12.2.2 for RCCBs intended to be mounted on a rail and for all types of plug-in RCCBs designed for surface mounting;		P
	- 9.12.2.3 for plug-in type RCCBs, the holding in		N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	position of which depends solely on their connections.		
9.12.2.2 *replace by:*	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min		P
	Plug-in RCCBs designed for surface mounting are mounted complete with the appropriate means for the plug-in connection but without cables being connected and without any cover-plate.		N/A
	RCCB shall not become loose during test and no damage impairing its further use .....:	D1 – OK D2 – OK D3 – OK	P
9.12.2.3 *replace by:*	Plug-in type RCCBs, the holding in position of which depends solely on their connections, are mounted, complete with the appropriate plug-in base but without cables being connected and without any cover-plate, on a vertical rigid wall. A force of 20 N is applied to the RCCB portion at a point equidistant between the plug-in connections, without jerks for 1 min (see Figure Z4).		N/A

	TEST SEQUENCE D 3 samples: 400V415V, 63A, 30mA, 3P+N	**D-4**	**D-5**	**D-6**	--
	TEST D_0				--
9.9.1 *delete:*	~~For multiple settings of $I_{\Delta N}$ tests are made for each setting~~				--
9.1.7 addition acc. IEC 62423	**Only applicable for RCCBs of type F:** **(For Type B this test is replaced by the test of 9.2.1.4.)** Verification of the correct operation in case of residual pulsating direct currents in presence of a standing smooth direct current of 0,01 A				--
	Test acc. 9.21.1.4 but the smooth direct current of 0,006 A replaced by 0,01 A				N/A
	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,01 A:				--
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)				N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)				N/A
	- angle α = 0° (+/-) (+/- 10 mA) .....:	D4 – D5 – D6 –			N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting values		N/A
	TEST D_1		--
8	requirements for construction and operation		--
8.12	RCCBs functionally dependent on line voltage		--
	RCCBs functionally dependent on the line voltage operate correctly between 0,85 and 1,1 UN		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		--
	DELETE 9.17, Only applicable for RCCBs of type F		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		D4 - D5 - D6 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V) ..... :	V	--
	Residual current 1,25.$I_{\Delta N}$ ..... :	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	D4 - D5 - D6 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		--
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	D4 - D5 - D6 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	D4 - D5 -	N/A

EN 62423					
Clause	Requirement + Test			Result - Remark	Verdict
				D6 -	
b)	RCCBs opening with delay				N/A
	Values within the range indicated by manufacturer			to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N				N/A
	Voltage off and on at the line side:				N/A
	No automatically closing				N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*				--
9.1.6 addition acc. IEC 62423	**Applicable for RCCBs of type B and F:** Verification of behaviour in the case of inrush residual currents				--
	Test acc. figure 2				P
	all switches and RCCB in closed position				P
	pulse with a peak current of 10 $I_{\Delta n}$ ..... (mA):			300mA	P
	Pulse on one pole chosen at random				P
	Six measurements: 3 times positive, 3 times negative			3 times positive, 3 times negative	P
	Polarity changed after each test				P
	No tripping during test			Not trip	P
9.1.4 addition acc. IEC 62423	**Applicable for RCCBs of type B and F:** Verification of the correct operation for four-pole Type F RCCDs powered on two poles only				
	Tests performed with a four-pole RCCB acc. 9.1.2, but only supplied between neutral terminal and one-phase terminal chosen at random without load			Neutral and Phase A	P
9.1.2 addition acc. IEC 62423	**Applicable for RCCBs of type B and F:** Verification of the correct operation in case of steady increase of composite residual current				P
	starting composite residual current:			0,2IΔn=6mA	P
	Different frequency component values of test currents for calibration (RMS)			Composite starting current value (RMS)		--
	$I_{at\ rated\ frequency}$	I_{1kHz}	$I_{F\ motor\ (10Hz)}$	I_{Δ}		--
	0,138 $I_{\Delta N}$	0,138 $I_{\Delta N}$	0,035 $I_{\Delta N}$	0,2 $I_{\Delta N}$		--
	S1, S2 and RCCB in the closed position, residual current steady increase, starting from a value not higher than the starting composite value to attain the upper limit of residual operating current (1,4 $I_{\Delta N}$) within 30 s					P

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between 0,5 $I_{\Delta N}$ and 1,4 $I_{\Delta n}$ (mA) .....:	D4 – 32,0~32,5mA D5 – 32,2~32,4mA D6 – 32,0~32,2mA	P
9.2.1 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** Verification of the operating characteristics at the reference temperature (20±5)°C		P
9.2.1.1 addition acc. IEC 62423	General		--
delete:	~~For multiple settings of $I_{\Delta n}$ tests are made for each setting~~		--
9.2.1.2 addition acc. IEC 62423	Verification of the correct operation in case of residual sinusoidal alternating currents up to 1000 Hz		--
b) delete:	~~Additional test for type S:~~		--
	~~- minimum non actuating time (ms) at: 14 $I_{\Delta n}$; 0,13 s :~~	~~D4 -~~ ~~D5 -~~ ~~D6 -~~	--
9.11.2.3	Verification of the rated residual making and breaking capacity (A): I∆m :		--
9.7.3 modify	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		--
	a) .....:	D4 - OK D5 - OK D6 - OK	P
	b) .....:	D4 - OK D5 - OK D6 - OK	P
	c) .....:	D4 - OK D5 - OK D6 - OK	P
	d) .....:	D4 - D5 - D6 -	N/A
	No flashover or breakdown .....:	D4 - OK D5 - OK D6 - OK	P

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

***8.11 REPLACE BY*:**	Test device		--
	RCCBs provided with a test device		P
	RCCBs with rated residual current of 30mA:		P
	Ampere-turns produced when operating the test device do not exceed 1,66 times the ampere turns produced by $I_{\Delta N}$	Ampere-turns: 46,8mA-turns 1,66 times the ampere-turns:49,8 mA-turns	P
	RCCBs with rated residual current other than 30mA:		N/A
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere turns produced by $I_{\Delta N}$		N/A
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		N/A
9.12.2	Mechanical impact		P
	test acc. 9.12.2.1 for all types, in addition by the tests of:		--
	- 9.12.2.2 for RCCBs intended to be mounted on a rail and for all types of plug-in RCCBs designed for surface mounting;		P
	- 9.12.2.3 for plug-in type RCCBs, the holding in position of which depends solely on their connections.		N/A
9.12.2.2 *replace by:*	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min		P
	Plug-in RCCBs designed for surface mounting are mounted complete with the appropriate means for the plug-in connection but without cables being connected and without any cover-plate.		N/A
	RCCB shall not become loose during test and no damage impairing its further use .....:	D4 – OK D5 – OK D6 – OK	P
9.12.2.3 *replace by:*	Plug-in type RCCBs, the holding in position of which depends solely on their connections, are mounted, complete with the appropriate plug-in base but without cables being connected and without any cover-plate, on a vertical rigid wall. A force of 20 N is applied to the RCCB portion at a point equidistant between the plug-in connections, without jerks for 1 min (see Figure Z4).		N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

9.11.2.3c)	**Tests "D2"** 3 samples: 230V/240V, 63A, 30mA, 1P+N	**D_2-1**	**D_2-2**	**D_2-3**	--
modify:	Test voltage 110% of rated phase to neutral voltage for the pole exclusively for the neutral	256V			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				P
	a) .....:	D2-1 – OK D2-2 – OK D2-3 – OK			P
	b) .....:	D2-1 – OK D2-2 – OK D2-3 – OK			P
	c) .....:	D2-1 – OK D2-2 – OK D2-3 – OK			P
	d) .....:	D2-1 - D2-2 - D2-3 -			N/A
	No flashover or breakdown .....:	D2-1 – OK D2-2 – OK D2-3 – OK			P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current (ms)				--
		D2-1 – 107 D2-2 – 114 D2-3 – 104			P

9.11.2.3c)	**Tests "D2"** 3 samples: 400V415V, 63A, 30mA, 3P+N	**D_2-4**	**D_2-5**	**D_2-6**	--
modify:	Test voltage 110% of rated phase to neutral voltage for the pole exclusively for the neutral				N/A
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				P
	a) .....:	D2-4 – OK D2-5 – OK D2-6 – OK			P

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	b) .....:	D2-4 – OK D2-5 – OK D2-6 – OK	P
	c) .....:	D2-4 – OK D2-5 – OK D2-6 – OK	P
	d) .....:	D2-4 - D2-5 - D2-6 -	N/A
	No flashover or breakdown .....:	D2-4 – OK D2-5 – OK D2-6 – OK	P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current (ms)		--
		D2-4 – 108 D2-5 – 95 D2-6 – 101	P

	TEST SEQUENCE E 3 samples: 230V/240V, 63A, 30mA, 1P+N	**E-1**	**E-2**	**E-3**	--
9.11.2.4a)	Verification of the coordination at the rated conditional short-circuit current (A): Inc	10kA			--
modify:	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				P
	a) .....:	E1 – OK E2 – OK E3 – OK			P
	b) .....:	E1 – OK E2 – OK E3 – OK			P
	c) .....:	E1 – OK E2 – OK E3 – OK			P
	d) .....:	E1 - E2 - E3 -			N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	No flashover or breakdown .....:	E1 – OK E2 – OK E3 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		E1 - E2 - E3 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V) .....:	V	--
	Residual current 1,25.$I_{\Delta N}$ .....:	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	E1 - E2 - E3 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	E1 - E2 - E3 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	E1 - E2 - E3 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A
9.11.2.2	Verification of the rated making and breaking capacity (A): Im .....:	1000A	--
modify:	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		P
	a) .....:	E1 – OK E2 – OK E3 – OK	P
	b) .....:	E1 – OK E2 – OK E3 – OK	P
	c) .....:	E1 – OK E2 – OK E3 – OK	P
	d) .....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown .....:	E1 – OK E2 – OK E3 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		E1 - E2 - E3 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V) .....:	V	--
	Residual current 1,25.$I_{\Delta N}$ .....:	1,25.$I_{\Delta N}$ = A	--

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	E1 - E2 - E3 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		--
	- no value exceeds 0,5 s	E1 - E2 - E3 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	E1 - E2 - E3 -	N/A
b)	RCCBs opening with delay		--
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A

	TEST SEQUENCE E 3 samples: 400V415V, 63A, 30mA, 3P+N	**E-4**	**E-5**	**E-6**	--
9.11.2.4a)	Verification of the coordination at the rated conditional short-circuit current (A): Inc	10kA			--
modify:	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				P
	a) ..... :	E4 – OK E5 – OK E6 – OK			P
	b) ..... :	E4 – OK			P

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
		E5 – OK E6 – OK	
	c) ..... :	E4 – OK E5 – OK E6 – OK	P
	d) ..... :	E4 - E5 - E6 -	N/A
	No flashover or breakdown ..... :	E4 – OK E5 – OK E6 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		E4 - E5 - E6 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V)..... :	V	--
	Residual current 1,25.$I_{\Delta N}$..... :	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	E4 - E5 - E6 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	E4 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
		E5 - E6 -	
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	E4 - E5 - E6 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A
9.11.2.2	Verification of the rated making and breaking capacity (A): Im ..... :	1000A	--
modify:	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		P
	a) ..... :	E4 – OK E5 – OK E6 – OK	P
	b) ..... :	E4 – OK E5 – OK E6 – OK	P
	c) ..... :	E4 – OK E5 – OK E6 – OK	P
	d) ..... :	E4 - E5 - E6 -	N/A
	No flashover or breakdown ..... :	E4 – OK E5 – OK E6 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively		--

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Clause	Requirement + Test	Result - Remark	Verdict
	lowered to attain zero within about 30s until automatic opening occurs (V)		
		E4 - E5 - E6 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V)..... :	V	--
	Residual current 1,25.$I_{\Delta N}$..... :	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	E4 - E5 - E6 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		--
	- no value exceeds 0,5 s	E4 - E5 - E6 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	E4 - E5 - E6 -	N/A
b)	RCCBs opening with delay		--
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A

	TEST SEQUENCE F 3 samples: 230V/240V, 63A, 30mA, 1P+N	**F-1**	**F-2**	**F-3**	--

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Clause	Requirement + Test	Result - Remark	Verdict
9.11.2.4b)	Verification of the coordination at the rated making and breaking capacity (A): Im ..... :	1000A	--
modify:	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		P
	a) ..... :	F1 – OK F2 – OK F3 – OK	P
	b) ..... :	F1 – OK F2 – OK F3 – OK	P
	c) ..... :	F1 – OK F2 – OK F3 – OK	P
	d) ..... :	F1 - F2 - F3 -	N/A
	No flashover or breakdown ..... :	F1 – OK F2 – OK F3 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		F1 - F2 - F3 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V)..... :	V	--
	Residual current 1,25.$I_{\Delta N}$..... :	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	F1 - F2 - F3 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F1 - F2 - F3 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A
9.11.2.4c)	Verification of the coordination at the rated conditional residual short-circuit current (A): IΔc . :	10kA	--
modify:	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		P
	a) ..... :	F1 – OK F2 – OK F3 – OK	P
	b) ..... :	F1 – OK F2 – OK F3 – OK	P
	c) ..... :	F1 – OK F2 – OK F3 – OK	P
	d) ..... :	F1 - F2 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
		F3 -	
	No flashover or breakdown ..... :	F1 – OK F2 – OK F3 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		F1 - F2 - F3 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V)..... :	V	--
	Residual current 1,25.$I_{\Delta N}$..... :	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	F1 - F2 - F3 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	F1 - F2 - F3 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F1 - F2 - F3 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A

	TEST SEQUENCE F 3 samples: 230V/240V, 16A, 300mA, 1P+N	**F-4**	**F-5**	**F-6**	--
9.11.2.4b)	Verification of the coordination at the rated making and breaking capacity (A): Im ..... :	1000A			--
modify:	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				P
	a) ..... :	F4 – OK F5 – OK F6 – OK			P
	b) ..... :	F4 – OK F5 – OK F6 – OK			P
	c) ..... :	F4 – OK F5 – OK F6 – OK			P
	d) ..... :	F4 - F5 - F6 -			N/A
	No flashover or breakdown ..... :	F4 – OK F5 – OK F6 – OK			P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**				--
9.17.1 replace by:	Limiting value of the line voltage U_x				N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)				--
		F4 - F5 -			N/A

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Clause	Requirement + Test	Result - Remark	Verdict
		F6 -	
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V).....:	V	--
	Residual current 1,25.$I_{\Delta N}$.....:	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	F4 - F5 - F6 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	F4 - F5 - F6 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F4 - F5 - F6 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A
9.11.2.4c)	Verification of the coordination at the rated conditional residual short-circuit current (A): I∆c . :	10kA	--
modify:	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		P
	a) ..... :	F4 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
		F5 – OK F6 – OK	
	b) ..... :	F4 – OK F5 – OK F6 – OK	P
	c) ..... :	F4 – OK F5 – OK F6 – OK	P
	d) ..... :	F4 - F5 - F6 -	N/A
	No flashover or breakdown ..... :	F4 – OK F5 – OK F6 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		F4 - F5 - F6 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V)..... :	V	--
	Residual current 1,25.$I_{\Delta N}$..... :	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	F4 - F5 - F6 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of		--

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Clause	Requirement + Test	Result - Remark	Verdict
	the main contacts:		
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	F4 - F5 - F6 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F4 - F5 - F6 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A

	TEST SEQUENCE F 3 samples: 400V415V, 63A, 30mA, 3P+N	**F-7**	**F-8**	**F-9**	--
9.11.2.4b)	Verification of the coordination at the rated making and breaking capacity (A): Im ..... :	1000A			--
modify:	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				P
	a) ..... :	F7 – OK F8 – OK F9 – OK			P
	b) ..... :	F7 – OK F8 – OK F9 – OK			P
	c) ..... :	F7 – OK F8 – OK F9 – OK			P
	d) ..... :	F7 - F8 - F9 -			N/A
	No flashover or breakdown ..... :	F7 – OK			P

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Clause	Requirement + Test	Result - Remark	Verdict
		F8 – OK F9 – OK	
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		F7 - F8 - F9 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V).....:	V	--
	Residual current 1,25.$I_{\Delta N}$.....:	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	F7 - F8 - F9 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	F7 - F8 - F9 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F7 - F8 - F9 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A
9.11.2.4c)	Verification of the coordination at the rated conditional residual short-circuit current (A): I∆c . :	10kA	--
modify:	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		P
	a) ..... :	F7 – OK F8 – OK F9 – OK	P
	b) ..... :	F7 – OK F8 – OK F9 – OK	P
	c) ..... :	F7 – OK F8 – OK F9 – OK	P
	d) ..... :	F7 - F8 - F9 -	N/A
	No flashover or breakdown ..... :	F7 – OK F8 – OK F9 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		F7 - F8 - F9 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V)..... :	V	--
	Residual current 1,25.$I_{\Delta N}$..... :	1,25.$I_{\Delta N}$ = A	--

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Clause	Requirement + Test	Result - Remark	Verdict
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	F7 - F8 - F9 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	F7 - F8 - F9 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F7 - F8 - F9 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A

	TEST SEQUENCE F 3 samples: 400V415V, 16A, 300mA, 3P+N	**F-10**	**F-11**	**F-12**	--
9.11.2.4b)	Verification of the coordination at the rated making and breaking capacity (A): Im ..... :	1000A			--
modify:	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				P
	a) ..... :	F10 – OK F11 – OK F12 – OK			P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) ..... :	F10 – OK F11 – OK F12 – OK	P
	c) ..... :	F10 – OK F11 – OK F12 – OK	P
	d) ..... :	F10 - F11 - F12 -	N/A
	No flashover or breakdown ..... :	F10 – OK F11 – OK F12 – OK	P
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		F10 - F11 - F12 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V)..... :	V	--
	Residual current 1,25.$I_{\Delta N}$..... :	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	F10 - F11 - F12 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- no value exceeds 0,5 s	F10 - F11 - F12 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F10 - F11 - F12 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A
9.11.2.4c)	Verification of the coordination at the rated conditional residual short-circuit current (A): I∆c . :	10kA	--
modify:	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		P
	a) ..... :	F10 – OK F11 – OK F12 – OK	P
	b) ..... :	F10 – OK F11 – OK F12 – OK	P
	c) ..... :	F10 – OK F11 – OK F12 – OK	P
	d) ..... :	F10 - F11 - F12 -	N/A
	No flashover or breakdown ..... :	F10 – OK F11 – OK F12 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.17	**Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage**		--
9.17.1 replace by:	Limiting value of the line voltage U_x		N/A
	U_N applied to the line terminals and progressively lowered to attain zero within about 30s until automatic opening occurs (V)		--
		F10 - F11 - F12 -	N/A
	All values less than 0,7 U_N		N/A
	Tripping test:		N/A
	Test voltage (V).....:	V	--
	Residual current 1,25.$I_{\Delta N}$.....:	1,25.$I_{\Delta N}$ = A	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)	F10 - F11 - F12 -	N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with U_N and line voltage, then switched off		N/A
	Time interval between switching off and opening of the main contacts:		--
a)	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s	F10 - F11 - F12 -	N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F10 - F11 - F12 -	N/A
b)	RCCBs opening with delay		N/A
	Values within the range indicated by manufacturer	to ms	N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side:		N/A
	No automatically closing		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.17.4 replace by:	Verification of the correct operation of RCCBs with 3 or 4 poles, in presence of a residual current, the neutral and one line terminal only being energized *(replace the title by)*		N/A

modify:	**TEST SEQUENCE G** 3 samples: 230V/240V, 63A, 30mA, 1P+N	**G-1**	**G-2**	**G-3**	--
9.22	**Verification of reliability**				P
9.22.1	Climatic test				P

modify:	**TEST SEQUENCE G** 3 samples: 230V/240V, 16A, 300mA, 1P+N	**G-4**	**G-5**	**G-6**	--
9.22	**Verification of reliability**				P
9.22.1	Climatic test				P

modify:	**TEST SEQUENCE G** 3 samples: 400V415V, 63A, 30mA, 3P+N	**G-7**	**G-8**	**G-9**	--
9.22	**Verification of reliability**				P
9.22.1	Climatic test				P

modify:	**TEST SEQUENCE G** 3 samples: 400V415V, 16A, 300mA, 3P+N	**G-10**	**G-11**	**G-12**	--
9.22	**Verification of reliability**				P
9.22.1	Climatic test				P

	TEST SEQUENCE "G_1" **(add the new test sequence)** 3 samples: 400V415V, 63A, 30mA, 3P+N	**G_1-1**	**G_1-2**	**G_1-3**	
8	**requirements for construction and operation**				
add: 8.Z1	**Behaviour of RCCBs at low ambient air temperature**				
	RCCBs for use between -25°C and +40°C operate reliably at low ambient air temperature				P
add: 9.Z1	**Verification of the correct operation at low ambient air temperature for RCCBs for use at temperatures between -25° C and +40° C**				--
	RCCBs mounted in enclosure with degree of protection IP 55 and connected for normal use				P
	RCCBs in a test chamber at +23°C ± 2°C and				P

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	rH 90% ± 3%		
	RCCBs in ON-position without load		P
	Five test cycles performed acc. to figure Z6		P
	No tripping during cycles		P
	At the end of last 6 h period at -25°C an a.c. residual current is passed through one pole (see figure 4a)		P
	- general type:		--
	break time (ms) at 1,25 $I_{\Delta N}$ not exceeding the value for $I_{\Delta N}$ in table 1	G1-1 – 105 G1-2 – 94 G1-3 – 98	P
	- S-type:		--
	break time (ms) at 2,5 $I_{\Delta N}$ not exceeding the value for 2 $I_{\Delta N}$ in table 1	G1-1 - G1-2 - G1-3 -	N/A
	Additionally for RCCBs of type A:		--
	Break time with pulsating d.c. residual currents of		--
	- 1,25 $I_{\Delta N}$ (general type)		P
	- 2,5 $I_{\Delta N}$ (S-type)		N/A
	Multiplied by:		--
	1,4 for $I_{\Delta N}$ > 0,01 A (ms)	G1-1 – 65 G1-2 – 76 G1-3 – 61	P
	2 for $I_{\Delta N} \leq$ 0,01 A (ms)	G1-1 - G1-2 - G1-3 -	N/A
	at α = 0°el (test circuit figure 4b)		P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current		--
		G1-1 – 92 G1-2 – 87 G1-3 – 95	P
	After test possible to switch on the RCCB without presence of residual current		P

	TEST SEQUENCE "G_1" **(add the new test sequence)** 3 samples: 400V415V, 16A, 300mA, 3P+N	**G_1-4**	**G_1-5**	**G_1-6**	--

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
8	**requirements for construction and operation**		--
add: 8.Z1	**Behaviour of RCCBs at low ambient air temperature**		**--**
	RCCBs for use between -25°C and +40°C operate reliably at low ambient air temperature		P
add: 9.Z1	**Verification of the correct operation at low ambient air temperature for RCCBs for use at temperatures between -25° C and +40° C**		**--**
	RCCBs mounted in enclosure with degree of protection IP 55 and connected for normal use		P
	RCCBs in a test chamber at +23°C ± 2°C and rH 90% ± 3%		P
	RCCBs in ON-position without load		P
	Five test cycles performed acc. to figure Z6		P
	No tripping during cycles		P
	At the end of last 6 h period at -25°C an a.c. residual current is passed through one pole (see figure 4a)		P
	- general type:		--
	break time (ms) at 1,25 $I_{\Delta N}$ not exceeding the value for $I_{\Delta N}$ in table 1	G1-4 – 35 G1-5 – 41 G1-6 – 38	P
	- S-type:		--
	break time (ms) at 2,5 $I_{\Delta N}$ not exceeding the value for 2 $I_{\Delta N}$ in table 1	G1-4 - G1-5 - G1-6 -	N/A
	Additionally for RCCBs of type A:		--
	Break time with pulsating d.c. residual currents of		--
	- 1,25 $I_{\Delta N}$ (general type)		P
	- 2,5 $I_{\Delta N}$ (S-type)		N/A
	Multiplied by:		--
	1,4 for $I_{\Delta N}$ > 0,01 A (ms)	G1-4 – 25 G1-5 – 26 G1-6 – 32	P
	2 for $I_{\Delta N} \leq$ 0,01 A (ms)	G1-4 - G1-5 - G1-6 -	N/A
	at α = 0°el (test circuit figure 4b)		P
9.2.4 addition acc. IEC 62423	**Only applicable for RCCBs of type B:** The RCCB shall trip with a test current of 2,5 $I_{\Delta n}$		--

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	with smooth direct current		
		G1-4 – 90 G1-5 – 92 G1-6 – 92	P
	After test possible to switch on the RCCB without presence of residual current		P
9.2.5 add:	**Electromagnetic Compatibility (EMC)**		--
	TEST SEQUENCE "H" 3 samples: 400V415V, 63A, 30mA, 3P+N	**H1 H2 H3**	--
EN 61543:		See report 2506B1062SHA	--
Table 4-T 1.1	Harmonics, interharmonics		--
Table 4-T 1.2	Signalling voltage		--
Add:			
Table 5-T 2.3	Conducted unidirectional transients of the ms and μs time scale		--
T 2.3b *Add:*	During the test RCCB no trip		P
Add:	After the test, RCCB trip with a smooth direct test current of 2.5 IΔn (ms) according to 9.2.4		P
	TEST SEQUENCE "I" 3 samples: 400V415V, 63A, 30mA, 3P+N	**I1 I2 I3**	--
EN 61543:		See report 2506B1062SHA	--
Table 5-T 2.1	Conducted sine-wave voltages or currents		--
Add:	During the test RCCB no trip at continuously applied smooth direct current of 0,2 IΔn		P
Add:	During the test RCCB trip with a smooth direct current of 2,5 IΔn		P
Table 5-T 2.5	Radiated high-frequency phenomena		--
Add:	During the test RCCB remain closed at continuously applied smooth direct current of 0,2 IΔn		P
Add:	During the test RCCB trip with a smooth direct current of 2,5 IΔn		P

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
Table 5-T 2.2	Fast transients (burst)		--
Add:	During the test RCCB no trip		P
Add:	After the test, RCCB trip with a smooth direct test current of 2.5 IΔn (ms) according to 9.2.4		P
	TEST SEQUENCE "J" 3 samples: 400V415V, 63A, 30mA, 3P+N	**J1 J2 J3**	--
EN 61543:		See report 2506B1062SHA	--
Table 5-T 2.6	Conducted common mode disturbances in the frequency range lower than 150 kHz		--
Add:	The RCCB remain closed at continuously applied smooth direct current of 0,2 IΔn		P
Add:	The RCCB trip with a smooth direct current of 2,5 IΔn		P
Table 6-T 3.1	Electrostatic discharges		--
Add:	During the test RCCB may trip		P
Add:	After each tripping RCCB is reclosed		P
Add:	After the test, RCCB trip with a smooth direct test current of 2.5 IΔn (ms) according to 9.2.4		P

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX A (NORMATIVE)

Number of samples to be submitted and test sequences to be applied for verification of conformity for Type F RCCBs
Table A.1 - Test sequences

Test sequence		Clause or subclause acc. to EN 61008-1 and EN 61008-2-1	Additional tests acc. to EN 62423	Test (or inspection)
A_1		6 8.1.1 8.1.2 9.3 8.1.3 9.15 9.4 9.5 9.6 9.13.1 9.13.2, 9.13.3 8.1.3 9.25	6 No No No No No No No No No No No No	Marking General Mechanism Indelibility of marking Clearance and creepage distances (external parts only) Trip free mechanism Reliability of screws, current-carrying parts and connections Reliability of terminals for external conductors Protection against electric shock Resistance to heat Resistance to heat Clearances and creepage distances (internal parts) Resistance to rusting
A_2		9.14	No	Resistance to abnormal heat and to fire
B		9.7 9.8 9.20 9.22.2 9.23	No No No No No	Dielectric properties Temperature-rise Resistance of insulation against impulse voltages Reliability at 40°C Ageing of electronic components
C		9.10	No	Mechanical and electrical endurance
D	D_0	9.9 --- ---	No 9.1.2 9.1.3	Residual operating characteristics Verification of the correct operation in case of steady increase of composite residual current Verification of the correct operation in case of sudden appearance of composite residual current
		9.9.3	9.1.7	Type A residual current devices
	D_1	9.19 --- --- 9.11.2.3 a)b) 9.16 9.12 9.18	9.1.5 9.1.6 9.1.4 No No No No	Unwanted tripping Behaviour in the case of surge currents Behaviour in the case of inrush residual currents Correct operation of RCD powered on two poles only Performance at $I_{\Delta m}$ Test device Resistance to mechanical shock and impact Non-operating current under overcurrent conditions
D_2		9.11.2.3 c)	No	Verification of the suitability of RCCBs for use in IT-systems
E		9.11.2.4 a)	No	Coordination at I_{nc}
		9.11.2.2	No	Performance at I_m
F		9.11.2.4 b)	No	Coordination at I_m
		9.11.2.4 c)	No	Coordination at $I_{\Delta c}$
G_0		9.22.1	No	Reliability (climatic tests)
G_1		9.Z.1	No	Verification of correct operation at low ambient air temperature of RCCBs for use in the range of -25°C to +40°C
H [a)]		EN 61543 Table 4 -T1.1 EN 61543 Table 4 -T1.2 EN 61543 Table 5 -T2.3	No No No	Harmonics, interharmonics Signalling voltage Conducted unidirectional transients of the ms and µs time scale
I		EN 61543 Table 5 -T2.1 EN 61543 Table 5 -T2.5 EN 61543 Table 5 -T2.2	No No No	Conducted oscillatory voltages or currents Radiated high-frequency phenomena Conducted unidirectional transients of the ns time scale (burst)
J		EN 61543 Table 5 - T2.6 EN 61543 Table 6 -T3.1	No No	Conducted common mode disturbances in the frequency range lower than 150 kHz Electrostatic discharges

a) For devices containing a continuously operating oscillator, the test of CISPR 14-1 shall be carried out on the samples prior to the tests of this sequence.

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX C (NORMATIVE)

Number of samples to be submitted and test sequences to be applied for verification of conformity for Type B RCCBs
Table C.1 - Test sequences

Test sequence		Clause or subclause acc. to EN 61008-1 and EN 61008-2-1	Additional tests acc. to EN 62423	Test (or inspection)
A_1		6 8.1.1 8.1.2 9.3 8.1.3 9.15 9.4 9.5 9.6 9.13.1 9.13.2, 9.13.3 8.1.3 9.14	6 No No No No No No No No 9.2.4 No No No	Marking General Mechanism Indelibility of marking Clearance and creepage distances (external parts only) Trip free mechanism Reliability of screws, current-carrying parts and connections Reliability of terminals for external conductors Protection against electric shock Verification of the RCD after test sequence, Resistance to heat Resistance to heat Clearances and creepage distances (internal parts) Resistance to abnormal heat and to fire
B		9.7 9.8 9.20 9.22.2 9.23 ---	No No No No No 9.2.4	Dielectric properties Temperature-rise Resistance of insulation against impulse voltages Reliability at 40°C Ageing of electronic components Verification of the RCD after test sequence
C		9.10 ---	No 9.2.4	Mechanical and electrical endurance Verification of the RCD after test sequence
D	D_0	9.9 --- --- --- 9.9.3	No 9.1.2 9.1.3 9.2.1.7.1 9.1.7	Residual operating characteristics Verification of the correct operation in case of steady increase of composite residual current Verification of the correct operation in case of sudden appearance of composite residual current Verification of the correct operation in case of residual smooth direct current without load for ratings of $I_{\Delta n}$ not tested in D_1 Type A residual current devices
	D_1	9.17 9.19 --- --- --- --- --- 9.11.2.3 a)b) 9.16 9.12 9.18 ---	No 9.1.5 9.1.6 9.1.4 9.2.3 9.2.1 9.2.2 No No No No 9.2.4	Behaviour in case of failure of the line voltage Behaviour in the case f surge currents Behaviour in the case of inrush residual currents Correct operation for RCD powered on two poles only Correct operation for RCD powered on two poles only Type B residual current devices Tests at temperature limits Performance at $I_{\Delta m}$ Test device Resistance to mechanical shock and impact Non-operating current under overcurrent conditions Verification of the RCD after test sequence
D_2		9.11.2.3 c) ---	No 9.2.4	Verification of the suitability of RCCBs for use in IT-systems Verification of the RCD after test sequence
E		9.11.2.4 a)	No	Coordination at I_{nc}
		9.11.2.2	No	Performance at I_m
		---	9.2.4	Verification of the RCD after test sequence
F		9.11.2.4 b)	No	Coordination at I_m
		9.11.2.4 c)	No	Coordination at $I_{\Delta c}$
		---	9.2.4	Verification of the RCD after test sequence
G_0		9.22.1 ---	No 9.2.4	Reliability (climatic tests) Verification of the RCD after test sequence
G_1		9.Z.1 ---	No 9.2.4	Verification of correct operation at low ambient air temperature of RCCBs for use in the range of -25°C to +40°C Verification of the RCD after test sequence
H [a)]		EN 61543 Table 4 -T1.1 EN 61543 Table 4 -T1.2 EN 61543 Table 5 -T2.3	No No No	Harmonics, interharmonics Signalling voltage Conducted unidirectional transients of the ms and µs time scale
I		EN 61543 Table 5 -T2.1 EN 61543 Table 5 -T2.5 EN 61543 Table 5 -T2.2	No No No	Conducted oscillatory voltages or currents Radiated high-frequency phenomena Conducted unidirectional transients of the ns time scale (burst)
J		EN 61543 Table 5 - T2.6 EN 61543 Table 6 -T3.1	No No	Conducted common mode disturbances in the frequency range lower than 150 kHz Electrostatic discharges

a) For devices containing a continuously operating oscillator, the test of CISPR 14-1 shall be carried out on the samples prior to the tests of this sequence.
b) This test may be done on separate samples.

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

replace table A.2 by:

Table A.2 - Number of samples for full test procedure

Test sequence [a]	Number of samples	Minimum number of accepted samples [b]	Maximum number of samples for repeated tests [c]
A_1	1	1	--
A_2	3	2	3
B	3	2	3
C	3	2	3
D	3	2 [d]	3
D_2	3	3	3
E	3	2 [d]	3
F	3	2 [d]	3
G_0	3	2	3
G_1	3	2	3
H [e]	3	2	3
I [e]	3	2	3
J [e]	3	2	3

a) In total a maximum of three test sequences may be repeated.

b) It is assumed that a sample which has not passed a test has not met the requirements due to workmanship or assembly defects which are not representative of the design.

c) In the case of repeated tests, all test results must be acceptable.

d) All samples shall meet the requirements in 9.9.2.1, 9.9.2.2, 9.9.2.3, 9.9.2.4, 9.9.2.5 and 9.11.2.3, as appropriate. In addition, permanent arcing or flashover between poles or between poles and frame shall not occur in any sample during tests of 9.11.2.2, 9.11.2.4 a), 9.11.2.4 b) or 9.11.2.4 c).

e) At the manufacturer's request, the same set of samples may be subjected to more than one of these test sequences.

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

replace table A.3 by:

Table A.3 - Number of samples for simplified test procedure

Test sequence	Number of samples according to the number of poles [a) g)]		
	2-poles [b) c)]	3-poles [d) f) i)]	4-poles [e)]
A_1	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$
A_2	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
B	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
C	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
$D_0 + D_1$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
D_0	1 for all other ratings of $I_{\Delta N}$		
D_2	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
E	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
F	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$
G_0 [j)]	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
G_1 [h)]	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$
H			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$
I			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$
J			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$

a) If a test is to be repeated according to the minimum performance criteria of clause A.2, a new set of samples is used for the relevant test. In the repeated test all test results must be acceptable.
b) If only 3-pole or 4-pole RCCBs are submitted, this column shall also apply to a set of samples with the smallest number of poles.
c) deleted
d) deleted
e) deleted
f) This column is omitted when 4-pole RCCBs have been tested.
g) If only one value of $I_{\Delta N}$ is submitted, min. rating $I_{\Delta N}$ and max. rating $I_{\Delta N}$ are replaced by $I_{\Delta N}$.
h) Only the highest number of pole.
i) deleted
j) If the requirements t test max. rating I_N and minimum rating $I_{\Delta N}$ does not cover all the possible range of RCBOs, the minimum $I_{\Delta N}$ shall in any case be chosen for the test

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX J **Particular requirements for RCCBs with screwless type terminals for external copper conductors**		--
J.1 *modify:*	**THIS ANNEX APPLIES TO RCCBS WITHIN THE SCOPE OF CLAUSE 1, EQUIPPED WITH UNIVERSAL SCREWLESS TERMINALS, FOR CURRENT NOT EXCEEDING 20 A PRIMARILY SUITABLE FOR CONNECTING UNPREPARED (SEE J.3.6) COPPER CONDUCTORS OF CROSS-SECTION UP TO 4 MM^2.**		--
J.6 *modify:*	MARKING		**--**
	non-universal terminals (if accepted by Special National Conditions):		N/A
	terminals for rigid-solid conductors marked by “sol”		N/A
	terminals for rigid (solid and stranded) conductors marked by “r”		N/A
	terminals for flexible conductors marked by “f”		N/A

	ANNEX K **Particular requirements for RCCBs with flat quick-connect terminations**		--
K.8.2.2 *modify:*	The nominal width of the male tab is 6,3 mm and the thickness 0,8 mm, applicable to rated currents up to and including 16 A. ~~NOTE 1:The use for rated currents up to and including~~ ~~20 A is accepted in BE, FR, IT, PT, ES and US~~		N/A

	ANNEX L **Specific requirements for RCCBs with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors**		--
	DELETE ANNEX L		N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX ZB **Special national conditions**					--
	Special national conditions acc EN 62423:					--
Netherlands	All tests together with these requirements apply for 2 pole type B RCCB for use in TN and TT distribution systems for protection of line and neutral circuits (L-N)					N/A
8.2.1.4	Add to this clause the following text (Not applicable for 2 pole devices L-N)					N/A
8.2.1.5	Add to this clause the following text (Not applicable for 2 pole devices)					N/A
8.2.1.6	Add to this clause the following text (Not applicable for 2 pole devices)					N/A
8.2.1.8	Add the following new subclause:					N/A
8.2.1.8	**Residual pulsating direct currents originating from a single phase inverter circuit connected to the supply system**					N/A
	2 pole type B RCCBs shall operate in response to a steady increase of residual pulsating direct currents resulting from an inverter connected to the supply system within the limits of the composed residual current according to table 3 between the values $I_{\Delta 1}$ and $I_{\Delta 2}$.					N/A
	2 pole type B RCCBs shall operate in response to a sudden appearance of residual pulsating direct currents resulting from an inverter connected to the supply system within the time limits specified in table 3 for the currents $I_{\Delta 2}$, $I_{\Delta 3}$ and $\geq I_{\Delta 4}$.					N/A
	Compliance is checked by the test of 9.2.1.8.1 and 9.2.1.8.2.					N/A
	Table 3:					N/A
	Standard values of break time (s) at a residual current composed by a smooth dc current and a half wave rectified sinusoidal current having opposite polarity					
		$I_{\Delta 1}$	$I_{\Delta 2}$	$I_{\Delta 3}$	$I_{\Delta 4}$	
	Smooth residual current	+ 1,5 $I_{\Delta n}$	+ 3 $I_{\Delta n}$	+ 6 $I_{\Delta n}$	+ 15 $I_{\Delta n}$	
	Half wave sinusoidal residual current (peak value)	- 1,125 $I_{\Delta n}$	- 2,25 $I_{\Delta n}$	- 4,5 $I_{\Delta n}$	- 11,25 $I_{\Delta n}$	
	Break time	Non-tripping	0,3	0,15	0,04	
9.2.1.7	modify the heading reading: Verification of the correct operation of 3 and 4 pole type B RCCBs in case of residual smooth direct current					--
9.2.1.8	Add a following new clause: Verification of the correct operation of 2 pole type B RCCBs in case of residual direct currents when protecting a single phase inverter circuit connected to the supply					--
	RCCB connected as shown in Figure 1 and supplied with rated voltage					N/A
9.2.1.8.1	Slowly rising residual pulsating current					--
	Test circuit connected to line and neutral terminal or if applicable to the line terminals, the RCCD and S_1 being closed					N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	The test currents I_1 and I_2 are set to: 0,2 x the values as given for the tripping current $I_{\Delta 2}$.		N/A
	I_1: (0,2 x 3 $I_{\Delta n}$) = 0,6 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (0,2 x 2,25 $I_{\Delta n}$) = 0,45 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A
	no tripping	D1 - D2 - D3 -	N/A
	I_1: (0,3 x 3 $I_{\Delta n}$) = 0,9 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (0,3 x 2,25 $I_{\Delta n}$) = 0,675 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A
	no tripping	D1 - D2 - D3 -	N/A
	I_1: (0,4 x 3 $I_{\Delta n}$) = 1,2 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (0,4 x 2,25 $I_{\Delta n}$) = 0,9 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A
	no tripping	D1 - D2 - D3 -	N/A
	I_1: (0,5 x 3 $I_{\Delta n}$) = 1,5 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (0,5 x 2,25 $I_{\Delta n}$) = 1,125 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A
	no tripping	D1 - D2 - D3 -	N/A
	tripping	D1 - D2 - D3 -	N/A
	I_1: (0,6 x 3 $I_{\Delta n}$) = 1,8 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (0,6 x 2,25 $I_{\Delta n}$) = 1,35 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A
	no tripping	D1 - D2 - D3 -	N/A
	tripping	D1 - D2 - D3 -	N/A
	I_1: (0,7 x 3 $I_{\Delta n}$) = 2,1 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (0,7 x 2,25 $I_{\Delta n}$) = 1,575 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	no tripping	D1 - D2 - D3 -	N/A
	tripping	D1 - D2 - D3 -	N/A
	I_1: (0,8 x 3 $I_{\Delta n}$) = 2,4 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (0,8 x 2,25 $I_{\Delta n}$) = 1,8 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A
	no tripping	D1 - D2 - D3 -	N/A
	tripping	D1 - D2 - D3 -	N/A
	I_1: (0,9 x 3 $I_{\Delta n}$) = 2,7 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (0,9 x 2,25 $I_{\Delta n}$) = 2,025 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A
	no tripping	D1 - D2 - D3 -	N/A
	tripping	D1 - D2 - D3 -	N/A
	I_1: (1 x 3 $I_{\Delta n}$) = 3 $I_{\Delta n}$ smooth dc	A	N/A
	I_2: (1 x 2,25 $I_{\Delta n}$) = 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)	A	N/A
	tripping	D1 - D2 - D3 -	N/A
	No tripping before the current reaches the value $I_{\Delta 1}$ and tripping before this current exceeds the value $I_{\Delta 2}$		N/A
9.2.1.8.2	**9.1.7.2 Suddenly appearing residual pulsating current**		--
	RCCB initially closed but bypassed by calibration links B_L. With switches S and S_1 closed the currents I_1 and I_2 are set in turn to the values as applicable for $I_{\Delta 2}$, $I_{\Delta 3}$ and $I_{\Delta 4}$, respectively, as given in Table 3.		N/A
	Switches S and S_1 are then opened and the calibration links are removed.		N/A
	Switch S is first closed, then S_1 is closed and the residual currents start to flow.		N/A
	$I_{\Delta 2}$:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,3 s:	[ms]	--
		D1 - D2 - D3 -	N/A
	$I_{\Delta 3}$:		N/A
	I_1: 6 $I_{\Delta n}$ smooth dc		N/A
	I_2: 4,5 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,15 s:	[ms]	--
		D1 - D2 - D3 -	N/A
	$I_{\Delta 4}$:		N/A
	I_1: 15 $I_{\Delta n}$ smooth dc		N/A
	I_2: 11,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,04 s:	[ms]	--
		D1 - D2 - D3 -	N/A
	Verification of RCCBs after subclause: **Test sequence A, 9.13.1 Resistance to heat**		--
9.2.4	Verification of the RCCB after test sequences Only applicable for RCCBs of type B:		--
	2 pole RCCBs shall trip with the composite residual test current $I_{\Delta 2}$ as specified in Table 3		N/A
	$I_{\Delta 2}$:		N/A
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,3 s:	[ms]	--
		A1 -	N/A
	3 and 4 pole type RCCBs shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current	[ms]	--
		A1 -	N/A
	Verification of RCCBs after subclause: **Test sequence B, 9.23 Ageing of electronic components**		--
9.2.4	Verification of the RCCB after test sequences Only applicable for RCCBs of type B:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	2 pole RCCBs shall trip with the composite residual test current $I_{\Delta 2}$ as specified in Table 3		N/A
	$I_{\Delta 2}$:		N/A
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,3 s:	[ms]	--
		B1 - B2 - B3 -	N/A
	3 and 4 pole type RCCBs shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current	[ms]	--
		B1 - B2 - B3 -	N/A
	Verification of RCCBs after subclause: **Test sequence C, 9.10 Mechanical and electrical endurance**		--
9.2.4	Verification of the RCCB after test sequences Only applicable for RCCBs of type B:		--
	2 pole RCCBs shall trip with the composite residual test current $I_{\Delta 2}$ as specified in Table 3		N/A
	$I_{\Delta 2}$:		N/A
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,3 s:	[ms]	--
		C1 - C2 - C3 -	N/A
	3 and 4 pole type RCCBs shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current	[ms]	--
		C1 - C2 - C3 -	N/A
	Verification of RCCBs after subclause: **Test sequence D_2, 9.11.2.3 c) Verification of the suitability in IT system**		--
9.2.4	Verification of the RCCB after test sequences Only applicable for RCCBs of type B:		--
	2 pole RCCBs shall trip with the composite residual test current $I_{\Delta 2}$ as specified in Table 3		N/A
	$I_{\Delta 2}$:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,3 s:	[ms]	--
		D1 - D2 - D3 -	N/A
	3 and 4 pole type RCCBs shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current	[ms]	--
		D1 - D2 - D3 -	N/A
	Verification of RCCBs after subclause: **Test sequence E, 9.11.2.2 Performance at I_m**		--
9.2.4	Verification of the RCCB after test sequences Only applicable for RCCBs of type B:		--
	2 pole RCCBs shall trip with the composite residual test current $I_{\Delta 2}$ as specified in Table 3		N/A
	$I_{\Delta 2}$:		N/A
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,3 s:	[ms]	--
		E1 - E2 - E3 -	N/A
	3 and 4 pole type RCCBs shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current	[ms]	--
		E1 - E2 - E3 -	N/A
	Verification of RCCBs after subclause: **Test sequence F, 9.11.2.4 c) Coordination at $I_{\Delta C}$**		--
9.2.4	Verification of the RCCB after test sequences Only applicable for RCCBs of type B:		--
	2 pole RCCBs shall trip with the composite residual test current $I_{\Delta 2}$ as specified in Table 3		N/A
	$I_{\Delta 2}$:		N/A
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	break time ..... max. 0,3 s:	[ms]	--
		F1 - F2 - F3 -	N/A
	3 and 4 pole type RCCBs shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current	[ms]	--
		F1 - F2 - F3 -	N/A
	Verification of RCCBs after subclause: **Test sequence G_0, 9.22.1 Reliability (climatic tests)**		--
9.2.4	Verification of the RCCB after test sequences Only applicable for RCCBs of type B:		--
	2 pole RCCBs shall trip with the composite residual test current $I_{\Delta 2}$ as specified in Table 3		N/A
	$I_{\Delta 2}$:		N/A
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,3 s:	[ms]	--
		G1 - G2 - G3 -	N/A
	3 and 4 pole type RCCBs shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current	[ms]	--
		G1 - G2 - G3 -	N/A
	Verification of RCCBs after subclause: **Test sequence G_1, 9.Z.1 Verification of correct operation at low ambient air temperature of RCCBs for use in the range of -25°C to +40°C**		--
9.2.4	Verification of the RCCB after test sequences Only applicable for RCCBs of type B:		--
	2 pole RCCBs shall trip with the composite residual test current $I_{\Delta 2}$ as specified in Table 3		N/A
	$I_{\Delta 2}$:		N/A
	I_1: 3 $I_{\Delta n}$ smooth dc		N/A
	I_2: 2,25 x $I_{\Delta n}$ peak (half wave sinusoidal)		N/A
	break time ..... max. 0,3 s:	[ms]	--

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Clause	Requirement + Test	Result - Remark	Verdict
		G1 - G2 - G3 -	N/A
	3 and 4 pole type RCCBs shall trip with a test current of 2,5 $I_{\Delta n}$ with smooth direct current	[ms]	--
		G1 - G2 - G3 -	N/A

	Special national conditions acc EN 61008-1:	--
Germany, Switzerland	The use of RCCBs of type AC is not permitted	N/A
Ireland	EN 61008-1 (referred to as Part 1) is applicable with the following modifications:	N/A
	For RCCBs functionally dependant on the line voltage IEC 61008-2-2 applies in conjunction with Part 1	N/A

Modify or add the following items in table C1:

ANNEX C (NORMATIVE)

Number of samples to be submitted and test sequences to be applied for verification of conformity for Type B RCCBs

Table C.1 - Test sequences

Test sequence		Clause or subclause acc. to EN 61008-1 and EN 61008-2-1	Additional tests acc. to EN 62423	Test (or inspection)
D	D_0	9.9 --- --- ---	No 9.1.2 9.1.3 9.2.1.7.1 9.2.1.8	Residual operating characteristics Verification of the correct operation in case of steady increase of composite residual current Verification of the correct operation in case of sudden appearance of composite residual current Verification of the correct operation of 3 and 4 pole type B RCCB in case of residual smooth direct current without load for ratings of $I_{\Delta n}$ not tested in D_1 Verification of correct operation of 2 pole type B RCCB in case of residual currents when protecting a single phase inverter circuit connected to the supply

	MODIFY ANNEX E ROUTINE TESTS FOR TYPE F AND B RCCBS		--
E.1	Tripping test		N/A
	An alternating residual current is passed through each pole of the Type F or Type B RCCB or the Type F or Type B RCBO, as applicable, in turn. The RCCB or the RCBO, as applicable, shall not trip at a current less than or equal to 0,5 IΔn, but it shall trip at IΔn within a specified time (see Table 1 of IEC 61008-1 or Table 2 of IEC 61009-1, as applicable).		N/A
	The test current shall be applied at least five times on each sample and shall be applied at least twice on each pole.		N/A

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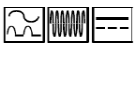
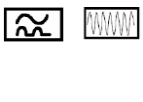
Clause	Requirement + Test	Result - Remark	Verdict
	In case of 3 or 4 pole RCCBs: A residual smooth direct current is passed through one pole. The Type B RCCB or the Type B RCBO, as applicable, shall not trip at a current less than or equal to 0,5 IΔn, but it shall trip at 2 IΔn within a specified time (see Table 1 of this standard).		N/A
	In case of 2 pole RCD a d.c residual current composed by a smooth d.c. current having the value I and a half wave pulsating residual current with power frequency and having the peak value of – 0,75 I is passed through one pole. The type B RCCB or type B RCBO, as applicable, shall not trip at a current less than or equal to the value specified for $I_{\Delta n1}$ and shall trip at the current $I_{\Delta n2}$ within the time specified in Table 3.		N/A
	The test current shall be applied at least twice on each sample.		N/A
E.2	Electric strength test		N/A
	Clause D.2 of IEC 61008-1 or IEC 61009-1 applies as applicable.		N/A
E.3	Performance of the test device		N/A
	Clause D.3 of IEC 61008-1 or IEC 61009-1 applies as applicable.		N/A

	ANNEX ZC A-deviations	--
Austria	subclause 4.1, Table Z1 is not valid in Austria	N/A

EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

Table Z3 – Requirements for marking

		Marking on the RCCB itself			Product information in the catalogue
	Each RCCB shall be marked in a durable manner with all or, for small apparatus, part of the following data: The minimum requirements are indicated by the symbol "X"	If, for small devices the space available does not allow all the data to be marked, at least the following information shall be marked and **visible** when the device is installed.	The following information may be marked on the **side** or on the back of the device and be visible only before the device is installed.	Alternatively the following information may be on the inside of any **cover** which has to be removed in order to connect the supply wires.	Any remaining information not marked shall be given in the manufacturer's **catalogues**.
a)	The manufacturer's name or trademark		X		
b)	Type designation, catalogue number or serial number		X		
c)	Rated voltage(s) with the symbol ~		X		
d)	Rated frequency, if the RCCB is designed for frequencies other than 50Hz		X		
e)	rated current	X			
f)	Rated residual operating current ($I_{\Delta n}$) in A or in mA	X			
h)	rated making and breaking capacity (I_m)				X (*)
j)	The degree of protection (only if different from IP20)				X
k)	The position of use (symbol according to IEC 60051), if necessary		X		
l)	Rated residual making and breaking capacity ($I_{\Delta m}$), if different from rated short-circuit capacity (I_m)				X (*)
m)	The symbol S (S in a square) for type S devices	X			
n)	symbol of the method of operation according to Table Z1 of 4.1 if the RCCB is functionally dependent on the line voltage		X	X	
o)	Operating means of the test device, by the letter T (**)	X			
p)	Wiring diagram unless the correct mode of operation is evident		X	X	
r)	Operating characteristic in presence of residual currents with d.c. components				
	- RCCBs of type B with the symbol  or		X		
	- RCCBs of type F with the symbol  or	X			
s)	RCCBs according to 4 Z2 marked with the symbol (snowflake enclosing -25)		X		
t)	Indication of the terminal for the neutral with "N"		X		
u)	Additional marking of performance to other standards or additional requirements according to 6.Z2		X		

*) $I_{\Delta m}$ and I_m (if different of $I_{\Delta m}$) may be anywhere on the device or in the catalogue but shall be together

**) It is recommended to advise the user to test the device regularly

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Clause	Requirement + Test	Result - Remark	Verdict

	Appendix ZZ	
	AS/NZS 61008.1:2015 Variations to IEC 61008-1 Ed.3.2 (2013) for application in Australia and New Zealand	

ZZ1	INTRODUCTION		--
	Variations to IEC 61008-1 Ed.3.2 (2013) form the Australian/New Zealand variations for the purposes of the IECEE Scheme for recognition of testing to standards for safety of electrical equipment (the CB Scheme). These variations are listed in this Annex for easy reference and will be published in the CB bulletin.		--
ZZ2	VARIATIONS		--
	Introduction		--
	Delete existing text and replace following:		--
	This part includes definitions, requirements and tests covering all types of RCCBs.		
3.3	Add the following definition		--
3.3.22	RCCB type 1		--
	A type A RCCB with a maximum rated residual current of ≤0,01 A, which complies with the requirements for type 1 in Table 1.1 and Table 2.1.		N/A
4.4	Delete Clause 4.4 and replace with the following:		--
	According to the possibility of adjusting the residual operating current – have a single fixed value of rated residual operating current		P
5.2.3	Delete Clause 5.2.3 and replace with the following:		
	Rated residual operating current (IΔn)		--
	The value of residual operating current (see 3.2.4), assigned to the RCCB by the manufacturer, at which the RCCB shall operate under specified conditions.		P
	RCCBs shall have a single fixed value of rated residual operating current.		P
5.3.1	After the Note insert the following:		--
	The marking of the rated voltage, or rated voltage range, of single phase circuit breakers shall cover 240 V for Australia and 230 V for New Zealand, and for multiphase circuit-breakers, 415 V for Australia and 400 V for New Zealand.	Australia: 240V~ for single phase 415V~ for multi phases New Zealand: 230V~ for single phase 400V~ for multi phases	P
5.3.3	After the Note insert the following:		--
	RCCBs with a rated residual current of ≤0,01A shall be type 1 and comply with type 1 and type A characteristics requirements in Table 1 and Table 2.		N/A

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Clause	Requirement + Test							Result - Remark				Verdict
	Exception - If an RCD with a rated residual current of ≤0,01A is not type 1, but is of the 'general' type in Table 1.1 and Table 2.1, then it shall be marked in accordance with 6(f).											N/A
Table 1	Delete Table 1 and replace with the following:											--
	Table 1 — Limit values of break time and non-actuating time(s) for alternating residual currents (r.m.s. values) for type AC and A RCCB											--
				Limit values of break time and non-actuating time(s) for residual currents (r.m.s. values) equal to								--
	Type	I_n	$I_{\Delta n}$	$I_{\Delta n}$	2 $I_{\Delta n}$	5 $I_{\Delta n}$ or 0,25A[a]	5, 10, 20, 50, 100, 200, 500A[b]					--
	General	Any	<0,03	0,3	0,15	0,04	0,04	Max. break times				--
			0,03	0,3	0,15	0,04	0,04					--
			>0,03	0,3	0,15	0,04[c)]	0,04					--
	S	≥25	>0,03	0,5	0,2	0,15[c)]	0,15					--
			>0,03	0,13	0,06	0,05[c)]	0,04	Minimum non-actuating times				--
	a) value to be decided by the manufacturer for this test.											--
	b) The tests are only made during the verification of the correct operation as mentioned in 9.9.2.4.											--
	c) Only test for 5 $I_{\Delta n}$											
Table 1.1	Add the following new Table 1.1.											--
	Table 1.1 – Limiting values of break time for alternating residual currents (r.m.s. values) for type 1 RCCB											--
				Limit values of break time(s) for type 1 RCCB in event of alternating residual currents (r.m.s. values) equal to								--
	Type	I_n	$I_{\Delta n}$	$I_{\Delta n}$	2 $I_{\Delta n}$	5 $I_{\Delta n}$ or 0,25A[a]	5, 10, 20, 50, 100, 200, 500A[b]					--
	1	Any	≤0.01	0,04	0,04	0,04	0,04	Max. break times				--
	a) value to be decided by the manufacturer for this test.											--
	b) The tests are only made during the verification of the correct operation as mentioned in 9.9.2.4.											--
Table 2.1	Add the following new Table 2.1.											--
	Table 2.1 – Maximum values of break time for half-wave pulsating residual currents (r.m.s. values) for type 1 RCCB											--
				Maximum values of break time(s) for type 1 RCCB in event of half-wave pulsating residual currents (r.m.s. values) equal to								--
	Type	I_n	$I_{\Delta n}$	1,4$I_{\Delta n}$	2 IΔn	2,8 $I_{\Delta n}$	4 $I_{\Delta n}$	7 $I_{\Delta n}$	0,35A	0,5A	350A	--
	1	Any	≤0.01		0,04		0,04			0,04	0,04	--
6	Delete item a) and replace with the following:											--
a)	name, registered trade name, or mark of the manufacturer, or of the responsible vendor;							HONI®				P
c)	Add the following Note after item c):											--

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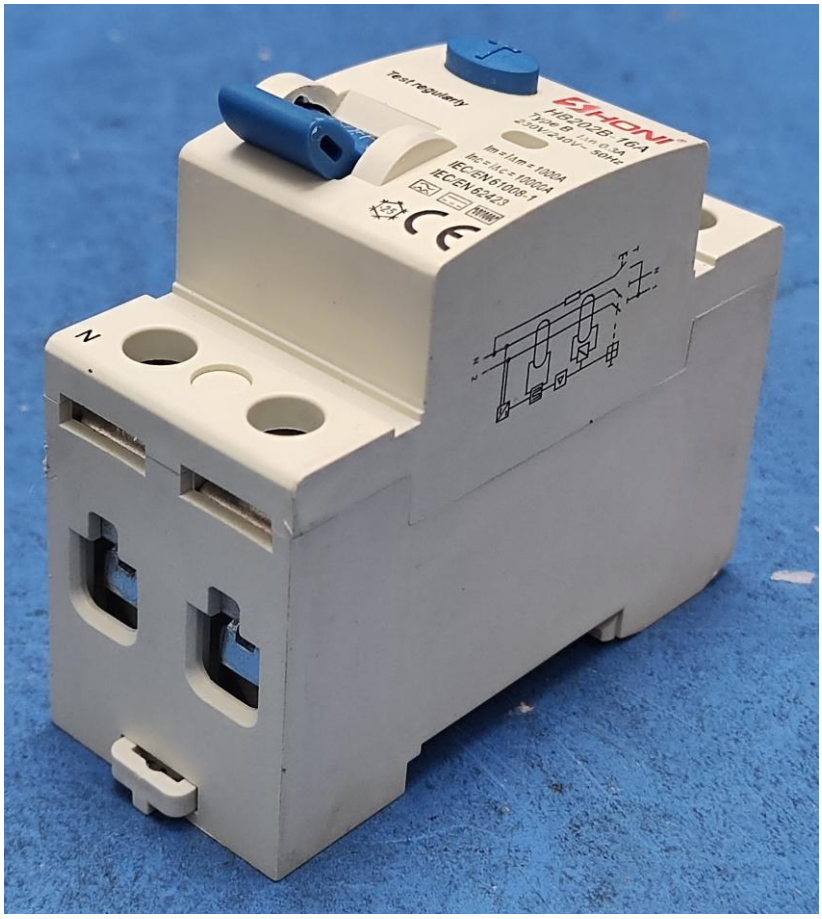
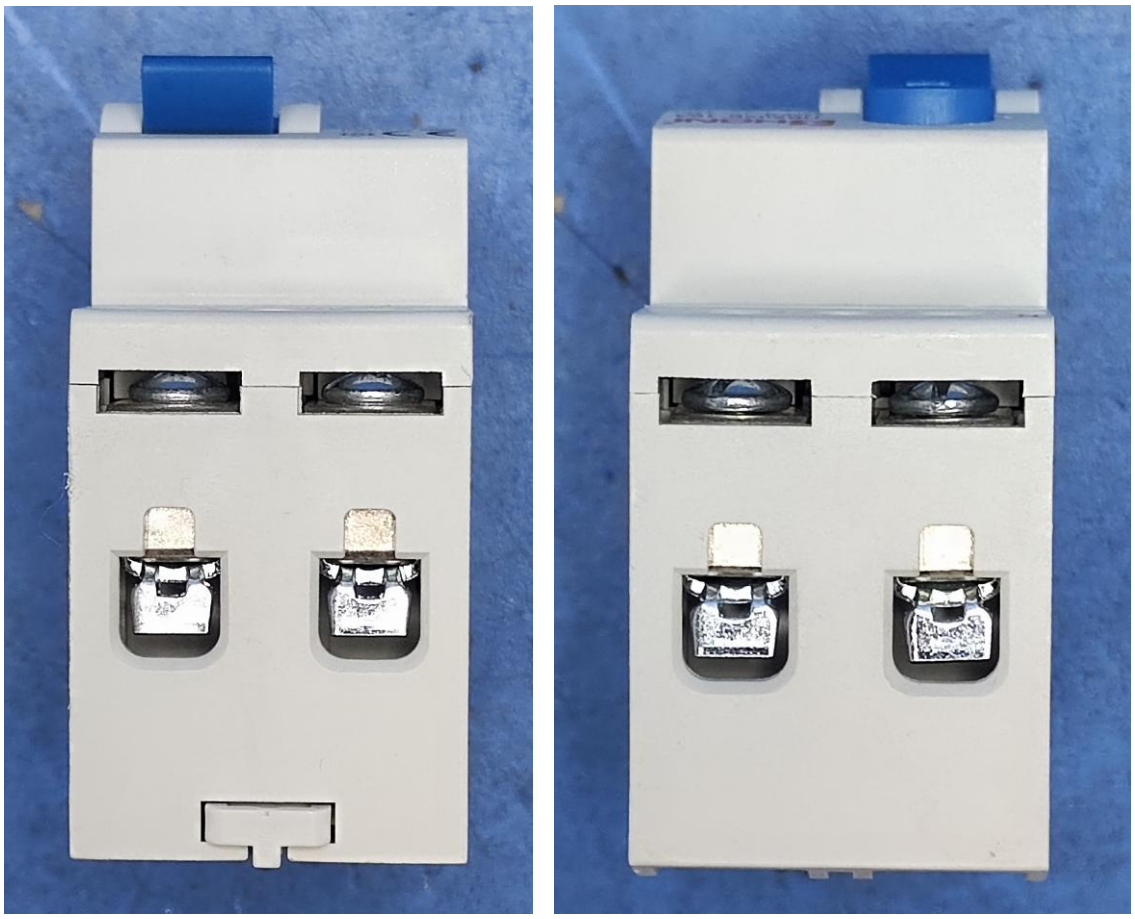
Clause	Requirement + Test	Result - Remark	Verdict
	NOTE Refer to 5.3.1 for specific requirements.		--
f)	Add the following sentence to item f):		--
	If an RCCB has a rating of ≤0.01 A and is of the general type in Table 1 and 2, and not Type 1 in Table 1.1 and 2.1, it shall be marked as 'GENERAL TYPE, NOT FOR PATIENT AREAS'.		N/A
g)	Delete item g).		--
8.1.1	Delete Clause 8.1.1 and replace with the following:		
	The residual current detection and the residual current release shall be located between the incoming and outgoing terminals of the RCCB.		P
	RCCBs shall have a single fixed value of rated residual operating current.		P
	It shall not be possible to disable or inhibit the RCCB function by any means		P
8.1.4.4	Add the following new last paragraph:		--
	Compliance is checked by inspection and, if necessary, by chemical analysis.		P
8.11	Delete paragraph 4 and replace with the following paragraph and Notes 1 and 2:		
	The protective conductor of the installation shall not become live (see Note 1) when the test device is operated.		--
	It shall not be possible to energize (see Note 2) the circuit on load side by operating the test device when the RCCB is in the open position and connected as in normal use.		--
9.9.2.4	Delete clause 9.9.2.4 and replace with the following:		
	The test circuit ia calibrated successively to the following values of the residual current: 5A, 10A, 20A, 50A, 100A, 200A and 500A		P
	The break time shall not exceed the times given in Table 1 and table 1.1.		P
9.22.1.3	Delete item (b)(1) and replace with the following item and Note:		--
	1) The RCCB in the closed position, mounted, wired and energised as for normal use, is introduced into the chamber.		P
	Note: it is permissible to energy only those parts required for the operation of the RCD.		--

AS/NZS 61008.1			
Clause	Requirement + Test	Result - Remark	Verdict
	AS/NZS 61008.1-2015 **Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs), Part 1: General rules** **(IEC 61008-1, ED. 3.2 (2013) MOD)** **Amendment No.1**		--
	Summary This Amendment applies to the following element: **Clause ZZ2**		--
	Amendment Details **AS/NZS 61008.1:2015 is amended as follows. The amendments should be inserted in the locations as instructed.**		--
ZZ2	1. After modification to Introduction, add the following:		--
Cl 1	1. Delete NOTE 5		--
	2. After the last paragraph, add the following: For portable RCCBs, refer to AS/NZS 3190. This standard only applies to RCCBs for fixed installation and fixed wiring		P
	2. Delete modification to Clause 5.3.1 and replace with the following:		--
Cl 5.3.1	After the Note, add the following: The marking of the rated voltage for single-phase RCCBs shall be 110V or 230V or 240V or 230/240V. The marking of the rated voltage for multi-phase RCCBs shall be 190V or 400V or 415V or 400/415V		P
	3. After modification 4 of Clause 6, add the following:		--
	After the last paragraph of Clause 6, add the following: For RCCBs that have a rated voltage marking of 110V or 190V, the following statement shall be included in the manufacturer's literature: "This device is for use in speciality applications such as mining. It is not intended to be used in domestic installations."		N/A
	4. After modification to Clause 9.9.2.4, add the following:		--
Cl 9.9.4	After the first sentence, add the following: For test purposes:		--
	(a) For single phase RCCBs, if marked with a rated voltage of “230V”, “240V” or “230/240V” test - (i) at 0,8 x 230V; and (ii) at 1,1 x 240V		P
	(b) For multi-phase RCCBs, if marked with a rated voltage of “400V”, “415V” or “400/415V” test - (i) at 0,8 x 400V; and (ii) at 1,1 x 415V		P
	(c) If marked with voltages other than the above, then test - (i) at 0,8 x the lowest marked voltage; and (ii) at 1,1 x the highest marked voltage		N/A

Photos of sample: 1P+N



Photos of sample: 1P+N



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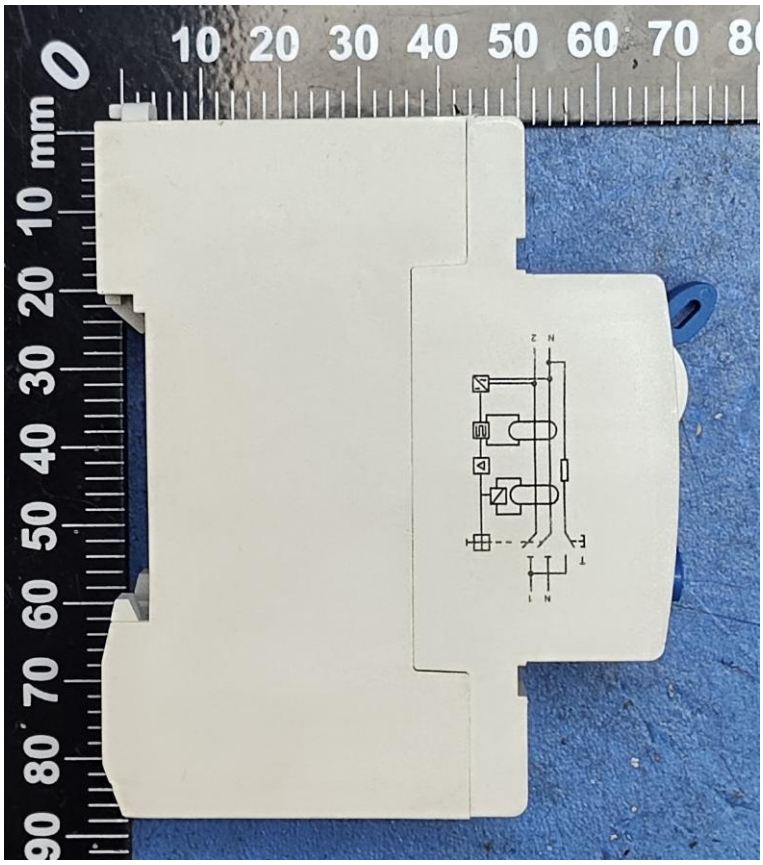

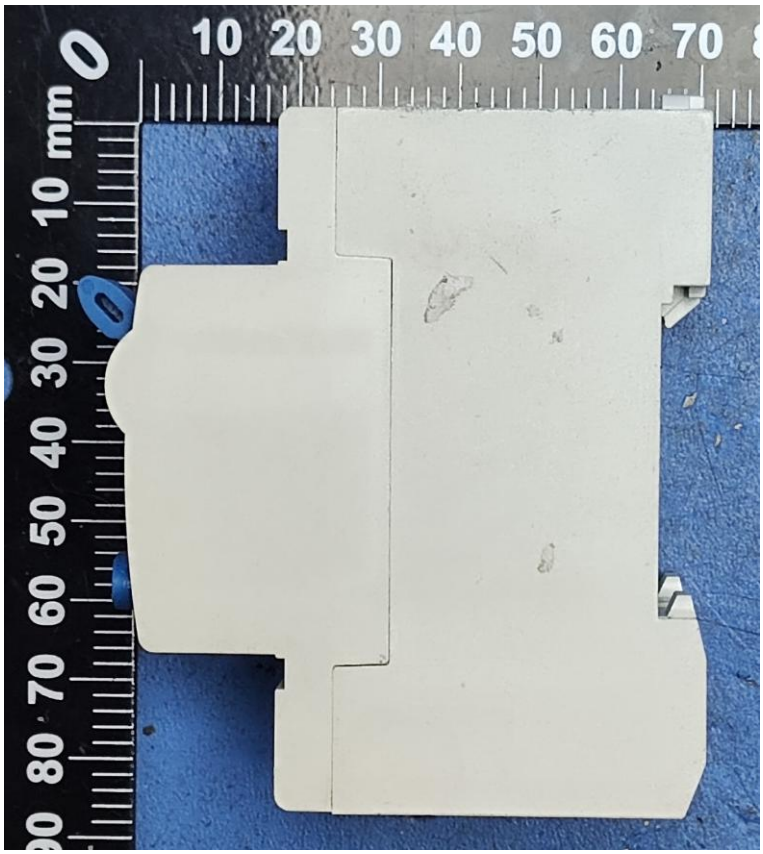

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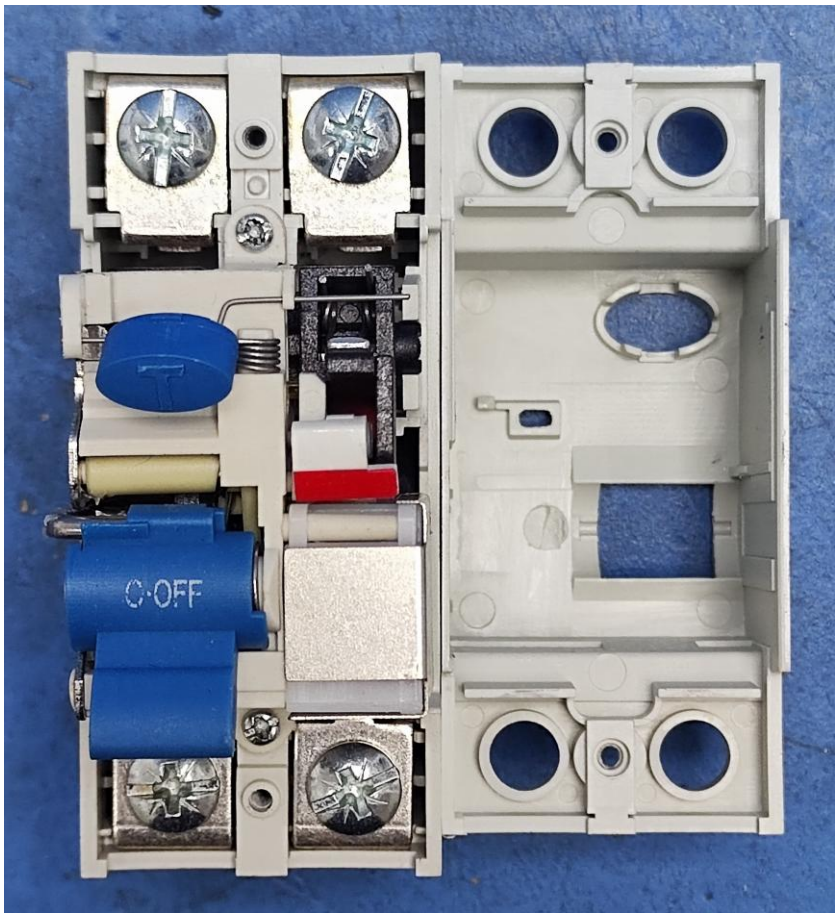
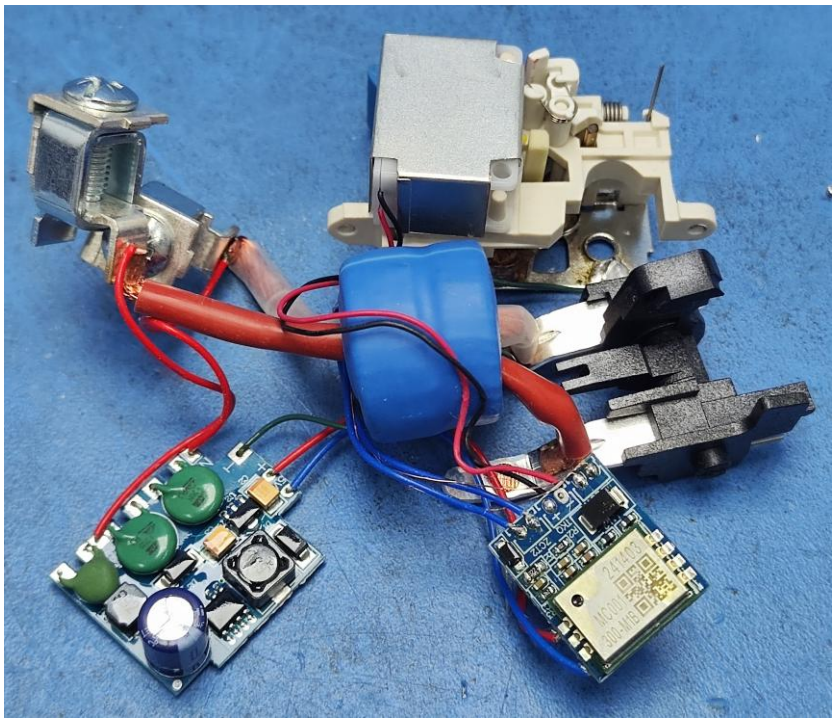
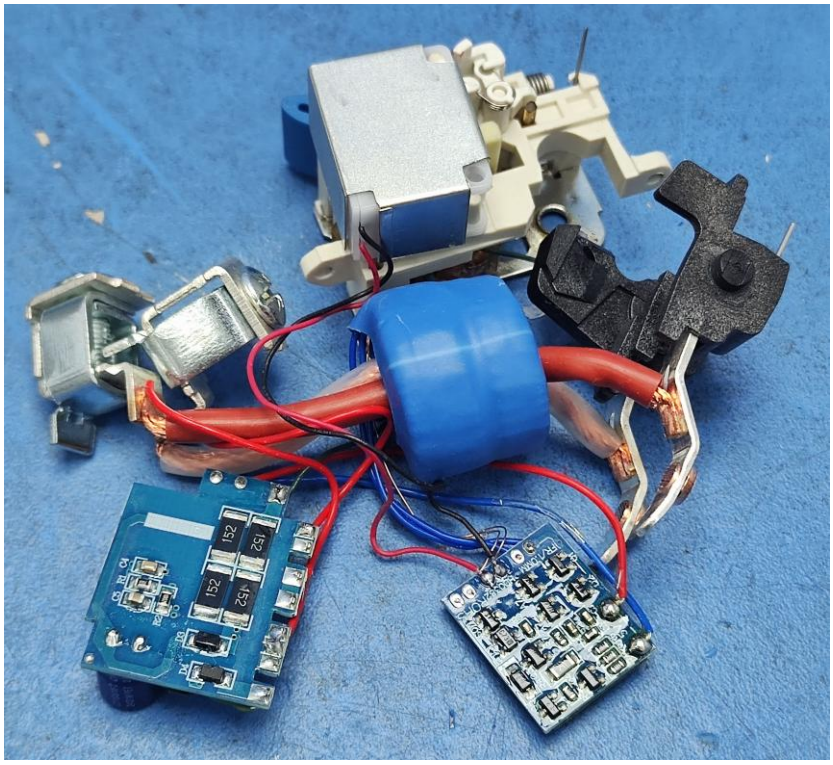
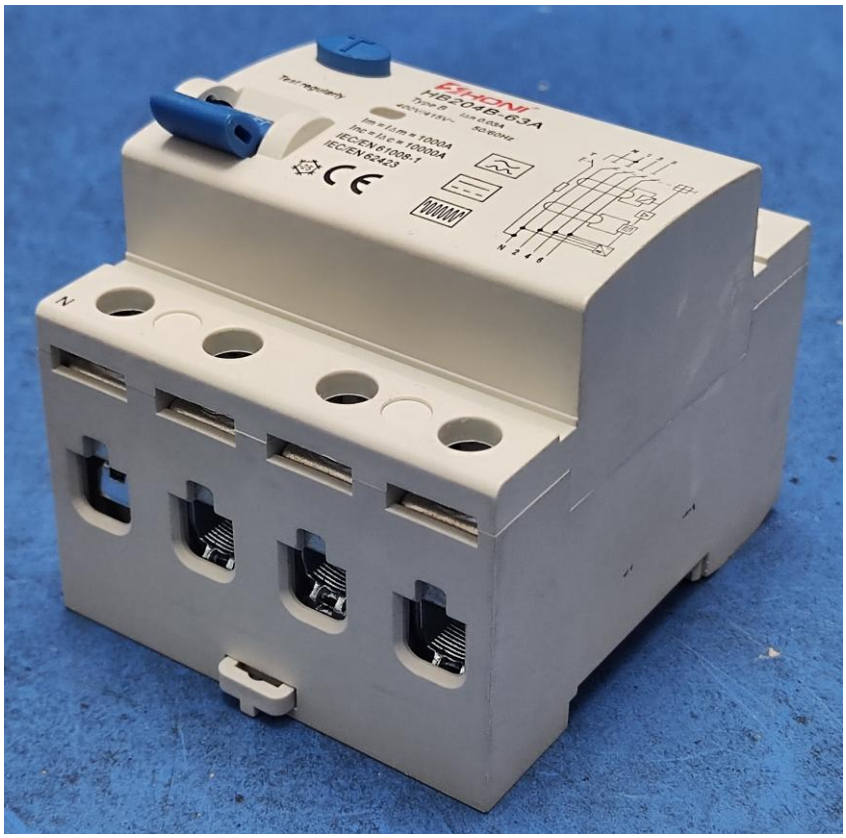


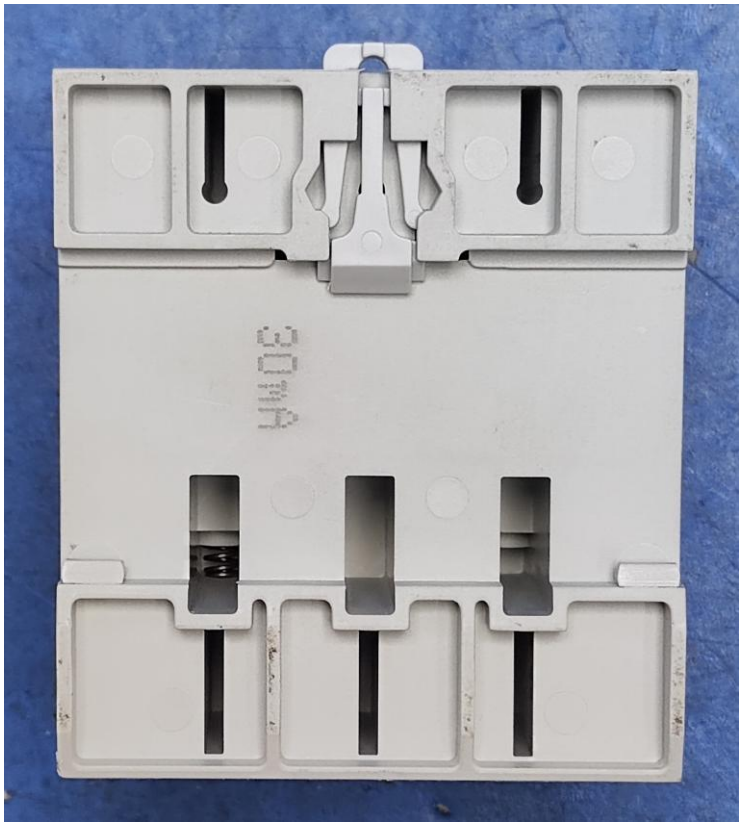
Photos of sample: 1P+N





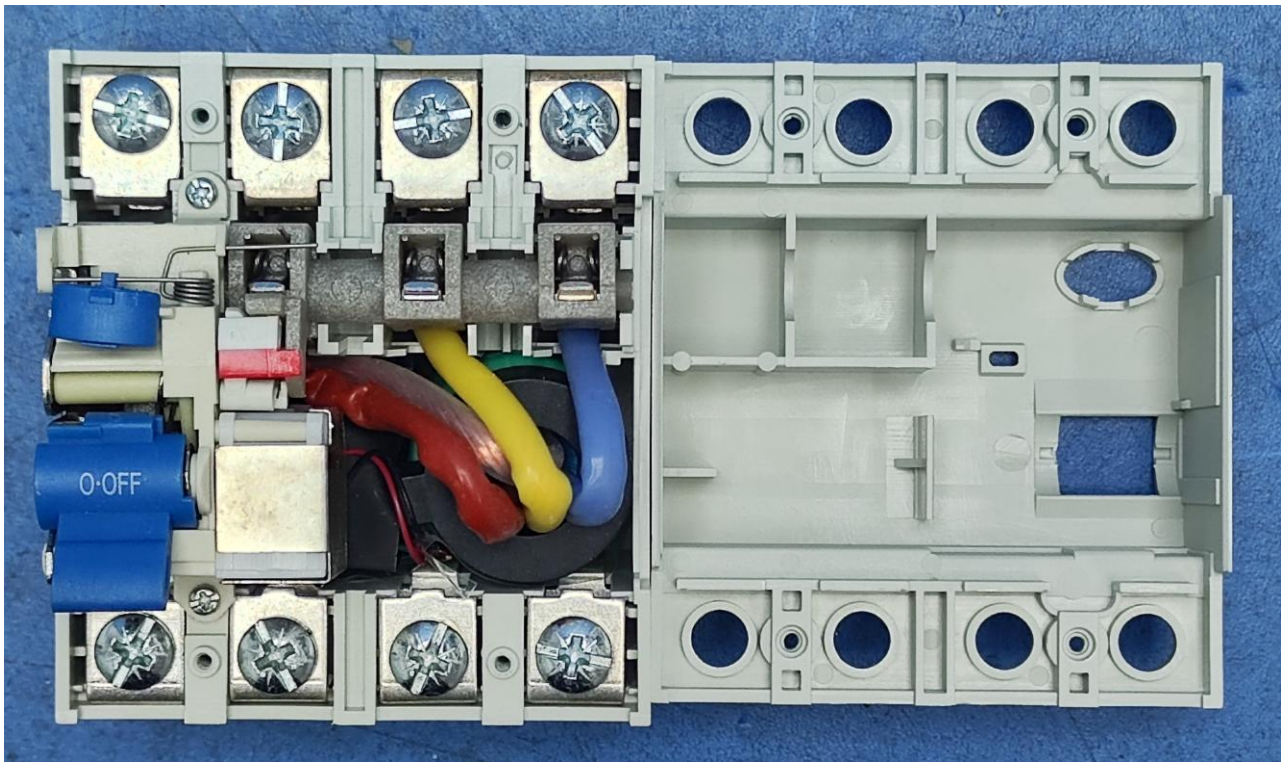
Photos of sample: 3P+N





Photos of sample: 3P+N

Photos of sample: 3P+N



Photos of sample: 3P+N