

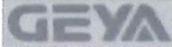


Test Report issued under the responsibility of:



L C I E

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	24119Y90016
Date of issue	2024-07-25
Total number of pages	288
Applicant's name	ZHEJIANG GEYA ELECTRICAL CO., LTD
Address	WENZHOU BRIDGE INDUSTRIAL ZONE, BEIBAIXIANG TOWN, YUEQING, ZHEJIANG, 325603 - 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
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General disclaimer:	
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Test item description		Type B RCCB
Trade Mark		
Manufacturer		ZHEJIANG GEYA ELECTRICAL CO., LTD WENZHOU BRIDGE INDUSTRIAL ZONE, BEIBAIXIANG TOWN, YUEQING, ZHEJIANG, 325603 - CHINA
Model/Type reference		GYL9
Ratings		poles: 1P+N,3P+N Ue: 240V(1P+N),415V (3P+N) In: 16A,25A,40A,63A,80A I _{Δn} : 30mA, 100mA, 300mA Inc= I _{Δc} : 10kA
Testing procedure and testing location:		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	Zhejiang Fangyuan Test Group CO., Ltd.
Testing location/ address		Guangqiong Rd, Jiaxing City, Zhejiang Province. P.R. China
Tested by (name, function + signature)		Xu Shengjie- Testing engineer <i>XuShengjie</i>
Approved by (name, function + signature) ... :		Lu Linlin- Testing manager <i>LuLinlin</i>
<input type="checkbox"/>	Testing procedure: CTF Stage 1	
Testing location/ address		
Tested by (name, function + signature)		
Approved by (name, function + signature) ... :		
<input type="checkbox"/>	Testing procedure: CTF Stage 2	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name, function + signature) .. :		
Approved by (name, function + signature) ... :		
<input type="checkbox"/>	Testing procedure: CTF Stage 3	
<input type="checkbox"/>	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):

Attachment N°1- EU_GD_IEC62423E_II (total 41 pages, from page 201 to 245)

Attachment N°2- EMC test of sequence H,I and J (total 29 pages, from page 253 to 282)

Summary of testing:

Standard used:

IEC 62423:2009 in conjunction with

IEC 61008-1:2010+A1:2012+A2:2013, IEC 61008-2-1:1990

EN 62423:2012+A11:2021+A12:2022 in conjunction with

EN 61008-1:2012 +A1:2014+A2:2014+A11:2015+A12:2017

EN 61008-2-1: 1994+A11:1998

- This is a new application of Type B RCCB.

- All the samples satisfy to the clauses examined.

Tests performed (name of test and test clause):

Model	poles	Type	Un(A)	In(A)	Idn(mA)	Test Sequences
GYL9	1P+N	B	240V	80A	30mA	A1,A2,B,C,D0+D1,D2,E,F,G0
GYL9	1P+N	B	240V	16A	300mA	F,G0
GYL9	1P+N	B	240V	80A	100mA	D0
GYL9	1P+N	B	240V	80A	300mA	D0
GYL9	3P+N	B	415V	80A	30mA	A1,A2,B,C,D0+D1,D2,E,F,G0,G1, H,I,J
GYL9	3P+N	B	415V	16A	300mA	F,G0,G1

Testing location: CBTL

Zhejiang Fangyuan Test Group CO.,

Ltd Testing location/ address: Guangqiong Rd, Jiaxing City, Zhejiang Province. P.R. China

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

CENELEC

The product fulfils the requirements of

EN 62423:2012+A11:2021+A12:2022 in conjunction with

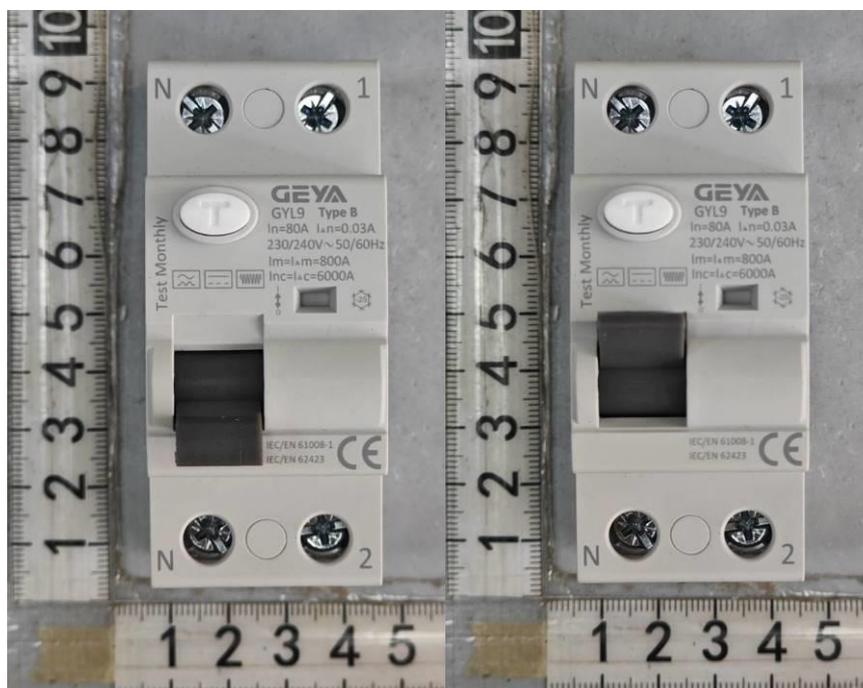
EN 61008-1:2012 +A1:2014+A2:2014+A11:2015+A12:2017

EN 61008-2-1: 1994+A11:1998

Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

1P+N 80A 30mA



3P+N 80A 30mA

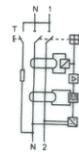
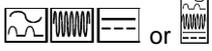
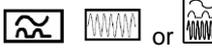


Test item particulars:	
Classification of RCCBs functionally dependent on the line voltage(Type A part)	No
Opening automatically in case of failure of the line voltage.....:	No
- reclosing automatically when the line voltage is restored	No
- not reclosing automatically when the line voltage is restored	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	No
- not able to trip in a hazardous situation arising on failure of line voltage	No
Type of RCCB.....:	
- type (A)/ B	Yes
- type (A)/ F	No
- independent of the line voltage(Type A part).....:	Yes
- dependent on the line voltage(Type B part)	Yes
- without time delay	Yes
- with time delay: type S.....:	No
- enclosed.....:	No
- unenclosed.....:	Yes
- IP number	IP20
- for fixed installation	Yes
- for mobile installation.....:	No
Number of poles.....:	1P+N, 3P+N
Ambient air temperature (°C)	-25 °C to +40°C
Method of mounting	On rail
Method of connection	Not associated with the mechanical mounting
Rated residual operating current (A)	30mA, 100mA, 300mA
Rated current (A)	16A,25A,40A,63A,80A
Rated voltage (V)	240V~ for 1P+N; 415V~ for 3P+N
Rated impulse withstand voltage (U_{imp})	4kV
Nature of supply	AC
Rated frequency (Hz).....:	50/60Hz

Rated making and breaking capacity (A).....:	10In(In=63A,80A) , 500A(In=16A,25A,40A)
Rated residual making and breaking capacity (A).....:	10In(In=63A,80A), 500A(In=16A,25A,40A)
Rated conditional short-circuit current (A).....:	10kA
Rated conditional residual short-circuit current (A).....:	10kA
Type of terminal.....:	Pillar terminal
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.....:	2024-05-16
Date (s) of performance of tests.....:	2024-05-18 to 2024-07-13
General remarks:	
<p>“(see Enclosure #)” refers to additional information appended to the report. “(see appended table)” refers to a table appended to the report.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p>	
Manufacturer’s Declaration per sub-clause 4.2.5 of IEC 60947-2:	
<p>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.....:</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable</p>	
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies).....:	ZHEJIANG GEYA ELECTRICAL CO., LTD WENZHOU BRIDGE INDUSTRIAL ZONE, BEIBAIXIANG TOWN, YUEQING, ZHEJIANG, 325603 - CHINA
General product information:	
<p>1P+N , 3P+N(neutral on left) 240V (1P+N);415V(3P+N) In: 16A,25A,40A,63A,80A IΔn: 30mA, 100mA, 300mA Inc =IΔc = 10000A Grid distance = 50mm Ui= 500V Uimp=4kV Material group=IIIa Screw diameter=M6 50/60Hz</p>	

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE A₁ (1 sample) I_n=80A I_{Δn} =30mA 1P+N , B type	A₁-1	--
--	--	------------------------	-----------

6.	Marking		--
	a) manufacturer's name or trademark		P
	b) type designation, catalogue number or serial number	GYL9	P
	c) rated voltage(s) (V)	230/240V~	P
	d) rated frequency (Hz)	50/60Hz	P
	e) rated current (A)	80A	P
	f) rated residual operating current (A)	0,03A	P
	h) rated making and breaking capacity (A)	800A	P
	j) degree of protection		N/A
	k) position of use		N/A
	l) rated residual making and breaking capacity (A)	800A	P
	m) symbol S for type S		N/A
	n) symbol of the method of operation		N/A
	o) operating means of test device	T	P
	p) wiring diagram		P
	q) operating characteristic:	Type B	P
	- 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 :	Applied	P
	Joule integral withstand capacity (A ² s)		N/A
	Peak current withstand capacity (A)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Time delay when opening in case of failure of the line voltage (s)		N/A
	Open position indicated by "0" and closed position by "1"	O / I	P
	For push-buttons the OFF push-button shall either be red or marked with "O"		N/A
	If necessary to distinguish between supply and load terminals they shall be clearly marked		P
	Terminals for neutral conductor marked by "N"	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:		P
	- no markings		P
	For non-universal terminals:		N/A
	- 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		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	In case of an RCCB having multiple settings of residual operating current the rating refers to the highest 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
	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		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:		P
	- 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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	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		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		N/A
	The indicator light shall not be the only means to indicate the closed position		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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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
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):	2,5Nm; 5 times; Ø M6	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).		P
	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		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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:		P
	- torque (Nm); diameter (mm)	2,5Nm; Ø M6	P
	- max. cross-sectional area (mm ²)	25 mm ²	--
9.5.1	Pull test:		P
	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 (mm ²):	1mm ² /1,5mm ² /1mm ²	--
	Max. cross-section solid / stranded / flexible (mm ²):	6mm ² /25mm ² /16mm ²	--
	Torque ² / ₃ (Nm)	1,70Nm	--
	Pull for 1 min solid / stranded / flexible (N) ...	N	
	During the test no noticeable move of conductor	Min. cross-section 50/50/50N Max.cross-section 60/100/90N	
9.5.2	Torque test:		
	- torque (2/3) (Nm)	1,70 Nm	--
	- min. cross-sectional area (mm ²)	1 mm ²	--
	- max. cross-sectional area (mm ²)	25 mm ²	--
	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 (mm ²)	25 mm ²	--
	Max. cross-section flexible (mm ²)	16 mm ²	--
	Torque ² / ₃ (Nm)	1,70Nm	--
	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																													
	<table border="0"> <tr> <td rowspan="2">Rated current (A)</td> <td colspan="2">Range of nominal cross sections to be clamped* (mm²)</td> </tr> <tr> <td>Rigid (solid or stranded) conductors</td> <td>Flexible conductors</td> </tr> <tr> <td>≤ 13</td> <td>1 to 2,5</td> <td>1 to 2,5</td> </tr> <tr> <td>> 13 ≤ 16</td> <td>1 to 4</td> <td>1 to 4</td> </tr> <tr> <td>> 16 ≤ 25</td> <td>1,5 to 6</td> <td>1,5 to 6</td> </tr> <tr> <td>> 25 ≤ 32</td> <td>2,5 to 10</td> <td>2,5 to 6</td> </tr> <tr> <td>> 32 ≤ 50</td> <td>4 to 16</td> <td>4 to 10</td> </tr> <tr> <td>> 50 ≤ 80</td> <td>10 to 25</td> <td>10 to 16</td> </tr> <tr> <td>> 80 ≤ 100</td> <td>16 to 35</td> <td>16 to 25</td> </tr> <tr> <td>> 100 ≤ 125</td> <td>24 to 50</td> <td>25 to 35</td> </tr> </table>	Rated current (A)	Range of nominal cross sections to be clamped* (mm ²)		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	<p>Solid 1,0mm² to 6mm²</p> <p>Stranded 1,5mm² to 25mm²</p> <p>Flexible 1,0mm² to 16mm²</p>	P
Rated current (A)	Range of nominal cross sections to be clamped* (mm ²)																															
	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																														
	*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 mm ² up to 6 mm ² 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 $I_n \leq 32$ A allow the connection of conductors without special preparation		N/A																													
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																													

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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
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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Possible to replace plug-in RCCBs easily without touching live parts		N/A
	Lacquer or enamel not considered to provide adequate insulation		P
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 / 1h	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	5,0N	P
	The RCCB shall trip with a test current of 1,25 I _{Δn} :	trip	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 _{Δn} with smooth direct current maximum break time (ms)	42ms	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	125 °C / 1 h 1,1mm	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	70 °C / 1 h 0,7mm	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

IEC 62423				
Clause	Requirement + Test	Result - Remark		Verdict
	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
	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.			N/A
	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:			N/A
	- 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			N/A
	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			N/A
	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			P
	Clearances [mm] U_{imp}			--
	4kV (see table 5) 2,5kV(see table 5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	--
	Minimum clearances (see table 5)			--
		minimum clearances [mm]	measure clearances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	4,0	4,42	P
	2. between live parts of different polarity	3,0	10,1	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	3,0	16,8	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB	-	-	N/A

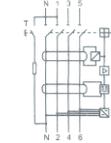
IEC 62423				
Clause	Requirement + Test	Result - Remark		Verdict
	- surface on which the RCCB is mounted	3,0	17,2	P
	- screws or other means for fixing the RCCB	3,0	--	N/A
	- metal covers or boxes	3,0	--	N/A
	- other accessible metal parts	3,0	--	N/A
	- metal frames supporting flush-type RCCBs	3,0	--	N/A
	Minimum creepage distances (see table 5)			--
	Material group	IIIb <input type="checkbox"/>		P
		IIIa <input checked="" type="checkbox"/>		
		II <input type="checkbox"/>		
		I <input type="checkbox"/>		
		minimum creepage distances [mm]	measure creepage [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	4,0	24,6	P
	2. between live parts of different polarity	3,0	10,7	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	4,0	26,2	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB	4,0	--	N/A
	- surface on which the RCCB is mounted	4,0	24,5	P
	- screws or other means for fixing the RCCB	4,0	--	P
	- metal covers or boxes	4,0	--	N/A
	- other accessible metal parts	4,0	--	N/A
	- metal frames supporting flush-type RCCBs	4,0	--	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	20°C		P
	- 10 min in a box containing air saturated with moisture at 20°C±5°C	20°C		P
	- 10 min at 100°C			P
	No sign of rust	No sign of rust		P

	TEST SEQUENCE A₂ (3 samples)	A₂-1	A₂-2	A₂-3	P
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IEC 62423					
Clause	Requirement + Test	Result - Remark			Verdict
8.10	Resistance to abnormal heat and fire				P
	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				P
	Test performed on a complete RCCB				P
	Glow-wire test: (960 + 15) °C for external parts of insulating material retaining current-carrying parts or parts of the protective circuit in position	960°C	961°C	961°C	P
	Glow-wire test: (650 + 10) °C for all other external parts insulating material	650°C	650°C	650°C	P
	No visible flames, no sustained glowing, or				P
	flames and glowing extinguish within 30 s after removal				P
	No ignition of tissue paper or scorching of the pinewood board				P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE A₁ (1 sample) I_n=80A I_{Δn} =30mA , 3P+N , B type	A₁-2	--
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6.	Marking		--
	a) manufacturer's name or trademark		P
	b) type designation, catalogue number or serial number	GYL9	P
	c) rated voltage(s) (V)	400/415V~	P
	d) rated frequency (Hz)	50/60Hz	P
	e) rated current (A)	80A	P
	f) rated residual operating current (A)	0,03A	P
	h) rated making and breaking capacity (A)	800A	P
	j) degree of protection		N/A
	k) position of use		N/A
	l) rated residual making and breaking capacity (A)	800A	P
	m) symbol S for type S	S	N/A
	n) symbol of the method of operation		N/A
	o) operating means of test device	T	P
	p) wiring diagram		P
	q) operating characteristic:	Type B	P
	- RCBOs of type B with the symbol   or 	Applied	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 :	Applied	P
	Joule integral withstand capacity (A ² s)		N/A
	Peak current withstand capacity (A)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Time delay when opening in case of failure of the line voltage (s)		N/A
	Open position indicated by "0" and closed position by "1"	O / I	P
	For push-buttons the OFF push-button shall either be red or marked with "O"		N/A
	If necessary to distinguish between supply and load terminals they shall be clearly marked		N/A
	Terminals for neutral conductor marked by "N"	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:		P
	- no markings		P
	For non-universal terminals:		N/A
	- 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		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	In case of an RCCB having multiple settings of residual operating current the rating refers to the highest 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
	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		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:		P
	- 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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	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		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		N/A
	The indicator light shall not be the only means to indicate the closed position		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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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
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):	2,5Nm; 5 times; Ø M6	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).		P
	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		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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:		P
	- torque (Nm); diameter (mm)	2,5Nm; Ø M6	P
	- max. cross-sectional area (mm ²)	25 mm ²	--
9.5.1	Pull test:		P
	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 (mm ²):	1mm ² /1,5mm ² /1mm ²	--
	Max. cross-section solid / stranded / flexible (mm ²):	6mm ² /25mm ² /16mm ²	--
	Torque ² / ₃ (Nm)	1,70Nm	--
	Pull for 1 min solid / stranded / flexible (N) ...	N	
	During the test no noticeable move of conductor	Min. cross-section 50/50/50N Max. cross-section 60/100/90N	
9.5.2	Torque test:		
	- torque (2/3) (Nm)	1,70 Nm	--
	- min. cross-sectional area (mm ²)	1 mm ²	--
	- max. cross-sectional area (mm ²)	25 mm ²	--
	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 (mm ²)	25 mm ²	--
	Max. cross-section flexible (mm ²)	16 mm ²	--
	Torque ² / ₃ (Nm)	1,70Nm	--
	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																											
	<p>Rated current (A) Range of nominal cross sections to be clamped* (mm²)</p> <table border="1"> <thead> <tr> <th></th> <th>Rigid (solid or stranded) conductors</th> <th>Flexible conductors</th> </tr> </thead> <tbody> <tr> <td>≤ 13</td> <td>1 to 2,5</td> <td>1 to 2,5</td> </tr> <tr> <td>> 13 ≤ 16</td> <td>1 to 4</td> <td>1 to 4</td> </tr> <tr> <td>> 16 ≤ 25</td> <td>1,5 to 6</td> <td>1,5 to 6</td> </tr> <tr> <td>> 25 ≤ 32</td> <td>2,5 to 10</td> <td>2,5 to 6</td> </tr> <tr> <td>> 32 ≤ 50</td> <td>4 to 16</td> <td>4 to 10</td> </tr> <tr> <td>> 50 ≤ 80</td> <td>10 to 25</td> <td>10 to 16</td> </tr> <tr> <td>> 80 ≤ 100</td> <td>16 to 35</td> <td>16 to 25</td> </tr> <tr> <td>> 100 ≤ 125</td> <td>24 to 50</td> <td>25 to 35</td> </tr> </tbody> </table>		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	<p>Solid 1,0mm² to 6mm² Stranded 1,5mm² to 25mm² Flexible 1,0mm² to 16mm²</p>	P
	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																												
	<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>		P																											
	<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.</p>		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 $I_n \leq 32$ A allow the connection of conductors without special preparation		N/A																											
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																											

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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
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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Possible to replace plug-in RCCBs easily without touching live parts		N/A
	Lacquer or enamel not considered to provide adequate insulation		P
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 / 1h	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	5,0N	P
	The RCCB shall trip with a test current of 1,25 I _{Δn} :	trip	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 _{Δn} with smooth direct current maximum break time (ms)	47ms	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	125 °C / 1 h 1,0mm	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	70 °C / 1 h 0,7mm	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

IEC 62423				
Clause	Requirement + Test	Result - Remark		Verdict
	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
	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.			N/A
	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:			N/A
	- 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			N/A
	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			N/A
	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			P
	Clearances [mm] U_{imp}			--
	4kV (see table 5) 2,5kV(see table 5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	--
	Minimum clearances (see table 5)			--
		minimum clearances [mm]	measure clearances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	4,0	4,46	P
	2. between live parts of different polarity	3,0	10,2	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	3,0	16,7	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB	3,0	--	P

IEC 62423				
Clause	Requirement + Test	Result - Remark		Verdict
	- surface on which the RCCB is mounted	3,0	17,1	P
	- screws or other means for fixing the RCCB	3,0	--	N/A
	- metal covers or boxes	3,0	--	N/A
	- other accessible metal parts	3,0	--	N/A
	- metal frames supporting flush-type RCCBs	3,0	--	N/A
	Minimum creepage distances (see table 5)			--
	Material group	IIIb <input type="checkbox"/>		P
		IIIa <input checked="" type="checkbox"/>		
		II <input type="checkbox"/>		
		I <input type="checkbox"/>		
		minimum creepage distances [mm]	Measure creepage distances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	4,0	24,6	P
	2. between live parts of different polarity	3,0	10,7	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	4,0	26,2	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB	4,0	--	N/A
	- surface on which the RCCB is mounted	4,0	24,5	P
	- screws or other means for fixing the RCCB	4,0	--	N/A
	- metal covers or boxes	4,0	--	N/A
	- other accessible metal parts	4,0	--	N/A
	- metal frames supporting flush-type RCCBs	4,0	--	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	20°C		P
	- 10 min in a box containing air saturated with moisture at 20°C±5°C	20°C		P
	- 10 min at 100°C			P
	No sign of rust	No sign of rust		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE A ₂ (3 samples) I _n =80A I _{Δn} =30mA 3P+N	A ₂ -4	A ₂ -5	A ₂ -6	P
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8.10	Resistance to abnormal heat and fire				P
	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				P
	Test performed on a complete RCCB				P
	Glow-wire test: (960 + 15) °C for external parts of insulating material retaining current-carrying parts or parts of the protective circuit in position	961 °C	961 °C	960 °C	P
	Glow-wire test: (650 + 10) °C for all other external parts insulating material	650 °C	651 °C	651 °C	P
	No visible flames, no sustained glowing, or				P
	flames and glowing extinguish within 30 s after removal				P
	No ignition of tissue paper or scorching of the pinewood board				P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE B (3 samples) In=80A I_{Δn} =30mA 1P+N , B type	B-1	B-2	B-3	P
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8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION				--
8.3	DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY				--
	RCCBs have adequate dielectric properties				
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]:	4kV			--
	see level of test laboratory [m]	Sea level			--
	test voltage (acc. Table 22) [kV]:	6,2 kV			--
9.7.7.4.2	RCCB in open position (contacts in open position)				P
	The impulses are applied between:				P
	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				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				P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 $1,25 I_{\Delta N}$	B1 – trip B2 – trip B3 – trip	--
	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		P
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	48 h in humidity cabinet RH = 91,8% to 93,2% T = 25,1 °C to 25,5°C	--
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:		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	a) between the terminals which are electrically connected together when the RCCB is in the closed position $\geq 2 \text{ M}\Omega$	B1 - >550 M Ω B2 - >550 M Ω B3 - >550 M Ω	P
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected) $\geq 2 \text{ M}\Omega$	B1 - >550 M Ω B2 - >550 M Ω B3 - >550 M Ω	P
	c) between all poles connected together and the frame $\geq 5 \text{ M}\Omega$	B1 - >550 M Ω B2 - >550 M Ω B3 - >550 M Ω	P
	d) between metal parts of the mechanism and the frame $\geq 5 \text{ M}\Omega$		N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material $\geq 5 \text{ M}\Omega$		N/A
9.7.3	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:		--
	a) electronic components disconnected2000 V	B1 - 2000 V B2 - 2000 V B3 - 2000 V	P
	b) electronic components disconnected2000 V	B1 - 2000 V B2 - 2000 V B3 - 2000 V	P
	c) electronic components disconnected.....2000 V	B1 - 2000 V B2 - 2000 V B3 - 2000 V	P
	d) electronic components disconnected2000 V		N/A
	e) electronic components disconnected2500 V		N/A
	No flashover or breakdown		
9.7.4	Insulation resistance of auxiliary circuits measured with 500 V DC after 1 min:		--
	1) between all auxiliary circuits and the frame $\geq 2 \text{ M}\Omega$		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 $\geq 2 \text{ M}\Omega$		N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:		--

IEC 62423															
Clause	Requirement + Test	Result - Remark	Verdict												
	<p>Rated voltage of auxiliary circuits (a.c. or d.c.)</p> <table border="1"> <thead> <tr> <th></th> <th>Test voltage (V)</th> </tr> </thead> <tbody> <tr> <td>≤ 30</td> <td>600</td> </tr> <tr> <td>$> 30 \leq 50$</td> <td>1000</td> </tr> <tr> <td>$> 50 \leq 110$</td> <td>1500</td> </tr> <tr> <td>$> 110 \leq 250$</td> <td>2000</td> </tr> <tr> <td>$> 250 \leq 500$</td> <td>2500</td> </tr> </tbody> </table>		Test voltage (V)	≤ 30	600	$> 30 \leq 50$	1000	$> 50 \leq 110$	1500	$> 110 \leq 250$	2000	$> 250 \leq 500$	2500	V	--
	Test voltage (V)														
≤ 30	600														
$> 30 \leq 50$	1000														
$> 50 \leq 110$	1500														
$> 110 \leq 250$	2000														
$> 250 \leq 500$	2500														
	1) between all auxiliary circuits and the frame		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		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.		--												
	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 $1,2\mu\text{s}$, and a time to half-value of $50\mu\text{s}$		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 $\leq 500\Omega$ and surge protective devices disconnected before testing or		N/A												
	- hybrid generator with an surge impedance of 2Ω 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]:		--												

IEC 62423					
Clause	Requirement + Test			Result - Remark	Verdict
	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)				N/A
	c) between all poles connected together and the frame				N/A
	d) between metal parts of the mechanism and the frame				N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material				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				
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 _{ΔN} A	Standard values of break time and non-actuating time at a residual current equal to	--

IEC 62423											
Clause	Requirement + Test			Result - Remark							Verdict
				$I_{\Delta N}$	$2 I_{\Delta N}$	$5 I_{\Delta N}$	$5 I_{\Delta N}$ 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 – 118ms B2 – 114ms B3 – 112ms							P
	- $2 I_{\Delta N}$			B1 - 83ms B2 – 85ms B3 - 83ms							P
	- $5 I_{\Delta N}$ or			B1 – 37ms B2 – 37ms B3 - 35ms							P
	- 0,25 A										N/A
	- 500 A			B1 – 12ms B2 – 12ms B3 - 12ms							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							N/A
	- $2 I_{\Delta N}$			0,06 s							N/A
	- $5 I_{\Delta N}$			0,05 s							N/A
	- $I_{\Delta t}$			0,04 s							N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (mm ²)	25mm ²	--
9.8.1	Ambient air temperature (°C)	22,0°C	--
9.8.2	Test current I _N (A) until steady state values are reached.	80A	--
	Four pole RCCBs:		N/A
	Current passing through		N/A
	- 3 phase poles (1)		N/A
	- neutral and adjacent pole (2)		N/A
	Parts Temperature rise K		--
	Terminals for external connections 65K	B1 – 53,1K B2 – 52,9K B3 – 57,4K	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 – 13,4K B2 – 14,1K B3 – 13,2K	P
	External metallic parts of operating means..... 25K		N/A
	Other external parts, including that face of the RCCB in direct contact with the mounting surface 60K	B1 – 45,2K B2 – 44,7K B3 – 43,6K	P
8.16	Reliability		--
	RCCBs operate reliably even after long service.		P
9.22.2	Test with 28 cycles at 40 ± 2°C		--
	Cross-section (mm ²)	25mm ²	--
	Torque ² / ₃ (Nm)	1,70Nm	--
	Test current I _N (A)	80A	--
	- with current passing 21 h	21h	P
	- without current..... 3 h	3h	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 – 57,9K B2 – 56,3K B3 – 55,6K	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 – <300ms B2 – <300ms B3 - <300ms	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 $40 \pm 2^\circ\text{C}$	168h at 40°C	--
	Test current I_N (A)	80A	--
	Cross-section (mm^2)	25 mm^2	--
	Electronic parts at $1,1 U_N$	264V	--
	After cool down:		P
	- 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		--
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1	B1 – <300ms B2 – <300ms B3 - <300ms	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)	B1 – 37ms B2 – 45ms B3 - 36ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE B (3 samples) In=80A IΔn =30mA 3P+N B type	B-4	B-5	B-6	P
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8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION				--
8.3	DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY				--
	RCCBs have adequate dielectric properties				
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]:	4kV			--
	see level of test laboratory [m]	Sea level			--
	test voltage (acc. Table 22) [kV]:	6,2 kV			--
9.7.7.4.2	RCCB in open position (contacts in open position)				P
	The impulses are applied between:				P
	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				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				P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 $1,25 I_{\Delta N}$	37,5mA	--
	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		P
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	48 h in humidity cabinet RH = 91,8% to 93,2% T = 25,1 to 25,5 °C	--
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:		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	a) between the terminals which are electrically connected together when the RCCB is in the closed position $\geq 2 \text{ M}\Omega$	B4 - >550 M Ω B5 - >550 M Ω B6->550 M Ω	P
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected) $\geq 2 \text{ M}\Omega$	B4 - >550 M Ω B5 - >550 M Ω B6- >550 M Ω	P
	c) between all poles connected together and the frame $\geq 5 \text{ M}\Omega$	B4 - >550 M Ω B5 - >550 M Ω B6->550 M Ω	P
	d) between metal parts of the mechanism and the frame $\geq 5 \text{ M}\Omega$		N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material $\geq 5 \text{ M}\Omega$		N/A
9.7.3	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:		--
	a) electronic components disconnected2000 V	B4- 2000 V B5 - 2000 V B6 - 2000 V	P
	b) electronic components disconnected2000 V	B4- 2000 V B5 - 2000 V B6 - 2000 V	P
	c) electronic components disconnected.....2000 V	B4- 2000 V B5 - 2000 V B6 - 2000 V	P
	d) electronic components disconnected2000 V		N/A
	e) electronic components disconnected2500 V		N/A
	No flashover or breakdown		
9.7.4	Insulation resistance of auxiliary circuits measured with 500 V DC after 1 min:		--
	1) between all auxiliary circuits and the frame $\geq 2 \text{ M}\Omega$		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 $\geq 2 \text{ M}\Omega$		N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:		--

IEC 62423															
Clause	Requirement + Test	Result - Remark	Verdict												
	<p>Rated voltage of auxiliary circuits (a.c. or d.c.)</p> <table border="1"> <thead> <tr> <th></th> <th>Test voltage (V)</th> </tr> </thead> <tbody> <tr> <td>≤ 30</td> <td>600</td> </tr> <tr> <td>$> 30 \leq 50$</td> <td>1000</td> </tr> <tr> <td>$> 50 \leq 110$</td> <td>1500</td> </tr> <tr> <td>$> 110 \leq 250$</td> <td>2000</td> </tr> <tr> <td>$> 250 \leq 500$</td> <td>2500</td> </tr> </tbody> </table>		Test voltage (V)	≤ 30	600	$> 30 \leq 50$	1000	$> 50 \leq 110$	1500	$> 110 \leq 250$	2000	$> 250 \leq 500$	2500	V	--
	Test voltage (V)														
≤ 30	600														
$> 30 \leq 50$	1000														
$> 50 \leq 110$	1500														
$> 110 \leq 250$	2000														
$> 250 \leq 500$	2500														
	1) between all auxiliary circuits and the frame		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		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.		--												
	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 $1,2\mu\text{s}$, and a time to half-value of $50\mu\text{s}$		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 $\leq 500\Omega$ and surge protective devices disconnected before testing or		N/A												
	- hybrid generator with an surge impedance of 2Ω 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]:		--												

IEC 62423					
Clause	Requirement + Test			Result - Remark	Verdict
	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)				N/A
	c) between all poles connected together and the frame				N/A
	d) between metal parts of the mechanism and the frame				N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material				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				
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.			B4 – 600V B5 – 600V B6 – 600V	P
	Type	I _N A	I _{ΔN} A	Standard values of break time and non-actuating time at a residual current equal to	--

IEC 62423											
Clause	Requirement + Test			Result - Remark							Verdict
				$I_{\Delta N}$	$2 I_{\Delta N}$	$5 I_{\Delta N}$	$5 I_{\Delta N}$ 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):										
	Maximum break times (ms) at:										--
	- $I_{\Delta N}$			B4 – 87ms B5 – 88ms B6 - 86ms							P
	- $2 I_{\Delta N}$			B4 – 36ms B5 – 34ms B6 - 33ms							P
	- $5 I_{\Delta N}$			B4 – 23ms B5 – 24ms B6 – 24ms							P
	- 0,25 A										N/A
	- 500A			B4 – 12ms B5 – 12ms B6 - 12ms							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							N/A
	- $2 I_{\Delta N}$			0,06 s							N/A
	- $5 I_{\Delta N}$			0,05 s							N/A
	- $I_{\Delta t}$			0,04 s							N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (mm ²)	25mm ²	--
9.8.1	Ambient air temperature (°C)	22,0°C	--
9.8.2	Test current I _N (A) until steady state values are reached.	80A	--
	Four pole RCCBs:		P
	Current passing through		P
	- 3 phase poles (1)		P
	- neutral and adjacent pole (2)		P
	Parts Temperature rise K		--
	Terminals for external connections 65K	B4 – 55,9K B5 – 56,2K B6 – 54,7K	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	B4 – 14,9K B5 – 15,1K B6 – 14,3K	P
	External metallic parts of operating means..... 25K		N/A
	Other external parts, including that face of the RCCB in direct contact with the mounting surface 60K	B4 – 46,8K B5 – 48,9K B6 – 47,6K	P
8.16	Reliability		--
	RCCBs operate reliably even after long service.		P
9.22.2	Test with 28 cycles at 40 ± 2°C		--
	Cross-section (mm ²)	25mm ²	--
	Torque ² / ₃ (Nm)	1,70Nm	--
	Test current I _N (A)	80A	--
	- with current passing 21 h	21h	P
	- without current..... 3 h	3h	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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	B4 – 55,6K B5 – 56,6K B6 – 54,2K	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	B4 – <300ms B5 – <300ms B6 – <300ms	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 $40 \pm 2^\circ\text{C}$	168h at 40°C	--
	Test current I_N (A)	80A	--
	Cross-section (mm^2)	25 mm^2	--
	Electronic parts at $1,1 U_N$	440V	--
	After cool down:		P
	- 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	B4 – <300ms B5 – <300ms B6 – <300ms	P
	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)	B4 – 43ms B5 - 47ms B6 -41ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE C (3 samples) In=80A IΔn =30mA 1P+N B type	C-1	C-2	C-3	P
--	---	-----	-----	-----	---

8.6	Mechanical and electrical endurance			P
	RCCBs shall be capable of performing an adequate number of mechanical and electrical operations			P
9.10	Test is made:			P
	- In ≤ 25 A; 2 s on; 13 s off			N/A
	- In > 25 A; 2 s on; 28 s off			P
	Number of operating cycles: 2000			P
	Test voltage Un (V); test current In (A); cos phi 0,85-0,9	242V/80,7A/0,88		--
	Cross-sectional area (mm ²)	25 mm ²		--
	RCCBs having IΔn > 0,010 A tested at:			--
	- 1000 cycles for manual operation	C1 - 1000 cycles C2 - 1000 cycles C3 -1000 cycles		P
	- 500 cycles by using the test device	C1 - 500 cycles C2 - 500 cycles C3 -500 cycles		P
	- 500 cycles at a current of IΔn	C1 - 500 cycles C2 - 500 cycles C3 -500 cycles		P
	RCCBs having IΔn ≤ 0,010 A tested at:			N/A
	- 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 IΔn	C1 - C2 - C3 -		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Test is made without load using manual operation:		--
	- $I_n \leq 25$ A; 2000 cycles	C1 - C2 - C3 -	N/A
	- $I_n > 25$ A; 1000 cycles	C1 - 1000 cycles C2 - 1000 cycles C3 - 1000 cycles	P
	After the test:		--
	- no undue wear		P
	- no damage		P
	- no loosening of connections		P
	- no seepage of sealing compound		
	The RCCB shall trip with a test current of $1,25 I_{\Delta n}$ (<300ms)	C1 – OK C2 – OK C3 - OK	P
	Dielectric strength test at a voltage of 900 V a.c. for 1 min:		--
	a)	C1 - 900V C2 - 900V C3 - 900V	P
	b)	C1 - 900V C2 - 900V C3 - 900V	P
	c)	C1 - 900V C2 - 900V C3 - 900V	P
	d)		N/A
	e)		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 – 41ms C2 – 43ms C3 - 39ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE C (3 samples) In=80A I Δ n =30mA 3P+N B type	C-4	C-5	C-6	P
--	--	-----	-----	-----	---

8.6	Mechanical and electrical endurance			P
	RCCBs shall be capable of performing an adequate number of mechanical and electrical operations			P
9.10	Test is made:			P
	- In \leq 25 A; 2 s on; 13 s off			N/A
	- In > 25 A; 2 s on; 28 s off			P
	Number of operating cycles: 2000			P
	Test voltage Un (V); test current In (A); cos phi 0,85-0,9	418V/80,7A/0,88		--
	Cross-sectional area (mm ²)	25 mm ²		--
	RCCBs having I Δ n > 0,010 A tested at:			--
	- 1000 cycles for manual operation	C4 - 1000 cycles C5 - 1000 cycles C6 -1000 cycles		P
	- 500 cycles by using the test device	C4 - 500 cycles C5 - 500 cycles C6 -500 cycles		P
	- 500 cycles at a current of I Δ n	C4 - 500 cycles C5 - 500 cycles C6 -500 cycles		P
	RCCBs having I Δ n \leq 0,010 A tested at:			N/A
	- 500 cycles for manual operation			N/A
	- 750 cycles by using the test device			N/A
	- 750 cycles at a current of I Δ n			N/A
	Test is made without load using manual operation:			--
	- In \leq 25 A; 2000 cycles			N/A
	- In > 25 A; 1000 cycles	C4 - 1000 cycles C5 - 1000 cycles C6- 1000 cycles		P
	After the test:			--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- no undue wear		P
	- no damage		P
	- no loosening of connections		P
	- no seepage of sealing compound		
	The RCCB shall trip with a test current of $1,25 I_{\Delta n}$ ($<300\text{ms}$)	C4 – OK C5 – OK C6 – OK	P
	Dielectric strength test at a voltage of 900 V a.c. for 1 min:		--
	a)	C4 - 900V C5 - 900V C6 - 900V	P
	b)	C4 - 900V C5 - 900V C6 - 900V	P
	c)	C4 - 900V C5 - 900V C6 - 900V	P
	d)		N/A
	e)		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 – 52ms C5 – 41ms C6 – 47ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE D (3 samples) In=80A I Δ n =30mA 1P+N B type	D1	D2	D3	P
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Tests "D0"											
8.5	Operating characteristics										--
	For multiple settings of I Δ 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)										N/A
	Type	I _N A	I Δ n A	Standard values of break time and non-actuating time at a residual current equal to							--
				I Δ n	2 I Δ n	5 I Δ n	5 I Δ 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 Δ n to I Δ n within 30 s (mA)						D1 – 6mA to 30mA D2 – 6mA to 30mA D3 -- 6mA to 30mA				P
	- tripping current between I Δ no and I Δ n (mA)						D1 – 24,3mA D2 – 24,5mA D3 – 24,6mA				P
9.9.2.2	Verification of the correct operation at closing on residual current										--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 ($\leq 300\text{ms}$)	D1 – 123ms D2 – 121ms D3 - 116ms	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 S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		--
	- maximum break time (300ms) at: $I_{\Delta n}$	D1 – 117ms D2 – 116ms D3 - 117ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D1 – 57ms D2 – 57ms D3 - 56ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D1 – 27ms D2 – 22ms D3 - 21ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D1 – 12ms D2 – 13ms D3 – 12ms	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 S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		--
	- maximum break time (40ms) at: 5A (value 1 between 5A and 200A)	D1 – 13ms D2 – 14ms D3 - 12ms	P
	- maximum break time (40ms) at: 20A (value 2 between 5A and 200A)	D1 – 14ms D2 – 15ms D3 - 14ms	P
	No value exceeds the relevant specified limiting value		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s:		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		P
	- maximum break time (300ms) at: $I_{\Delta n}$:	D1 – 117ms D2 – 117ms D3 - 115ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$:	D1 – 56ms D2 – 59ms D3 - 56ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$:		N/A
	- maximum break time (ms) at: 0,25 A (if applicable):	D1 – 22ms D2 – 21ms D3 – 22ms	P
	- maximum break time (40ms) at: 500 A:	D1 – 12ms D2 – 13ms D3 - 13ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during the tests		N/A
9.9.2.5	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): I_n , the pole under test and one other pole loaded with rated current, the current being established shortly before the test	80,0A	--
	- cross-sectional area (mm ²)	25 mm ²	--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (300ms)	D1 – 121ms D2 – 117ms D3 - 118ms	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		--
	- maximum break time (300ms) at: $I_{\Delta n}$	D1 – 116ms D2 – 117ms D3 – 115ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D1 – 55ms D2 – 55ms D3 – 55ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (40ms) at: 0,25 A (if applicable)	D1 – 25ms D2 – 24ms D3 – 24ms	P
	- maximum break time (40ms) at: 500 A	D1 – 13ms D2 – 12ms D3 – 12ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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): I_n at a temperature of +40 °C: until steady state conditions are reached	+40 ° C	--
	- cross-sectional area (mm ²)	35 mm ²	--
	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		P
	- maximum break time (300ms) at: $I_{\Delta n}$	D1 – 117ms D2 – 117ms D3 – 115ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D1 – 59ms D2 – 59ms D3 - 56ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)	D1 – 23ms D2 – 21ms D3 - 22ms	P
	- maximum break time (40ms) at: 500 A	D1 – 12ms D2 – 12ms D3 - 12ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$ for 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during the tests		N/A

IEC 62423					
Clause	Requirement + Test			Result - Remark	Verdict
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:			0,2 I _{ΔN}	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 _{ΔN}	0,138 I _{ΔN}	0,035 I _{ΔN}	0,2 I _{ΔN}	
	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 _{ΔN}) within 30 s				P
	- tripping current between 0,5 I _{ΔN} and 1,4 I _{ΔN} (mA):			D1 – 29,8mA D2 – 29,8mA D3 – 29,9mA	P
9.1.3 addition acc. IEC 62423	Verification of the correct operation in case of sudden appearance of composite residual current				P
	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 _{ΔN} (<40ms) :			D1 – 23ms D2 – 24ms D3 -- 24ms	P
	max. break time:				P
	- general type RCCBs: 40ms				P
	- S type RCCBs: 150ms				N/A
	Additional test for type S:				--
	- minimum non actuating time (ms) at: 7 I _{ΔN} ; 0,05 s :				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 _{ΔN} not tested in D ₁ , test acc. figure 6b				N/A
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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- steady increase from max. 0,2 I _{Δn} to 2 I _{Δn} within 30 s (mA)		N/A
	- tripping current between 0,5 I _{Δn} and 2 I _{Δn} (mA) ...:		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 S1 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 (300ms) at: 2 I _{Δn}		N/A
	- maximum break time (150ms) at: 4 I _{Δn}		N/A
	- maximum break time (40ms) at: 10 I _{Δn}		N/A
	No value exceeds the relevant specified limiting value		N/A
8.15	Behaviour of RCCBs in case of earth fault currents comprising a d.c. component		P
9.9.3	Additional verification of correct operation at residual currents with d.c. components for RCCBs type A		P
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)		N/A
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 _{Δn} for I _{Δn} > 0,01 A with 1,4 I _{Δn} /30 A/s (mA)		P
	- steady increase from zero to: 2 I _{Δn} for I _{Δn} ≤ 0,01 A with 2 I _{Δn} /30 A/s (mA)		N/A
	- angle α = 0° (+/-)	D1 - +33,4mA/-32,9mA D2 - +33,5mA/-32,8mA D3 - +33,4mA/-32,9mA	P
	- angle α = 90° (+/-)	D1 - +27,9mA/-28,6mA D2 - +28,0mA/-28,7mA D3 - +27,9mA/-28,7mA	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- angle $\alpha = 135^\circ$ (+/-)	D1 - +30,0mA/-30,4mA D2 - +30,0mA/-30,2mA D3 - +30,1mA/-30,5mA	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 $\alpha = 0^\circ$)		
	RCCBs with $I_{\Delta n} < 0,03$ A:		
	- maximum break time (ms) at: $2 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: $4 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: 0,5 A rms (+/-)		N/A
	- maximum break time (ms) at: 350 A rms (+/-)		N/A
	RCCBs with $I_{\Delta n} = 0,03$ A:		
	- maximum break time (300ms) at: $1,4 I_{\Delta n}$ (+/-)	D1 - +112ms/-113ms D2 - +114ms/-112ms D3 - +113ms/-115ms	P
	- maximum break time (150ms) at: $2,8 I_{\Delta n}$ (+/-)	D1 - +42ms/-39ms D2 - +43ms/41ms D3 - +44ms/-40ms	P
	- maximum break time (40ms) at: 0,35 A rms (+/-)	D1 - +14ms/-15ms D2 - +13ms/-15ms D3 - +14ms/-14ms	P
	- maximum break time (40ms) at: 350 A rms (+/-) :	D1 - +10ms/-11ms D2 - +12ms/-10ms D3 - +11ms/-12ms	P
	RCCBs with $I_{\Delta n} > 0,03$ A:		
	- maximum break time (ms) at: $1,4 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: $2,8 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: $7 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: 350 A rms (+/-)		N/A
	No value exceeds the relevant specified limiting value		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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): I_n	80,0A	—
	- 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)		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 $\alpha = 0^\circ$ (+/-)	D1 - +33,3mA/-32,7mA D2 - +33,5mA/-32,8mA D3 - +33,4mA/-32,9mA	P
	- angle $\alpha = 90^\circ$ (+/-)	D1 - +27,9mA/-28,5mA D2 - +28,0mA/-28,7mA D3 - +28,1mA/-28,6mA	P
	- angle $\alpha = 135^\circ$ (+/-)	D1 - +29,9mA/-30,5mA D2 - +30,0mA/-30,5mA D3 - +30,0mA/-30,6mA	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 $\alpha = 0^\circ$ 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)		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 $\alpha = 0^\circ$ (+/-) (+/- 6 mA)	D1 - +35,1mA/-31,2mA D2 - +35,2mA/-31,3mA D3 - +35,3mA/-31,4mA	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

IEC 62423								
Clause	Requirement + Test			Result - Remark				Verdict
	Verification of the correct operation in case of residual pulsating d.c. currents with angle $\alpha = 0^\circ$ 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 $\alpha = 0^\circ$ (+/-) (+/- 10 mA)							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 $(20 \pm 5)^\circ\text{C}$							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) :			264V/195V				P
	Tests a rated frequency							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							P
	Test at 150Hz:							P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- steady increase from max. $0,2 I_{\Delta n}$ to $2,4 I_{\Delta n}$ within 30 s (mA)	D1 – 6mA to 72mA D2 – 6mA to 72mA D3 - 6mA to 72mA	P
	- tripping current between $0,5 I_{\Delta n}$ and $2,4 I_{\Delta n}$ (mA) :	D1 – 22,6mA D2 – 22,5mA D3 – 22,6mA	P
	Test at 400Hz:		P
	- steady increase from max. $0,2 I_{\Delta n}$ to $6 I_{\Delta n}$ within 30 s (mA)	D1 - 6mA to 180mA D2 - 6mA to 180mA D3 - 6mA to 180mA	P
	- tripping current between $0,5 I_{\Delta n}$ and $6 I_{\Delta n}$ (mA) ..:	D1 – 25,1mA D2 – 25,2mA D3 – 25,1mA	P
	Test at 1000Hz:		P
	- steady increase from max. $0,2 I_{\Delta n}$ to $14 I_{\Delta n}$ within 30 s (mA)	D1 - 6mA to 420mA D2 - 6mA to 420mA D3 -6mA to 420mA	P
	- tripping current between $I_{\Delta n}$ and $14 I_{\Delta n}$ (mA)	D1 – 47,8mA D2 – 47,8mA D3 – 47,9mA	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 – 12ms D2 – 12ms D3 – 11ms	P
	max. break time:		P
	- general type RCCBs: 0,3s		P
	- 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 :		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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	- 0,4 I _{Δn} or		P
	- 10 mA		N/A
	whichever is the higher value		P
	Residual alternating current at rated frequency applied to another pole and:		P
	- steady increase from max. 0,2 I _{Δn} to I _{Δn} within 30 s (mA)	D1 – 6mA to 30mA D2 - 6mA to 30mA D3 - 6mA to 30mA	P
	- alternating tripping current ≤ I _{Δn} (mA)	D1 – 20,0mA/20,3mA D2 - 20,1mA/20,3mA D3 – 20,0mA/20,2mA	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		P
	- 0,4 I _{Δn} or		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 _{Δn} to 1,4 I _{Δn} within 30 s (mA) for RCCBs with I _{Δn} >0,01 A.....	D1 – 6 mA to 42 mA D2 - 6 mA to 42 mA D3 -6 mA to 42 mA	P
	- steady increase from max. 0,2 I _{Δn} to 2 I _{Δn} within 30 s (mA) for RCCBs with I _{Δn} ≤0,01 A.....	D1 - D2 - D3 -	N/A
	RCCB tested twice at each position I and II of S ₃ and S ₄		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- residual pulsating tripping current $\leq 1,4 I_{\Delta n}$ (mA) for RCCBs with $I_{\Delta n} > 0,01$ A.....:	D1 – 28,2mA D2 – 28,2mA D3 – 28,2mA	P
	- residual pulsating tripping current $\leq 2 I_{\Delta n}$ (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:		P
	- steady increase from max. $0,2 I_{\Delta n}$ to $2 I_{\Delta n}$ within 30 s (mA).....:	D1 – 6mA to 60mA D2 - 6mA to 60mA D3 - 6mA to 60mA	P
	-tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$:	D1 – 23,2mA/25,5mA D2 – 23,2mA/25,4mA D3 – 23,3mA/25,5mA	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 (300ms) at: $2 I_{\Delta n}$ A (value given in table 1)	D1 – 60ms/62ms D2 – 62ms/62ms D3 - 62ms/61ms	P
	- maximum break time (150ms) at: $4 I_{\Delta n}$ A (value given in table 1)	D1 – 34ms/36ms D2 – 34ms/36ms D3 - 34ms/34ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$ A (value given in table 1)	D1 – 23ms/23ms D2 – 26ms/26ms D3 - 20ms/23ms	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	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 _{Δn} to 2 I _{Δn} within 30 s (mA).....:	D1 - D2 - D3 -	N/A
	-tripping current between 0,5 I _{Δn} and 2 I _{Δn}:	D1 - D2 - D3 -	N/A
b)	The test circuit being successively calibrated at 2 I _{Δn} 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 _{Δn}	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	Verification of the correct operation in case of residual smooth direct current without load ,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 _{Δn} to 2 I _{Δn} within 30 s (mA)	D1 – 6mA to 60mA D2 - 6mA to 60mA D3 - 6mA to 60mA	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$ (mA) ...:	D1 – 20,8mA/23,3mA D2 – 20,9mA/23,2mA D3 – 20,9mA/23,2mA	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 S1 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 (300ms) at: $2 I_{\Delta n}$	D1 – 75ms/81ms D2 – 82ms/81ms D3 - 81ms/84ms	P
	- maximum break time (150ms) at: $4 I_{\Delta n}$	D1 – 36ms/37ms D2 – 36ms/35ms D3 - 34ms/36ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D1 – 26ms/22ms D2 – 25ms/23ms D3 - 23ms/23ms	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		P
	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	- test current (A): I_n , until steady state conditions are reached	80,0A	P
	- cross-sectional area (mm ²)	25 mm ²	P
	- steady increase from max. $0,2 I_{\Delta n}$ to $2 I_{\Delta n}$ within 30 s (mA)	D1 – 6mA to 60mA D2 - 6mA to 60mA D3 -6mA to 60mA	P
	- tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$ (mA) ...:	D1 – 20,9mA/23,2mA D2 – 20,9mA/23,3mA D3 -20,9mA/23,4mA	P
9.2.2 addition acc. IEC 62423	Only applicable for RCCBs of type B: Tests at the temperature limits		P
	tests acc. 9.2.1.5 b), 9.2.1.6 b) and 9.2.1.7.1 b) under the following conditions:		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- ambient temperature: -5°C, off load		P
	- ambient temperature: +40°C RCCB previously loaded with rated current until steady state conditions are reached		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 (300ms) at: 2 I _{Δn}	D1 – 62ms/62ms D2 – 61ms/58ms D3 - 57ms/61ms	P
	- maximum break time (150ms) at: 4 I _{Δn}	D1 – 35ms/30ms D2 – 37ms/33ms D3 – 35ms/35ms	P
	- maximum break time (40ms) at: 10 I _{Δn}	D1 – 20ms/20ms D2 – 20ms/21ms D3 -21ms/21ms	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 _{Δn} 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		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (300ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (150ms) at: $4 I_{\Delta n}$		N/A
	- maximum break time (40ms) at: $10 I_{\Delta n}$		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 S1 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 (300ms) at: $2 I_{\Delta n}$	D1 – 71ms/69ms D2 – 72ms/70ms D3 – 67ms/67ms	P
	- maximum break time (140ms) at: $4 I_{\Delta n}$	D1 – 37ms/37ms D2 – 35ms/35ms D3 – 36ms/32ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D1 – 23ms/24ms D2 – 23ms/23ms D3 – 23ms/22ms	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): I_n , until steady state conditions are reached	80,0A	P
	- cross-sectional area (mm ²)	25 mm ²	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 S1 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 (300ms) at: 2 I _{Δn}	D1 – 63ms/61ms D2 – 63ms/58ms D3 – 58ms/60ms	P
	- maximum break time (140ms) at: 4 I _{Δn}	D1 – 32ms/34ms D2 – 33ms/34ms D3 – 33ms/34ms	P
	- maximum break time (40ms) at: 10 I _{Δn}	D1 – 19ms/21ms D2 – 20ms/21ms D3 – 21ms/20ms	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:		N/A
	- test current (A): I _n , until steady state conditions are reached		N/A
	- cross-sectional area (mm ²)		N/A
	Test acc. figure 6b		N/A
b)	The test circuit being successively calibrated at 2 I _{Δn} and any other two chosen values given in Table 1 taken at random, the test switch S1 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 _{Δn}		N/A
	- maximum break time (ms) at: _____A (value given in table 1)		N/A
	- maximum break time (ms) at: _____A (value given in table 1)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 S1 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): I _n , until steady state conditions are reached	80,0A	P
	- cross-sectional area (mm ²)	25 mm ²	P
	- maximum break time (300ms) at: 2 I _{Δn}	D1 – 69ms/64ms D2 – 71ms/68ms D3 – 68ms/65ms	P
	- maximum break time (140ms) at: 4 I _{Δn}	D1 – 32ms/31ms D2 – 35ms/32ms D3 – 33ms/33ms	P
	- maximum break time (40ms) at: 10 I _{Δn}	D1 – 22ms/23ms D2 – 23ms/21ms D3 – 22ms/23ms	P
	No value exceeds the relevant specified limiting value		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
9.17.1	Limiting value of the line voltage (U _x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		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 (U _n)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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 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: $I_{\Delta n}$		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		P
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		P
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19.1	Current surge test for all RCCBs (0,5 μ s/100kHz ring wave test)		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	- peak value: 200 A + 10/0%	D1-204A D2-204A D3-204A	P
	- virtual front time: 0,5 μ s \pm 30%		P
	- period of the following oscillatory wave: 10 μ s \pm 20%		P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	The interval between two consecutive applications shall be about 30 s		P
	During the test the RCCB shall not trip	Not trip	P
	- break time ($\leq 300\text{ms}$) at $I_{\Delta n}$	D1 – 122ms D2 – 116ms D3 - 117ms	P
9.19.2 9.1.5 addition acc. IEC 62423	Verification of behaviour at surge currents up to 3000A (8/20 μs surge current)		--
9.19.2.1	Test conditions		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	Peak value: 3000A +10/-0%	D1 – 3050A D2 – 3040A D3 - 3040A	P
	Virtual front time: 0,8 μs \pm 20%		P
	Virtual time of half value: 20 μs \pm 20%		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		P
	- break time (ms) at $I_{\Delta n}$	D1 – 114ms D2 – 115ms D3 - 113ms	P
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed		N/A
	- break time (ms) at $I_{\Delta n}$		N/A
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

IEC 62423					
Clause	Requirement + Test			Result - Remark	Verdict
	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				N/A
	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} 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):				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				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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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 _{Δn} to 2,4 I _{Δn} within 30 s (mA)		N/A
	- tripping current between 0,5 I _{Δn} and 2,4 I _{Δn} (mA) :		N/A
	Test at 400Hz:		N/A
	- steady increase from max. 0,2 I _{Δn} to 6 I _{Δn} within 30 s (mA)		N/A
	- tripping current between 0,5 I _{Δn} and 6 I _{Δn} (mA) ..:		N/A
	Test at 1000Hz:		N/A
	- steady increase from max. 0,2 I _{Δn} to 14 I _{Δn} within 30 s (mA)		N/A
	- tripping current between I _{Δn} and 14 I _{Δn} (mA)		N/A
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 _{Δn} (ms) :		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 _{Δn} ; 0,13 s :		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 _{Δn} , test acc. figure 6b		N/A
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 _{Δn} to 2 I _{Δn} within 30 s (mA)		N/A
	- tripping current between 0,5 I _{Δn} and 2 I _{Δn} (mA) ..:		N/A

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 S1 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 _{Δn}		N/A
	- maximum break time (ms) at: 4 I _{Δn}		N/A
	- maximum break time (ms) at: 10 I _{Δn}		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 _{Δm}	800A	--
	Test circuit according to figure	Figure 7	--
	Point of test circuit which is directly earthed	Supply side	--
	Grid distance "a" (mm)	25mm	--
	Prospective current (A)	800A	--
	Prospective current obtained (A)	805A	--
	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-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 U _n and shall not exceed 2mA (mA)	D1 – 2,78uA D2 – 2,51uA D3 – 2,63uA	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 U _n for 1 min:		--
	a)	D1 – 480V D2 – 480V D3 - 480V	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	b)	D1 – 480V D2 – 480V D3 - 480V	P
	c)	D1 – 480V D2 – 480V D3 - 480V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown		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 _{Δn} (ms)	D1 – 109ms D2 – 102ms D3 -105ms	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 (U _x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 $I_{\Delta n}$	<1,66 $I_{\Delta n}$ =99,6 D-1-73,4 D-2-73,1 D-3-73,4	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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	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		P
	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 – no opening D2 - no opening D3 - no opening	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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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
9.12.2.3	RCCBs of plug-in type (under consideration)		N/A
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		--
	RCCBs shall not operate under specified conditions of overcurrent		N/A
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	480A/1s	P
	Test repeated three times with an interval of at least 1 min		P
	The RCCB shall not open	D1 - not open D2 - not open D3 - not open	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		N/A
	The RCCB shall not open		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 – 46ms D2 - 41ms D3 - 49ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	Tests "D2" 80A, 30mA, 1P+N , B type	D ₂ -1	D ₂ -2	D ₂ -3	P
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)	25mm			--
	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				--
	Prospective current - 500A or - 10 I _n (A)	800A			--
	Prospective current (A)	800A			--
	Prospective current obtained (A)	805A			--
	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 U _n and shall not exceed 2mA (mA)	D ₂ -1 – 2,29uA D ₂ -2 – 2,45uA D ₂ -3 – 2,34uA			P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 U _n for 1 min:				--
	a)	D ₂ -1 – 480V D ₂ -2 – 480V D ₂ -3 – 480V			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	b)	D ₂ -1 – 480V D ₂ -2 – 480V D ₂ -3 – 480V	P
	c)	D ₂ -1 – 480V D ₂ -2 – 480V D ₂ -3 – 480V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	D ₂ -1 – OK D ₂ -2 – OK D ₂ -3 - OK	P
	Making and breaking In at Un	D ₂ -1 – OK D ₂ -2 – OK D ₂ -3 - OK	P
	The RCCB shall trip with a test current of 1,25 I _{Δn} (ms)	D ₂ -1 – 96ms D ₂ -2 – 92ms D ₂ -3 - 89ms	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 (U _x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		M/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts		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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta n0}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s	-	N/A
	No tripping during tests		
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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 $2,5 I_{\Delta n}$ with smooth direct current maximum break time (ms)	D ₂₋₁ – 46ms D ₂₋₂ - 37ms D ₂₋₃ - 49ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE D (3 samples) I _n =80A, I _{Δn} =30mA, 3P+N	D-4	D-5	D-6	
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Tests "D0"											
8.5	Operating characteristics										--
	For multiple settings of I _{Δn} 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)										N/A
	Type	I _N A	I _{Δn} A	Standard values of break time and non-actuating time at a residual current equal to							--
				I _{Δn}	2 I _{Δn}	5 I _{Δn}	5 I _{Δn} OF 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 _{Δn} to I _{Δn} within 30 s (mA)						D4 – 6mA to 30mA D5 – 6mA to 30mA D6 -- 6mA to 30mA				P
	- tripping current between I _{Δno} and I _{Δn} (mA)						D4 – 23,6mA D5 – 23,7mA D6 – 23,7mA				P
9.9.2.2	Verification of the correct operation at closing on residual current										--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 ($\leq 300\text{ms}$)	D4 – 97ms D5 – 97ms D6 - 97ms	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 S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		--
	- maximum break time (300ms) at: $I_{\Delta n}$	D4 – 96ms D5 – 97ms D6 - 96ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D4 – 53ms D5 – 51ms D6 - 52ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D4 – 23ms D5 – 21ms D6 - 23ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D4 – 12ms D5 – 12ms D6 – 12ms	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 S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		--
	- maximum break time (40ms) at: 5A (value 1 between 5A and 200A)	D4 – 14ms D5 – 12ms D6 - 12ms	P
	- maximum break time (40ms) at: 20A (value 2 between 5A and 200A)	D4 – 11ms D5 – 12ms D6 - 13ms	P
	No value exceeds the relevant specified limiting value		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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		P
	- maximum break time (300ms) at: $I_{\Delta n}$	D4 – 93ms D5 – 94ms D6 - 94ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D4 – 54ms D5 – 69ms D6 - 53ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D4 – 24ms D5 – 23ms D6 - 22ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D4 – 14ms D5 – 12ms D6 - 12ms	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 :	-	N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s:		N/A
	No tripping during the tests		N/A
9.9.2.5	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): I_n , the pole under test and one other pole loaded with rated current, the current being established shortly before the test:	80,0A	--
	- cross-sectional area (mm ²):	25 mm ²	--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (300ms):	D4 – 95ms D5 – 94ms D6 - 93ms	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		--
	- maximum break time (300ms) at: $I_{\Delta n}$:	D4 – 94ms D5 – 92ms D6 - 94ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$:	D4 – 51ms D5 – 49ms D6 - 52ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$:	D4 – 21ms D5 – 19ms D6 - 18ms	P
	- maximum break time (ms) at: 0,25 A (if applicable):		N/A
	- maximum break time (40ms) at: 500 A:	D4 – 12ms D5 – 12ms D6 - 12ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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): I_n at a temperature of +40 °C: until steady state conditions are reached	+40 ° C	--
	- cross-sectional area (mm ²)	25 mm ²	--
	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		P
	- maximum break time (300ms) at: $I_{\Delta n}$	D4 – 94ms D5 – 94ms D6 - 93ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D4 – 53ms D5 – 54ms D6 - 54ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D4 – 24ms D5 – 23ms D6 - 23ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D4 – 13ms D5 – 14ms D6 - 13ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$ for 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A

IEC 62423					
Clause	Requirement + Test			Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s				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:			0,2 I _{ΔN}	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 _{ΔN}	0,138 I _{ΔN}	0,035 I _{ΔN}	0,2 I _{ΔN}	
	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 _{ΔN}) within 30 s				P
	- tripping current between 0,5 I _{ΔN} and 1,4 I _{ΔN} (mA):			D4 – 29,9mA D5 – 29,8mA D6 – 29,9mA	P
9.1.3 addition acc. IEC 62423	Verification of the correct operation in case of sudden appearance of composite residual current				P
	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 _{Δn} (ms) :			D4 – 25ms D5 – 26ms D6 - 25ms	P
	max. break time:				P
	- general type RCCBs: 40ms				P
	- S type RCCBs: 150ms				N/A
	Additional test for type S:				--
	- minimum non actuating time (ms) at: 7 I _{Δn} ; 0,05 s :			-	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 _{Δn} not tested in D ₁ , test acc. figure 6b				N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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 _{Δn} to 2 I _{Δn} within 30 s (mA)		N/A
	- tripping current between 0,5 I _{Δn} and 2 I _{Δn} (mA) .. :		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 (300ms) at: 2 I _{Δn}		N/A
	- maximum break time (150ms) at: 4 I _{Δn}		N/A
	- maximum break time (40ms) at: 10 I _{Δn}		N/A
	No value exceeds the relevant specified limiting value		N/A
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		P
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)		N/A
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 _{Δn} for I _{Δn} > 0,01 A with 1,4 I _{Δn} /30 A/s (mA)		P
	- steady increase from zero to: 2 I _{Δn} for I _{Δn} ≤ 0,01 A with 2 I _{Δn} /30 A/s (mA)		N/A
	- angle α = 0° (+/-)	D4 - +32,9mA/-32,3mA D5 - +32,7mA/-32,2mA D6 - +32,8mA/-32,3mA	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- angle $\alpha = 90^\circ$ (+/-)	D4 - +27,5mA/-28,1mA D5 - +27,8mA/-28,2mA D6 - +27,5mA/-28,3mA	P
	- angle $\alpha = 135^\circ$ (+/-)	D4 - +29,5mA/-29,6mA D5 - +29,5mA/-29,6mA D6 - + 29,4mA/-29,7mA	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 $\alpha = 0^\circ$)		
	RCCBs with $I_{\Delta n} < 0,03$ A:		
	- maximum break time (ms) at: $2 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: $4 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: 0,5 A rms (+/-)		N/A
	- maximum break time (ms) at: 350 A rms (+/-)		N/A
	RCCBs with $I_{\Delta n} = 0,03$ A:		
	- maximum break time (300ms) at: $1,4 I_{\Delta n}$ (+/-)	D4 - +82ms/-78ms D5 - +79ms/-76ms D6 -+77ms/-78ms	P
	- maximum break time (150ms) at: $2,8 I_{\Delta n}$ (+/-)	D4 - +42ms/-34ms D5 - +37ms/33ms D6 -+36ms/-33ms	P
	- maximum break time (40ms) at: 0,35 A rms (+/-)	D4 - +19ms/-15ms D5 - +15ms/-13ms D6 -+16ms/-15ms	P
	- maximum break time (40ms) at: 350 A rms (+/-) :	D4 - +10ms/-12ms D5 - +11ms/-10ms D6 - +12ms/-11ms	P
	RCCBs with $I_{\Delta n} > 0,03$ A:		
	- maximum break time (ms) at: $1,4 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: $2,8 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: $7 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: 350 A rms (+/-)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		N/A
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): I_n	80,0A	—
	- 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)		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 $\alpha = 0^\circ$ (+/-)	D4 - +32,8mA/-32,2mA D5 - +32,7mA/-32,3mA D6 - +32,9mA/-32,3mA	P
	- angle $\alpha = 90^\circ$ (+/-)	D4 - +27,6mA/-28,3mA D5 - +27,5mA/-28,2mA D6 - +27,7mA/-28,3mA	P
	- angle $\alpha = 135^\circ$ (+/-)	D4 - +29,6mA/-29,8mA D5 - +29,6mA/-29,8mA D6 - +29,7mA/-29,9mA	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 $\alpha = 0^\circ$ 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)		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 $\alpha = 0^\circ$ (+/-) (+/- 6 mA)	D4 - +33,2mA/-29,8mA D5 - +33,2mA/-29,6mA D6 - +33,3mA/-29,7mA	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		--

IEC 62423									
Clause	Requirement + Test				Result - Remark				Verdict
	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 $\alpha = 0^\circ$ 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 $\alpha = 0^\circ$ (+/-) (+/- 10 mA)								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 $(20 \pm 5)^\circ\text{C}$								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) :								P
	Tests a rated frequency								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								--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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 _{Δn} to 2,4 I _{Δn} within 30 s (mA)	D4 – 6mA to 72mA D5 – 6mA to 72mA D6 - 6mA to 72mA	P
	- tripping current between 0,5 I _{Δn} and 2,4 I _{Δn} (mA) :	D4 – 22,5mA D5 – 22,5mA D6 – 22,6mA	P
	Test at 400Hz:		P
	- steady increase from max. 0,2 I _{Δn} to 6 I _{Δn} within 30 s (mA)	D4 - 6mA to 180mA D5 - 6mA to 180mA D6 - 6mA to 180mA	P
	- tripping current between 0,5 I _{Δn} and 6 I _{Δn} (mA) ..:	D4 – 25,2mA D5 – 25,1mA D6 – 25,2mA	P
	Test at 1000Hz:		P
	- steady increase from max. 0,2 I _{Δn} to 14 I _{Δn} within 30 s (mA)	D4 - 6mA to 420mA D5 - 6mA to 420mA D6 -6mA to 420mA	P
	- tripping current between I _{Δn} and 14 I _{Δn} (mA)	D4 – 47,9mA D5 – 47,9mA D6 – 47,9mA	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 _{Δn} (ms) :	D4 – 13ms D5 – 12ms D6 – 12ms	P
	max. break time:		P
	- general type RCCBs: 0,3s		P
	- S type RCCBs: 0,5s		N/A
	Additional test for type S:		N/A
	- minimum non actuating time (ms) at: 14 I _{Δn} ; 0,13 s :		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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	A	P
	- 0,4 I _{Δn} or	12mA	P
	- 10 mA		N/A
	whichever is the higher value		P
	Residual alternating current at rated frequency applied to another pole and:		P
	- steady increase from max. 0,2 I _{Δn} to I _{Δn} within 30 s (mA)	D4 – 6mA to 30mA D5 - 6mA to 30mA D6 - 6mA to 30mA	P
	- alternating tripping current ≤ I _{Δn} (mA)	D4 – 20,1mA/20,2mA D5 - 20,0mA/20,2mA D6 – 20,1mA/20,2mA	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		P
	- 0,4 I _{Δn} 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 _{Δn} to 1,4 I _{Δn} within 30 s (mA) for RCCBs with I _{Δn} >0,01 A.....	D4 – 6 mA to 42 mA D5 - 6 mA to 42 mA D6 -6 mA to 42 mA	P
	- steady increase from max. 0,2 I _{Δn} to 2 I _{Δn} within 30 s (mA) for RCCBs with I _{Δn} ≤0,01 A.....		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	RCCB tested twice at each position I and II of S ₃ and S ₄		P
	- residual pulsating tripping current $\leq 1,4 I_{\Delta n}$ (mA) for RCCBs with $I_{\Delta n} > 0,01$ A.....:	D4 – 28,2mA D5 – 28,2mA D6 – 28,2mA	P
	- residual pulsating tripping current $\leq 2 I_{\Delta n}$ (mA) for RCCBs with $I_{\Delta n} \leq 0,01$ A.....:		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:		P
	- steady increase from max. $0,2 I_{\Delta n}$ to $2 I_{\Delta n}$ within 30 s (mA).....:	D4 – 6mA to 60mA D5 - 6mA to 60mA D6 - 6mA to 60mA	P
	-tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$:	D4 – 23,3mA/25,5mA D5 – 23,2mA/25,4mA D6 – 23,3mA/25,4mA	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 (300ms) at $2 I_{\Delta n}$: (value given in table 1)	D4 – 61ms/63ms D5 - 61ms/63ms D6 - 61ms/62ms	P
	- maximum break time (150ms) at: $4 I_{\Delta n}$ (value given in table 1)	D4 – 38ms/38ms D5 - 37ms/34ms D6 - 37ms/38ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$ (value given in table 1)	D4 – 25ms/25ms D5 - 25ms/23ms D6 - 21ms/22ms	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	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:		P
	- steady increase from max. 0,2 I _{Δn} to 2 I _{Δn} within 30 s (mA).....:	D4 – 6mA to 60mA D5 - 6mA to 60mA D6 - 6mA to 60mA	P
	-tripping current between 0,5 I _{Δn} and 2 I _{Δn}:	D4 – 20,6mA/23,4mA D5 – 20,6mA/23,3mA D6 – 20,5mA/23,4mA	P
b)	The test circuit being successively calibrated at 2 I _{Δn} 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 (300ms) at: 2 I _{Δn}	D4 – 67ms/71ms D5 - 66ms/65ms D6 - 66ms/65ms	P
	- maximum break time (150ms) at: 4 I _{Δn} (value given in table 1)	D4 – 34ms/36ms D5 - 34ms/36ms D6 - 34ms/37ms	P
	- maximum break time (40ms) at: 10 I _{Δn} (value given in table 1)	D4 – 27ms/32ms D5 - 27ms/32ms D6 - 27ms/27ms	P
	No value exceeds the relevant specified limiting value		P

9.2.1.7.1 addition acc. IEC 62423	Verification of the correct operation in case of residual smooth direct current without load ,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

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)	D4 – 6mA to 60mA D5 - 6mA to 60mA D6 - 6mA to 60mA	P
	- tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$ (mA) . :	D4 – 20,6mA/23,1mA D5 – 20,6mA/23,2mA D6 – 20,6mA/23,2mA	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 S1 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 (300ms) at: $2 I_{\Delta n}$	D4 – 81ms/82ms D5 – 81ms/79ms D6 - 81ms/81ms	P
	- maximum break time (150ms) at: $4 I_{\Delta n}$	D4 – 36ms/33ms D5 – 36ms/34ms D6 - 34ms/32ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D4 – 22ms/23ms D5 – 24ms/22ms D6 - 21ms/22ms	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		P
	Verification of the correct operation in case of a steady increase residual smooth direct current:		--
	- test current (A): I_n , until steady state conditions are reached	80,0A	P
	- cross-sectional area (mm ²)	25 mm ²	P
	- steady increase from max. $0,2 I_{\Delta n}$ to $2 I_{\Delta n}$ within 30 s (mA)	D4 – 6mA to 60mA D5 - 6mA to 60mA D6 -6mA to 60mA	P
	- tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$ (mA) . :	D4 – 20,6mA/23,2mA D5 – 20,6mA/23,1mA D6 -20,7mA/23,2mA	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.2 addition acc. IEC 62423	Only applicable for RCCBs of type B: Tests at the temperature limits		P
	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		P
	- ambient temperature: +40°C RCCB previously loaded with rated current until steady state conditions are reached		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 (300ms) at: 2 I _{Δn}	D4 – 61ms/61ms D5 – 61ms/57ms D6 - 61ms/61ms	P
	- maximum break time (150ms) at: 4 I _{Δn}	D4 – 35ms/31ms D5 – 36ms/34ms D6 -31ms/33ms	P
	- maximum break time (40ms) at: 10 I _{Δn}	D4 – 19ms/20ms D5 – 20ms/20ms D6 - 20ms/19ms	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:		P
	Test acc. figure 6b		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 (300ms) at: 2 $I_{\Delta n}$	D4 – 71ms/65ms D5 – 71ms/68ms D6 - 72ms/69ms	P
	- maximum break time (150ms) at: 4 $I_{\Delta n}$	D4 – 34ms/35ms D5 – 35ms/34ms D6 – 34ms/34ms	P
	- maximum break time (40ms) at: 10 $I_{\Delta n}$	D4 – 23ms/24ms D5 – 24ms/24ms D6 - 23ms/25ms	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 (300ms) at: 2 $I_{\Delta n}$	D4 – 71ms/71ms D5 – 71ms/71ms D6 - 69ms/72ms	P
	- maximum break time (140ms) at: 4 $I_{\Delta n}$	D4 – 34ms/36ms D5 – 35ms/34ms D6 - 36ms/36ms	P
	- maximum break time (40ms) at: 10 $I_{\Delta n}$	D4 – 21ms/23ms D5 – 23ms/24ms D6 - 21ms/23ms	P
	No value exceeds the relevant specified limiting value		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 +40 °C:	+40 °C	P
	- test current (A): I_n , until steady state conditions are reached	80,0A	P
	- cross-sectional area (mm ²)	25 mm ²	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 (300ms) at: $2 I_{\Delta n}$	D4 – 59ms/60ms D5 – 60ms/60ms D6 - 61ms/58ms	P
	- maximum break time (140ms) at: $4 I_{\Delta n}$	D4 – 32ms/33ms D5 – 34ms/34ms D6 - 33ms/34ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D4 – 19ms/20ms D5 – 20ms/21ms D6 -21ms/21ms	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:		P
	- test current (A): I_n , until steady state conditions are reached		P
	- cross-sectional area (mm ²)		P
	Test acc. figure 6b		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 (300ms) at: $2 I_{\Delta n}$	D4 – 74ms/75ms D5 – 77ms/76ms D6 -73ms/74ms	P
	- maximum break time (140ms) at: $4 I_{\Delta n}$	D4 – 34ms/31ms D5 – 36ms/37ms D6 - 38ms/31ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D4 – 20ms/21ms D5 – 21ms/21ms D6 - 24ms/20ms	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 +40°C:	+40°C	P
	- test current (A): I _n , until steady state conditions are reached	80,0A	P
	- cross-sectional area (mm ²)	25 mm ²	P
	- maximum break time (300ms) at: $2 I_{\Delta n}$	D4 – 65ms/70ms D5 – 66ms/69ms D6 -71ms/71ms	P
	- maximum break time (140ms) at: $4 I_{\Delta n}$	D4 – 32ms/32ms D5 – 32ms/32ms D6 - 32ms/30ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D4 – 24ms/21ms D5 – 24ms/23ms D6 -26ms/27ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
9.17.1	Limiting value of the line voltage (U_x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U_x		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		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 (U_n)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 _{Δn} to I _{Δn} within 30 s (mA)		N/A
	- tripping current between I _{Δno} and I _{Δn} (mA)		N/A
	The RCCB closes on I _{Δn} : no value exceeds the specified limiting value of Table 1 (ms)		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 _{Δn}		N/A
	- maximum break time (ms) at: 2 I _{Δn}		N/A
	- maximum break time (ms) at: 5 I _{Δn}		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: I _{Δn} ; 0,13 s :		N/A
	- minimum non actuating time (ms) at: 2 I _{Δn} ; 0,06 s		N/A
	- minimum non actuating time (ms) at: 5 I _{Δn} ; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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 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 _{Δn}		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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		P
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19.1	Current surge test for all RCCBs (0,5 μ s/100kHz ring wave test)		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	- peak value: 200 A + 10/0%	D-4-203V D-5-203V D-6-204V	P
	- virtual front time: 0,5 μ s \pm 30%		P
	- period of the following oscillatory wave: 10 μ s \pm 20%		P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	The interval between two consecutive applications shall be about 30 s		P
	During the test the RCCB shall not trip	Not trip	P
	- break time (≤ 300 ms) at: $I_{\Delta n}$	D4 – 94ms D5 – 95ms D6 - 91ms	P
9.19.2 9.1.5 addition acc. IEC 62423	Verification of behaviour at surge currents up to 3000A (8/20 μ s surge current)		--
9.19.2.1	Test conditions		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	Peak value: 3000A +10/-0%	D4 – 3040A D5 – 3040A D6 – 3040A	P
	Virtual front time: 0,8 μ s \pm 20%		P
	Virtual time of half value: 20 μ s \pm 20%		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		P
	- break time (ms) at $I_{\Delta n}$	D4 – 93ms D5 – 93ms D6 - 92ms	P
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed		N/A
	- break time (ms) at $I_{\Delta n}$		N/A
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

IEC 62423					
Clause	Requirement + Test			Result - Remark	Verdict
	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				N/A
	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 _{ΔN}	0,138 I _{ΔN}	0,035 I _{ΔN}	0,2 I _{ΔN}	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 _{ΔN}) within 30 s				N/A
	- tripping current between 0,5 I _{ΔN} and 1,4 I _{ΔN} (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

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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 _{Δn} to 2,4 I _{Δn} within 30 s (mA)	D4 – 6mA to 72mA D5 – 6mA to 72mA D6 - 6mA to 72mA	P
	- tripping current between 0,5 I _{Δn} and 2,4 I _{Δn} (mA) :	D4 –22,9mA D5 –23,0mA D6 -22,9mA	P
	Test at 400Hz:		P
	- steady increase from max. 0,2 I _{Δn} to 6 I _{Δn} within 30 s (mA)	D4 – 6mA to 180mA D5 – 6mA to 180mA D6 - 6mA to 180mA	P
	- tripping current between 0,5 I _{Δn} and 6 I _{Δn} (mA) ..:	D4 – 25,3mA D5 – 25,4mA D6 – 25,4mA	P
	Test at 1000Hz:		P
	- steady increase from max. 0,2 I _{Δn} to 14 I _{Δn} within 30 s (mA)	D4 – 6mA to 420mA D5 – 6mA to 420mA D6 - 6mA to 420mA	P
	- tripping current between I _{Δn} and 14 I _{Δn} (mA)	D4 – 48,0mA D5 – 48,1mA D6 – 48,2mA	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 _{Δn} (ms) :	D4 – 12ms D5 – 12ms D6 – 11ms	P
	max. break time:		P
	- general type RCCBs: 0,3s		P
	- S type RCCBs: 0,5s		N/A
	Additional test for type S:		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $14 I_{\Delta n}$; 0,13 s :		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
	- steady increase from max. $0,2 I_{\Delta n}$ to $2 I_{\Delta n}$ within 30 s (mA)	D4 – 6mA 60mA D5 – 6mA 60mA D6 – 6mA 60mA	P
	- tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$ (mA) .. :	D4 – 20,8mA/23,3mA D5 – 20,9mA/23,2mA D6 – 20,9mA/23,2mA	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 (300ms) at: $2 I_{\Delta n}$	D4 – 74mA/67mA D5 – 65mA/62mA D6 – 63mA/67mA	P
	- maximum break time (150ms) at: $4 I_{\Delta n}$	D4 – 36mA/37mA D5 – 32mA/34mA D6 – 33mA/35mA	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D4 – 23mA/22mA D5 – 23mA/24mA D6 – 23mA/26mA	P
	No value exceeds the relevant specified limiting value		P
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$	800A	--
	Test circuit according to figure	Figure 7	--
	Point of test circuit which is directly earthed	Supply side	--
	Grid distance "a" (mm)	25mm	--
	Prospective current (A)	800A	--
	Prospective current obtained (A)	805A	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Power factor	0,93-0,98	--
	Power factor obtained	0,97	--
	Point of initiation: $45^\circ \pm 5^\circ$	45°	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	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 $1,1 U_n$ and shall not exceed 2mA (mA)	D4 -3,12uA D5 - 2,92uA D6 - 2,69uA	P
9.7.3	Dielectric strength test of the main circuit at test voltage $2 U_n$ for 1 min:		--
	a)	D4 - 830V D5 - 830V D6 - 830V	P
	b)	D4 - 830V D5 - 830V D6 - 830V	P
	c)	D4 - 830V D5 - 830V D6 - 830V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	D4 - OK D5 - OK D6 - OK	P
	Making and breaking I_n at U_n	D4 - OK D5 - OK D6 - OK	P
	The RCCB shall trip with a test current of $1,25 I_{\Delta n}$:	D4 - trip D5 - trip D6 - trip	P
	The polyethylene sheet shows no holes		P

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 (U_x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U_x		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		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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		N/A
	No value exceeds the relevant specified limiting value		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		--
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s:		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 $I_{\Delta n}$	$<1,66 I_{\Delta n} = 99,6$ D4 – 73,2 D5 – 73,2 D6 – 73,4	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 – 457V/30s D5 - 457V/30s D6 -457V/30s	P
	RCCB operated at each test:		P
	No change impairing further use:		P
8.8	Resistance to mechanical shock and impact		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		P
	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	D4 – no opening D5 - no opening D6 - no opening	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)		N/A
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		--
	RCCBs shall not operate under specified conditions of overcurrent		N/A
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	6X80=480A/1s	P
	Test repeated three times with an interval of at least 1 min		P
	The RCCB shall not open	D4 - not open D5 - not open D6 - not open	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs functionally dependent on the line voltage at rated voltage (U_n)		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): $6 I_n$ closed by S1 for 1 s	480A/1s	--
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min	D4 - OK D5 - OK D6 - OK	P
	The RCCB shall not open	D4 - not open D5 - not open D6 - not open	P
	RCCBs functionally dependent on the line voltage at rated voltage		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 – 40ms D5 – 37ms D6 - 42ms	P

IEC 62423					
Clause	Requirement + Test	Result - Remark			Verdict
	Tests "D2" 80A, 30mA,3P+N	D2-4	D2-5	D2-6	P
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)	25			--
	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				--
	Prospective current - 500A or - 10 I _n (A)	800A			--
	Prospective current (A)	800A			--
	Prospective current obtained (A)	805A			--
	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 U _n and shall not exceed 2mA (mA)	D2-4 – 2,65uA D2-5 – 2,74uA D2-6 – 2,52uA			P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 U _n for 1 min:				--
	a)	D2-4 – 830V D2-5 – 830V D2-6 – 830V			P
	b)	D2-4 – 830V D2-5 – 830V D2-6 – 830V			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	c)	D2-4 – 830V D2-5 – 830V D2-6 – 830V	P
	d)		N/A
	e)		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 _{Δn}	D2-4 – trip D2-5 – trip D2-6 -trip	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 (U _x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE D (1 samples) I_n=80A I_{Δn} =100mA 1P+N B type	D0-1	P
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Tests "D0"											
8.5	Operating characteristics										--
	For multiple settings of I _{Δn} 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)										N/A
	Type	I _N A	I _{ΔN} A	Standard values of break time and non-actuating time at a residual current equal to							--
				I _{ΔN}	2 I _{ΔN}	5 I _{ΔN}	5 I _{ΔN} 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 _{Δn} to I _{Δn} within 30 s (mA): D0-1- 20mA to 100mA										P
	- tripping current between I _{Δno} and I _{Δn} (mA): D0-1 – 83,4mA										P
9.9.2.2	Verification of the correct operation at closing on residual current										--
	- the RCCB closes on I _{Δn} : no value exceeds the specified limiting value of Table 1 (≤300ms): D0-1 – 119ms										P

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 S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		--
	- maximum break time (300ms) at: $I_{\Delta n}$	D01 – 118ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D01 – 57ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D01 – 27ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D01 – 13ms	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 S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		--
	- maximum break time (40ms) at: 5A (value 1 between 5A and 200A)	D01 – 14ms	P
	- maximum break time (40ms) at: 20A (value 2 between 5A and 200A)	D01 – 11ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		N/A
9.9.2.6	a) Tests repeated at a temperature of -5 °C:		--

IEC 62423			
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 S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (300ms) at: $I_{\Delta n}$	D01 – 116ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D01 – 59ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D01 – 22ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D01 – 13ms	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 :	-	N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during the tests		N/A
9.9.2.5	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): I_n , the pole under test and one other pole loaded with rated current, the current being established shortly before the test	80A	--
	- cross-sectional area (mm ²)	25mm ²	--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (300ms)	D01 – 118ms	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		--
	- maximum break time (300ms) at: $I_{\Delta n}$	D01 – 113ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D01 – 55ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D01 – 26ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (40ms) at: 500 A	D01 – 12ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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): I_n at a temperature of +40 °C: until steady state conditions are reached	80A +40 ° C	--
	- cross-sectional area (mm ²)	25mm ²	--
	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		P
	- maximum break time (300ms) at: $I_{\Delta n}$	D01 – 117ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D01 – 59ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D01 – 21ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D01 – 12ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$ for 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A

IEC 62423					
Clause	Requirement + Test			Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s				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:			0,2 I _{ΔN}	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 _{ΔN}	0,138 I _{ΔN}	0,035 I _{ΔN}	0,2 I _{ΔN}	
	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 _{ΔN}) within 30 s				P
	- tripping current between 0,5 I _{ΔN} and 1,4 I _{ΔN} (mA):			D0-1 –87,8mA	P
9.1.3 addition acc. IEC 62423	Verification of the correct operation in case of sudden appearance of composite residual current				P
	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 _{ΔN} (ms) :			17ms	P
	max. break time:				P
	- general type RCCBs: 40ms				P
	- S type RCCBs: 150ms				N/A
	Additional test for type S:				--
	- minimum non actuating time (ms) at: 7 I _{ΔN} ; 0,05 s :			-	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 _{ΔN} not tested in D ₁ , 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

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)	D0-1- 20mA to 200mA	P
	- tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$ (mA) ...:	D0-1- 63,4mA/63,4mA	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 S1 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 (300ms) at: $2 I_{\Delta n}$	D0-1-54ms/55ms	P
	- maximum break time (150ms) at: $4 I_{\Delta n}$	D0-1-33ms/32ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D0-1-22ms/19ms	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		P
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)		N/A
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)		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 $\alpha = 0^\circ$ (+/-)	D0-1 - +90,1mA/-90,7mA	P
	- angle $\alpha = 90^\circ$ (+/-)	D0-1 - +112mA/-113mA	P
	- angle $\alpha = 135^\circ$ (+/-)	D0-1 - +129mA/-130mA	P
	No value exceeds the relevant specified limiting values		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.3.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle $\alpha = 0^\circ$)		
	RCCBs with $I_{\Delta n} < 0,03$ A:		
	- maximum break time (ms) at: $2 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: $4 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: 0,5 A rms (+/-)		N/A
	- maximum break time (ms) at: 350 A rms (+/-)		N/A
	RCCBs with $I_{\Delta n} = 0,03$ A:		
	- maximum break time (300ms) at: $1,4 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (150ms) at: $2,8 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (40ms) at: 0,35 A rms (+/-)		N/A
	- maximum break time (40ms) at: 350 A rms (+/-) :		N/A
	RCCBs with $I_{\Delta n} > 0,03$ A:		
	- maximum break time (ms) at: $1,4 I_{\Delta n}$ (+/-)	D0-1 - +111ms/-99ms	P
	- maximum break time (ms) at: $2,8 I_{\Delta n}$ (+/-)	D0-1 - +54ms/-51ms	P
	- maximum break time (ms) at: $7 I_{\Delta n}$ (+/-)	D0-1 - +22ms/-26ms	P
	- maximum break time (ms) at: 350 A rms (+/-)	D0-1 - +12ms/-11ms	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): I_n	80,0A	—
	- 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)		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 $\alpha = 0^\circ$ (+/-)	D0-1 - +90,1mA/-90,7mA	P
	- angle $\alpha = 90^\circ$ (+/-)	D0-1 - +112mA/-114mA	P
	- angle $\alpha = 135^\circ$ (+/-)	D0-1 - +129mA/-129mA	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 $\alpha = 0^\circ$ superimposed by smooth direct current of 0,006 A:		

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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)		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 $\alpha = 0^\circ$ (+/-) (+/- 6 mA)	D0-1 - +88,5mA/-93,6mA	P
	No value exceeds the relevant specified limiting values		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE D (1 samples) I_n=80A I_{Δn} =300mA 1P+N B type	D0-2	P
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Tests "D0"											
8.5	Operating characteristics										--
	For multiple settings of I _{Δn} 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)										N/A
	Type	I _N A	I _{ΔN} A	Standard values of break time and non-actuating time at a residual current equal to							--
				I _{ΔN}	2 I _{ΔN}	5 I _{ΔN}	5 I _{ΔN} 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 _{Δn} to I _{Δn} within 30 s (mA): D0-2- 60mA to 300mA										P
	- tripping current between I _{Δno} and I _{Δn} (mA): D0-2 – 240mA										P
9.9.2.2	Verification of the correct operation at closing on residual current										--
	- the RCCB closes on I _{Δn} : no value exceeds the specified limiting value of Table 1 (≤300ms): D0-2 – 101ms										P

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 S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		--
	- maximum break time (300ms) at: $I_{\Delta n}$	D02 – 91ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D02 – 40ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D02 – 24ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D02 – 12ms	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 S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		--
	- maximum break time (40ms) at: 5A (value 1 between 5A and 200A)	D02 – 11ms	P
	- maximum break time (40ms) at: 20A (value 2 between 5A and 200A)	D02– 13ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		N/A
9.9.2.6	a) Tests repeated at a temperature of -5 °C:		--

IEC 62423			
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 S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (300ms) at: $I_{\Delta n}$	D02 – 91ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D02 – 40ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D02 – 24ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D02 – 12ms	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 :	-	N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during the tests		N/A
9.9.2.5	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): I_n , the pole under test and one other pole loaded with rated current, the current being established shortly before the test	80A	--
	- cross-sectional area (mm ²)	25mm ²	--
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (300ms)	D02 – 90ms	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		--
	- maximum break time (300ms) at: $I_{\Delta n}$	D02 – 91ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D02 – 40ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D02 – 23ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (40ms) at: 500 A	D02 – 12ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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): I_n at a temperature of +40 °C: until steady state conditions are reached	80A +40 °C	--
	- cross-sectional area (mm ²)	25 mm ²	--
	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		P
	- maximum break time (300ms) at: $I_{\Delta n}$	D02 – 91ms	P
	- maximum break time (150ms) at: $2 I_{\Delta n}$	D02 – 37ms	P
	- maximum break time (40ms) at: $5 I_{\Delta n}$	D02– 24ms	P
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (40ms) at: 500 A	D02 – 12ms	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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$ for 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A

IEC 62423					
Clause	Requirement + Test			Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s				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:			0,2 I _{ΔN}	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 _{ΔN}	0,138 I _{ΔN}	0,035 I _{ΔN}	0,2 I _{ΔN}	
	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 _{ΔN}) within 30 s				P
	- tripping current between 0,5 I _{ΔN} and 1,4 I _{ΔN} (mA):			D0-2 – 290mA	P
9.1.3 addition acc. IEC 62423	Verification of the correct operation in case of sudden appearance of composite residual current				P
	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 _{Δn} (ms) :			D0-2- 16ms	P
	max. break time:				P
	- general type RCCBs: 40ms				P
	- S type RCCBs: 150ms				N/A
	Additional test for type S:				--
	- minimum non actuating time (ms) at: 7 I _{Δn} ; 0,05 s :			-	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 _{Δn} not tested in D ₁ , 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

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)	D0-2- 60mA to 600mA	P
	- tripping current between $0,5 I_{\Delta n}$ and $2 I_{\Delta n}$ (mA) .. :	D0-2- 225mA/229mA	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 S1 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 (300ms) at: $2 I_{\Delta n}$	D0-2-56ms/53ms	P
	- maximum break time (150ms) at: $4 I_{\Delta n}$	D0-2- 32ms/32ms	P
	- maximum break time (40ms) at: $10 I_{\Delta n}$	D0-2-21ms/23ms	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		P
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)		N/A
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)		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 $\alpha = 0^\circ$ (+/-)	D0-2 - +283mA/-272mA	P
	- angle $\alpha = 90^\circ$ (+/-)	D0-2 - +283mA/-284mA	P
	- angle $\alpha = 135^\circ$ (+/-)	D0-2 - +331mA/-333mA	P
	No value exceeds the relevant specified limiting values		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.3.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle $\alpha = 0^\circ$)		
	RCCBs with $I_{\Delta n} < 0,03$ A:		
	- maximum break time (ms) at: $2 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: $4 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (ms) at: 0,5 A rms (+/-)		N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:		N/A
	RCCBs with $I_{\Delta n} = 0,03$ A:		
	- maximum break time (300ms) at: $1,4 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (150ms) at: $2,8 I_{\Delta n}$ (+/-)		N/A
	- maximum break time (40ms) at: 0,35 A rms (+/-)		N/A
	- maximum break time (40ms) at: 350 A rms (+/-) :		N/A
	RCCBs with $I_{\Delta n} > 0,03$ A:		
	- maximum break time (ms) at: $1,4 I_{\Delta n}$ (+/-)	D0-2 - +92ms/-93ms	P
	- maximum break time (ms) at: $2,8 I_{\Delta n}$ (+/-)	D0-2 - +42ms/-41ms	P
	- maximum break time (ms) at: $7 I_{\Delta n}$ (+/-)	D0-2 - +27ms/-24ms	P
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D0-2 - +10ms/-9ms	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): I_n	80,0A	—
	- 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)		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 $\alpha = 0^\circ$ (+/-)	D0-2 - +283mA/-271mA	P
	- angle $\alpha = 90^\circ$ (+/-)	D0-2 - +283mA/-284mA	P
	- angle $\alpha = 135^\circ$ (+/-)	D0-2 - +291mA/-333mA	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 $\alpha = 0^\circ$ superimposed by smooth direct current of 0,006 A:		

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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)		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 $\alpha = 0^\circ$ (+/-) (+/- 6 mA):	D0-2 - +298mA/-274mA	P
	No value exceeds the relevant specified limiting values		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE E (3 samples) In=80A I _{Δn} =30mA 1P+N B type	E-1	E-2	E-3	
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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	10,0kA			--
	Test circuit according to figure	Figure 7			--
	Point of test circuit which is directly earthed	Supply side			--
	Grid distance "a" (mm)	50mm			--
	Silver wire diameter (mm) or fuse	∅0,85			--
	Prospective current (A)	10,0kA			--
	Prospective current obtained (A)	10,2kA			--
	Power factor	0,45~0,50			--
	Power factor obtained	0,48			--
	Point of initiation: 45° ± 5°	45°			P
	Verification of I ² t (kA ² s) and I _p (kA) prior to testing ((≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance	I _p =5,61kA I ² t =34,1kA ² s			P
	Test sequence: O-t-CO				P
	I ² t (kA ² s); I _p (kA)	E1 – 5,65kA/81,9kA ² s E2 – 5,34 kA/50,1kA ² s E3 – 5,30kA/31,1kA ² s			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 U _n and shall not exceed 2mA (mA)	E1 – 2,76uA E2 – 2,51uA E3 – 2,62uA			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 U _n for 1 min:				--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	a)	E1 – 480V E2 - 480V E3 -480V	P
	b)	E1 – 480V E2 - 480V E3 -480V	P
	c)	E1 – 480V E2 - 480V E3 -480V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	E1 - OK E2 - OK E3 - OK	P
	Making and breaking In at Un	E1 – 240V/80A E2 – 240V/80A E3 - 240V/80A	P
	The RCCB shall trip with a test current of $1,25 I_{\Delta n}$ (ms)	E1 – 74ms E2 – 91ms E3 - 85ms	P
	The polyethylene sheet shows no holes		
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 (U_x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U_x		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		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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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): I_m	800A	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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)	35mm	--
	Prospective current (A)	800A	--
	Prospective current obtained (A)	805A	--
	Power factor	0,93-0,98	--
	Power factor obtained	0,97	--
	Point of initiation: $45^\circ \pm 5^\circ$	45°	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 $1,1 U_n$ and shall not exceed 2mA (mA)	E1 – 2,92uA E2 – 2,87uA E3 – 3,05uA	P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		--
	a)	E1 – 480V E2 - 480V E3 -480V	P
	b)	E1 – 480V E2 - 480V E3 -480V	P
	c)	E1 – 480V E2 - 480V E3 -480V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	E1 - OK E2 - OK E3 - OK	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at U_n	E1 – OK E2 – OK E3 - OK	P
	The RCCB shall trip with a test current of $1,25 I_{\Delta n}$ (ms)	E1 – 86ms E2 – 92ms E3 – 97ms	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 (U_x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U_x		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		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 (U_n)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 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: $I_{\Delta n}$		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 (300ms)	E1 – 46ms E2 – 53ms E3 - 51ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE E (3 samples) In=80A I_{Δn}=30mA 3P+N B type	E-4	E-5	E-6	
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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	10,0kA			--
	Test circuit according to figure	Figure 7			--
	Point of test circuit which is directly earthed	Supply side			--
	Grid distance "a" (mm)	50mm			--
	Silver wire diameter (mm) or fuse	Φ0,85			--
	Prospective current (A)	10,0kA			--
	Prospective current obtained (A)	10,2kA			--
	Power factor	0,45~0,50			--
	Power factor obtained	0,48			--
	Point of initiation: 45° ± 5°	45°			P
	Verification of I ² t (kA ² s) and I _p (kA) prior to testing ((≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance	I _p =5,61kA I ² t =34,1kA ² s			P
	Test sequence: O-t-CO				P
	I ² t (kA ² s); I _p (kA)	E1 – 5,16kA/34,5kA ² s E2 – 5,38kA/46,4kA ² s E3 – 5,34kA/33,6kA ² s			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 U _n and shall not exceed 2mA (mA)	E1 – 2,94uA E2 – 2,52uA E3 – 2,74uA			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 U _n for 1 min:				--
	a)	E4 – 830V E5 - 830V E6 -830V			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	b)	E4 – 830V E5 - 830V E6 -830V	P
	c)	E4 – 830V E5 - 830V E6 -830V	P
	d)		N/A
	e)		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 _{Δn} (ms)	E4– 74ms E5 – 91ms E6 -85ms	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 (U _x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta n0}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s:		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s:		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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): I_m	800A	--
	Test circuit according to figure	figure 7	--
	Residual operating current (A): $10 I_{\Delta n}$	300mA	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Point of test circuit which is directly earthed	Supply side	--
	Grid distance "a" (mm)	35mm	--
	Prospective current (A)	800A	--
	Prospective current obtained (A)	805A	--
	Power factor	0,93-0,98	--
	Power factor obtained	0,97	--
	Point of initiation: $45^\circ \pm 5^\circ$	45°	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 $1,1 U_n$ and shall not exceed 2mA (mA)	E4 – 3,16uA E5 – 3,22uA E6 – 3,17uA	P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		--
	a)	E4 – 830V E5 - 830V E6 - 830V	P
	b)	E4 – 830V E5 - 830V E6 -830V	P
	c)	E4 – 830V E5 - 830V E6 -830V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	E4 - OK E5 - OK E6 - OK	P
	Making and breaking I_n at U_n	E4 - OK E5 - OK E6 - 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)	E4 – 78ms E5 – 86ms E6 – 91ms	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 (U_x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U_x		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		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 (U_n)		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.1	- steady increase from 0,2 I _{Δn} to I _{Δn} within 30 s (mA)		N/A
	- tripping current between I _{Δno} and I _{Δn} (mA)		N/A
	The RCCB closes on I _{Δn} : no value exceeds the specified limiting value of Table 1 (ms)		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 _{Δn}		N/A
	- maximum break time (ms) at: 2 I _{Δn}		N/A
	- maximum break time (ms) at: 5 I _{Δn}		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: I _{Δn} ; 0,13 s :		N/A
	- minimum non actuating time (ms) at: 2 I _{Δn} ; 0,06 s		N/A
	- minimum non actuating time (ms) at: 5 I _{Δn} ; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		P
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 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 _{Δn}		N/A
	- maximum break time (ms) at: 2 I _{Δn}		N/A
	- maximum break time (ms) at: 5 I _{Δn}		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 (300ms)	E4 – 57ms E5 – 49ms E6 - 46ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) In=80A IΔn =30mA 1P+N B type	F-1	F-2	F-3	
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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	800A			--
	Test circuit according to figure	Figure 7			--
	Point of test circuit which is directly earthed	Supply side			--
	Grid distance "a" (mm)	35mm			--
	Silver wire diameter (mm) or fuse	0,85mm			--
	Prospective current (A)	800A			--
	Prospective current obtained (A)	805A			--
	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	F1 – 2,74uA F2 – 2,43uA F3 – 2,37uA			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				--
	a)	F1 – 480V F2 - 480V F3 - 480V			P
	b)	F1 – 480V F2 - 480V F3 - 480V			P
	c)	F1 – 480V F2 - 480V F3 - 480V			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	d)		N/A
	e)		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 – 94ms F2 – 83ms F3—88ms	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 (U_x):		----
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U_x		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		N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A

IEC 62423			
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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta n0}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		P
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): $I_{\Delta c}$:	10kA	--
	Test circuit according to figure	figure 7	--
	Point of test circuit which is directly earthed	Supply side	--
	Grid distance "a" (mm)	50mm	--
	Silver wire diameter (mm) or fuse	0.85mm	--
	Prospective current (A)	10kA	--
	Prospective current obtained (A)	10,2kA	--
	Power factor	0,45~0,50	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Power factor obtained	0,48	--
	Point of initiation: $45^\circ \pm 5^\circ$	45°	P
	Verification of I^2t (kA ² s) and I_p (kA) prior to testing ($\geq 1x \leq 1,1x$ values of table 15), RCCB replaced by a connection having negligible impedance	$I_p = 5,61kA$ $I^2t = 34,1kA^2s$	
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA ² s); I_p (kA)	F1 – 5,27kA ² s/32,4kA F2 – 5,22kA ² s/32,1kA F3 – 5,44kA ² s/31,7kA	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 $1,1 U_n$ and shall not exceed 2mA (mA)	F1 – 3,12uA F2 – 2,94uA F3 – 2,83uA	P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		--
	a)	F1 – 480V F2 – 480V F3 - 480V	P
	b)	F1 – 480V F2 – 480V F3 - 480V	P
	c)	F1 – 480V F2 – 480V F3 - 480V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	F1 - OK F2 – OK F3 - OK	P
	Making and breaking I_n at U_n	F1 - OK F2 - OK F3 - 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)	F1 – 93ms F2 – 85ms F3 – 83ms	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 (U_x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U_x		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		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 (U_n)		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.1	- steady increase from 0,2 I _{Δn} to I _{Δn} within 30 s (mA)		N/A
	- tripping current between I _{Δno} and I _{Δn} (mA)		N/A
	The RCCB closes on I _{Δn} : no value exceeds the specified limiting value of Table 1 (ms)		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 _{Δn}		N/A
	- maximum break time (ms) at: 2 I _{Δn}		N/A
	- maximum break time (ms) at: 5 I _{Δn}		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: I _{Δn} ; 0,13 s :		N/A
	- minimum non actuating time (ms) at: 2 I _{Δn} ; 0,06 s		N/A
	- minimum non actuating time (ms) at: 5 I _{Δn} ; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		P
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 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 _{Δn}		N/A
	- maximum break time (ms) at: 2 I _{Δn}		N/A
	- maximum break time (ms) at: 5 I _{Δn}		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		P
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 – 47ms F2 – 52ms F3 - 42ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) In=16A IΔn =300mA 1P+N B type	F-4	F-5	F-6	
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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	500A			--
	Test circuit according to figure	Figure 7			--
	Point of test circuit which is directly earthed	Supply side			--
	Grid distance "a" (mm)	35mm			--
	Silver wire diameter (mm) or fuse	0,35mm			--
	Prospective current (A)	500A			--
	Prospective current obtained (A)	508A			--
	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 (mA)	F4 – 2,73uA F5 – 2,34uA F6 – 2,52uA			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				--
	a)	F4 – 480V F5 - 480V F6 - 480V			P
	b)	F4 – 480V F5 - 480V F6 - 480V			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	c)	F4 – 480V F5 - 480V F6 - 480V	P
	d)		N/A
	e)		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 _{Δn} (ms)	F4 – 82ms F5 – 86ms F6 – 78ms	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 (U _x):		----
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		P
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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		P
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): $I_{\Delta c}$:	10kA	--
	Test circuit according to figure	figure 7	--
	Point of test circuit which is directly earthed	Supply side	--
	Grid distance "a" (mm)	50mm	--
	Silver wire diameter (mm) or fuse	0.85mm	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current (A)	10kA	--
	Prospective current obtained (A)	10,2kA	--
	Power factor	0,45~0,50	--
	Power factor obtained	0,48	--
	Point of initiation: $45^\circ \pm 5^\circ$		P
	Verification of I^2t (kA ² s) and I_p (kA) prior to testing ($\geq 1x \leq 1,1x$ values of table 15), RCCB replaced by a connection having negligible impedance	$I^2t = 1,595$ kA ² s $I_p = 2,09$ kA	P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA ² s); I_p (kA)	F4 – 1,99kA ² s/2,01kA F5 – 1,98kA ² s/1,54kA F6 – 2,04kA ² s/2,19kA	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 $1,1 U_n$ and shall not exceed 2mA (mA)	F4 – 3,05uA F5 – 3,13uA F6 – 2,96uA	P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		--
	a)	F4 – 480V F5 – 480V F6 - 480V	P
	b)	F4 – 480V F5 – 480V F6 - 480V	P
	c)	F4 – 480V F5 – 480V F6 - 480V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	F4 - OK F5 – OK F6 - OK	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 _{Δn} (ms)	F4 - 81ms F5 - 78ms F6 - 86ms	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 (U _x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		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 (U _n)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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 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: $I_{\Delta n}$		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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)	F4 – 37ms F5 – 46ms F6 - 32ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) In=80A IΔn =30mA 3P+N B type	F-7	F-8	F-9	
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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	800A			--
	Test circuit according to figure	Figure 7			--
	Point of test circuit which is directly earthed	Supply side			--
	Grid distance "a" (mm)	35mm			--
	Silver wire diameter (mm) or fuse	0,85mm			--
	Prospective current (A)	800A			--
	Prospective current obtained (A)	805A			--
	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 (mA)	F7 – 2,76uA F8 – 2,85uA F9 – 2,81uA			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				--
	a)	F7 – 830V F8 – 830V F9 - 830V			P
	b)	F7 – 830V F8 – 830V F9 - 830V			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	c)	F7 – 830V F8 – 830V F9 - 830V	P
	d)		N/A
	e)		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 _{Δn} (ms)	F7 – 82ms F8 – 73ms F9 – 79ms	P
	The polyethylene sheet shows no holes		
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 (U _x):		----
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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): $I_{\Delta c}$:	10kA	--
	Test circuit according to figure	figure 7	--
	Point of test circuit which is directly earthed	Supply side	--
	Grid distance "a" (mm)	50mm	--
	Silver wire diameter (mm) or fuse	0.85mm	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current (A)	10kA	--
	Prospective current obtained (A)	10,2kA	--
	Power factor	0,45~0,50	--
	Power factor obtained	0,48	--
	Point of initiation: $45^\circ \pm 5^\circ$		P
	Verification of I^2t (kA ² s) and I_p (kA) prior to testing ($\geq 1x \leq 1,1x$ values of table 15), RCCB replaced by a connection having negligible impedance	$I^2t = 34,1 \text{ kA}^2\text{s}$ $I_p = 5,61 \text{ kA}$	P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA ² s); I_p (kA)	F7 – 32,4kA ² s/5,57kA F8 – 34,1kA ² s/5,33kA F9 – 32,5kA ² s/5,21kA	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 $1,1 U_n$ and shall not exceed 2mA (mA)	F7 – 3,45uA F8 – 3,62uA F9 – 3,52uA	P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		--
	a)	F7 – 830V F8 – 830V F9 - 830V	P
	b)	F7 – 830V F8 – 830V F9 - 830V	P
	c)	F7 – 830V F8 – 830V F9 - 830V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	F7 - OK F8 – OK F9 - OK	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 _{Δn} (ms)	F7 - 74ms F8 - 81ms F9 - 76ms	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 (U _x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		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 (U _n)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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 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: $I_{\Delta n}$		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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 – 47ms F8 – 52ms F9 - 46ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) In=16A IΔn =300mA 3P+N B type	F-10	F-11	F-12	P
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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	500A			--
	Test circuit according to figure	Figure 7			--
	Point of test circuit which is directly earthed	Supply side			--
	Grid distance "a" (mm)	45mm			--
	Silver wire diameter (mm) or fuse	0,35mm			--
	Prospective current (A)	500A			--
	Prospective current obtained (A)	508A			--
	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				
	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 (mA)	F10 – 2,82uA F11 – 3,04uA F12 – 2,88uA			P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:				--
	a)	F10 – 830V F11 - 830V F12 - 830V			P
	b)	F10 – 830V F11 - 830V F12 - 830V			P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	c)	F10 – 830V F11 - 830V F12 - 830V	P
	d)		N/A
	e)		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 _{Δn} (ms)	F10 – 31ms F11 – 32ms F12 –31ms	P
	The polyethylene sheet shows no holes		
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 (U _x):		----
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) ..		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (U_n)		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)		N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA)		N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms)		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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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 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: $I_{\Delta n}$		N/A
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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): $I_{\Delta c}$:	10kA	--
	Test circuit according to figure	figure 7	--
	Point of test circuit which is directly earthed	Supply side	--
	Grid distance "a" (mm)	50mm	--
	Silver wire diameter (mm) or fuse	0.85mm	--

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current (A)	10kA	--
	Prospective current obtained (A)	10,2kA	--
	Power factor	0,45~0,50	--
	Power factor obtained	0,48	--
	Point of initiation: $45^\circ \pm 5^\circ$		P
	Verification of I^2t (kA ² s) and I_p (kA) prior to testing ($\geq 1x \leq 1,1x$ values of table 15), RCCB replaced by a connection having negligible impedance	$I^2t = 2,09kA^2s$ $I_p = 1,595 kA$	P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA ² s); I_p (kA)	F10 – 1,53kA ² s/1,99kA F11 – 1,56kA ² s/2,02kA F12 – 1,56kA ² s/2,02kA	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 $1,1 U_n$ and shall not exceed 2mA (mA)	F10 – 3,49uA F11 – 3,22uA F12 – 3,43uA	P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		--
	a)	F10 – 830V F11 – 830V F12 - 830V	P
	b)	F10 – 830V F11 – 830V F12 - 830V	P
	c)	F10 – 830V F11 – 830V F12 - 830V	P
	d)		N/A
	e)		N/A
	No flashover or breakdown	F10 - OK F11 – OK F12 - OK	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 _{Δn} (ms)	F10 – 33ms F11 – 35ms F12 – 36ms	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 (U _x):		--
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:		N/A
	- all values less than 0,85 times the rated voltage (V)		N/A
	- tripping test at test voltage (V) with I _{Δn} and operating according to Table 1 (ms)		N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below U _x		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		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 (U _n)		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	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 _{Δn} to I _{Δn} within 30 s (mA)		N/A
	- tripping current between I _{Δno} and I _{Δn} (mA)		N/A
	The RCCB closes on I _{Δn} : no value exceeds the specified limiting value of Table 1 (ms)		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 _{Δn}		N/A
	- maximum break time (ms) at: 2 I _{Δn}		N/A
	- maximum break time (ms) at: 5 I _{Δn}		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		--
	- minimum non actuating time (ms) at: I _{Δn} ; 0,13 s :		N/A
	- minimum non actuating time (ms) at: 2 I _{Δn} ; 0,06 s		N/A
	- minimum non actuating time (ms) at: 5 I _{Δn} ; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		N/A
	No tripping during tests		
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 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 _{Δn}		N/A

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $2 I_{\Delta n}$		N/A
	- maximum break time (ms) at: $5 I_{\Delta n}$		N/A
	- maximum break time (ms) at: 0,25 A (if applicable)		N/A
	- maximum break time (ms) at: 500 A		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 :		N/A
	- minimum non actuating time (ms) at: $2 I_{\Delta n}$; 0,06 s		N/A
	- minimum non actuating time (ms) at: $5 I_{\Delta n}$; 0,05 s		N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s		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)	F10– 36ms F11 – 43ms F12 - 46ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE G (3 samples) In=80A I Δ n =30mA 1P+N B type	G0-1	G0-2	G0-3	
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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			P
	- test temperature: upper temperature 55 °C \pm 2 °C			P
	Initial verification:			P
9.9.2.3	- maximum break time at I Δ n (\leq 300ms)	G0-1 – 132ms G0-2 – 129ms G0-3 – 127ms		P
	No value exceeds the specified limiting value			P
	Additional test for type S:			--
	- minimum non actuating time (ms) at: I Δ n; 0,13 s :			N/A
	No tripping during tests			N/A
	Climatic test: no tripping during 28 cycles test	G0-1 –no trip G0-2 – no trip G0-3 – no trip		P
	Final verification: the RCCB shall trip with a test current of 1,25 I Δ n	G0-1 – trip G0-2 – trip G0-3 – trip		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 Δ n with smooth direct current maximum break time (ms)	G0-1 – 96ms G0-2 – 92ms G0-3 – 89ms		P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE G (3 samples) In=16A IΔn =300mA 1P+N B type	G0-4	G0-5	G0-6	
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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		P
	- test temperature: upper temperature 55 °C ± 2 °C		P
	Initial verification:		P
9.9.2.3	- maximum break time at IΔn (≤300ms)	G0-4 – 112ms G0-5 – 108ms G0-6 – 104ms	P
	No value exceeds the specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: IΔn; 0,13 s :		N/A
	No tripping during tests		N/A
	Climatic test: no tripping during 28 cycles test	G0-4 –no trip G0-5 – no trip G0-6 – no trip	P
	Final verification: the RCCB shall trip with a test current of 1,25 IΔn	G0-4 – trip G0-5 – trip G0-6 – trip	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 IΔn with smooth direct current maximum break time (ms)	G0-4 – 72ms G0-5 – 76ms G0-6 – 69ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE G (3 samples) In=80A IΔn =30mA 3P+N B type	G0-7	G0-8	G0-9	
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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		P
	- test temperature: upper temperature 55 °C ± 2 °C		P
	Initial verification:		P
9.9.2.3	- maximum break time at IΔn (≤300ms)	G0-7 – 107ms G0-8 – 109ms G0-9 – 107ms	P
	No value exceeds the specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: IΔn; 0,13 s :		N/A
	No tripping during tests		P
	Climatic test: no tripping during 28 cycles test	G0-7 –no trip G0-8 – no trip G0-9 – no trip	P
	Final verification: the RCCB shall trip with a test current of 1,25 IΔn (ms)	G0-7 – trip G0-8 – trip G0-9 – trip	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 IΔn with smooth direct current maximum break time (ms)	G0-7 – 69ms G0-8 – 76ms G0-9 – 81ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE G (3 samples) In=16A IΔn =300mA 3P+N B type	G0-10	G0-11	G0-12	
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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		P
	- test temperature: upper temperature 55 °C ± 2 °C		P
	Initial verification:		P
9.9.2.3	- maximum break time at IΔn (≤300ms)	G0-10 – 96ms G0-11 – 97ms G0-12 – 98ms	P
	No value exceeds the specified limiting value		P
	Additional test for type S:		--
	- minimum non actuating time (ms) at: IΔn; 0,13 s :		N/A
	No tripping during tests		P
	Climatic test: no tripping during 28 cycles test	G0-10 – no trip G0-11 – no trip G0-12 – no trip	P
	Final verification: the RCCB shall trip with a test current of 1,25 IΔn (ms)	G0-10 – trip G0-11 – trip G0-12 – trip	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 IΔn with smooth direct current maximum break time (ms)	G0-10 – 65ms G0-11 – 72ms G0-12 – 69ms	P

IEC 62423			
Clause	Requirement + Test	Result - Remark	Verdict
	TEST SEQUENCE H (3 samples) In=80A IΔn =30mA 3P+N B type		
IEC 61543:			--
table4-T1.1	Harmonics, interharmonics		N/A
table4-T1.2	Signalling voltage		N/A
table5-T2.3	Conducted unidirectional transients of the ms and μs time scale		P
	Test results of test sequence H:		--
	see test report No. :	See attachment N°2	--
	Testing location / address	Zhejiang Fangyuan Test Group CO., Ltd. Guangqiong Rd, Jiaying City, Zhejiang Province. P.R. China	--
	TEST SEQUENCE I (3 samples)		
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. :	See attachment N°2	--
	Testing location / address	Zhejiang Fangyuan Test Group CO., Ltd. Guangqiong Rd, Jiaying City, Zhejiang Province. P.R. China	--
	TEST SEQUENCE J (3 samples)		
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. :	See attachment N°2	--
	Testing location / address	Zhejiang Fangyuan Test Group CO., Ltd. Guangqiong Rd, Jiaying City, Zhejiang Province. P.R. 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 and 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 --- ---	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
	D ₁	9.9.3 9.17 9.19 --- --- 9.11.2.3 a)b) 9.16 9.12 9.18	9.1.2 9.1.3 9.1.7 No 9.1.5 9.1.6 9.1.4 No No No No No
D ₂	9.11.2.3 c)	No	Type A residual current devices 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 _{Δm} Test device Resistance to mechanical shock and impact Non-operating current under overcurrent conditions
E	9.11.2.4 a)	No	Verification of the suitability of RCCBs for use in IT-systems
	9.11.2.2	No	Coordination at I _{nc} Performance at I _m
F	9.11.2.4 b)	No	Coordination at I _m
	9.11.2.4 c)	No	Coordination at I _{Δc}
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.			

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 and 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 --- --- ---	No 9.1.2 9.1.3 9.2.1.7.1	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
	D ₁	9.9.3 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	Type A residual current devices 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	No	Conducted sine-wave voltages or currents	
	IEC 61543 Table 5 -T2.5	No	Radiated electromagnetic field	
	IEC 61543 Table 5 -T2.2	No	Fast transients (burst)	
J	IEC 61543 Table 5 - T2.6	No	Conducted common mode disturbances in the frequency range lower than 150 kHz	
	IEC 61543 Table 6 -T3.1	No	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.				

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.

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 _{ΔN}	1 max. rating I _N min. rating I _{ΔN}	1 max. rating I _N min. rating I _{ΔN}
A ₂	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
B	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
C	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
D ₀ + D ₁	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
D ₀	1 for all other ratings of I _{ΔN}		
D ₂	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
E	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
F	3 max. rating I _N min. rating I _{ΔN} 3 min. rating I _N max. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN} 3 min. rating I _N max. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN} 3 min. rating I _N max. rating I _{ΔN}
G ^{j)}	3 max. rating I _N min. rating I _{ΔN} 3 min. rating I _N max. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN} 3 min. rating I _N max. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN} 3 min. rating I _N max. rating I _{ΔN}
H	3 ^{h)} samples of the same rating I _N chosen at random min. rating I _{ΔN}		
I	3 ^{h)} samples of the same rating I _N chosen at random min. rating I _{ΔN}		
J	3 ^{h)} samples of the same rating I _N chosen at random min. rating I _{ΔN}		
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 _{ΔN} is submitted, min. rating I _{ΔN} and max. rating I _{ΔN} are replaced by I _{ΔN} .		
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 for test max. rating I _N and minimum rating I _{ΔN} does not cover all the possible range of RCBOs, the minimum I _{ΔN} shall in any case be chosen for the test		

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 _{ΔN}	1 max. rating I _N min. rating I _{ΔN}	1 max. rating I _N min. rating I _{ΔN}
D ₀	1 for all other ratings of I _{ΔN} with max. I _{ΔN}		

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.

	ANNEX B DETERMINATION OF CLEARANCES AND CREEPAGE DISTANCES	--
B.1	General	P
	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	P
	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	N/A
	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.	N/A
B.4	Creepage distances split by floating conductive part	N/A
	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).	N/A
B.5	Measurement of creepage distances and clearances	P
	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.	N/A
	If the associated clearance is less than 3 mm, the minimum dimension X may be reduced to one third of this clearance.	N/A
	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:	P
	- 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

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 ($0,05 \pm 0,01$) 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.	N/A
	The sheet should have the following physical properties: Density at 23 °C: $0,92 \pm 0,05$ g/cm ³ 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

	ANNEX D ROUTINE TESTS	N/A
	ANNEX E ROUTINE TESTS FOR TYPE F AND B RCCBS	N/A
J	ANNEX J Particular requirements for RCCBs with screwless type terminals for external copper conductors	N/A
K	ANNEX K Particular requirements for RCCBs with flat quick-connect terminations	N/A
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	

IEC62423C - ATTACHMENT			
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
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CENELEC COMMON MODIFICATIONS (EN)				P
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%			--
<i>replace:</i>	TEST SEQUENCE "A₁" <i>replace clause 6 by</i>	A ₁ -1 (1P+N)	A ₁ -2 (3P+N)	P
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			P
b)	Type designation, catalogue number or serial number	GYL9		P
c)	Rated voltage(s) with the symbol ~	230/240V~	400/415V~	P
d)	Rated frequency, if the RCCB is designed for frequencies other than 50 Hz			P
e)	rated current	50/60Hz		P
f)	Rated residual operating current (I _{Δn}) in A or in mA	0,03A		P

IEC62423C - ATTACHMENT				
Clause	Requirement + Test	Result - Remark		Verdict
h) *)	Rated making and breaking capacity (I_m)	800A	800A	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)	10000A	10000A	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			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)			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  or 			P
	- RCBOs of type F with the symbol  or 			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"			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.			N/A
	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 "O" and closed position by " "			N/A
	Additional national symbols are allowed Provisionally the use of national indications only is allowed			N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	These indication visible when RCCB is installed		
	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		P
	Terminals for neutral circuit N	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:		N/A
	- 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):		P
	- no markings		P
	For non-universal terminals:		N/A
	- 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		P
6.Z2	ADDITIONAL MARKING		--
	Additional marking to other standards (EN or IEC or other) or additional requirements are allowed under the following conditions:		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- The RCCB shall comply with all the requirements of the additional standard.		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
<i>delete</i>	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 <i>add</i>	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		--
<i>modify</i>	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	or terminals for external untreated aluminium conductors and with aluminium screw type		--

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
<i>delete</i>	terminals for use with copper or with aluminium conductors according to Annex L.		
8.1.Z1 <i>add</i>	Non-interchangeability		N/A
	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 <i>add</i>	Mechanical mounting of plug-in type RCCBs		N/A
	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 <i>add</i>	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 <i>add</i>	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 "A₂"		--
9.14	Glow-wire test		--
<i>add</i>	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

IEC62423C - ATTACHMENT					
Clause	Requirement + Test	Result - Remark			Verdict
	TEST SEQUENCE "B" 80A, 30mA, 1P+N, B type	B1	B2	B3	P
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION				--
8.3	Dielectric properties and isolating capability				--
	RCCBs have adequate dielectric properties				P
9.7 <i>modify</i>	Test of dielectric properties and isolating capability				--
9.7.7.4.1 <i>modify</i>	rated impulse withstand voltage [kV]:	4kV			--
	see level of test laboratory [m]	5m			--
	test voltage (acc. Table 22, <i>modified</i>) [kV]:				--
9.7.7.4.3 <i>modify</i>	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 <i>modify</i>	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 $\geq 2 \text{ M}\Omega$	>550	>550	>550	P
	b) between each pole and the others connected together (electronic components, connected between poles being disconnected) $\geq 2 \text{ M}\Omega$	>550	>550	>550	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 $\geq 5 \text{ M}\Omega$	>550	>550	>550	P
	d) between the frame and a metal foil in contact with the inner surface of the lining of insulating material $\geq 5 \text{ M}\Omega$				N/A
9.7.3 <i>modify</i>	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

IEC62423C - ATTACHMENT					
Clause	Requirement + Test	Result - Remark			Verdict
	c).....2000 V	OK	OK	OK	P
	d)2500 V	-	-	-	N/A
	No flashover or breakdown				P
9.7.7.2 <i>modify</i>	delete in table 16 the line beginning with "2,5" rated impulse withstand voltage [kV]:	4kV			P
	see level of test laboratory [m]	5m			P
	test voltage (acc. Table 16) [kV]:	6,2kV			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
9.23 <i>modify</i>	VERIFICATION OF AGEING				--
	TEST SEQUENCE "B" 80A, 30mA, 3P+N, B type	B4	B5	B6	P
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION				--
8.3	Dielectric properties and isolating capability				--
	RCCBs have adequate dielectric properties				P
9.7 <i>modify</i>	Test of dielectric properties and isolating capability				--
9.7.7.4.1 <i>modify</i>	rated impulse withstand voltage [kV]:	4kV			--
	see level of test laboratory [m]	5m			--
	test voltage (acc. Table 22, <i>modified</i>) [kV]:				--
9.7.7.4.3 <i>modify</i>	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	Insulation resistance of the main circuit measured between 30 and 60 min after this treatment with	B4	B5	B6	--

IEC62423C - ATTACHMENT					
Clause	Requirement + Test	Result - Remark			Verdict
<i>modify</i>	500 V DC after 5 s:	[MΩ]	[MΩ]	[MΩ]	
	a) between the terminals which are electrically connected together when the RCCB is in the closed position $\geq 2 \text{ M}\Omega$	>550	>550	>550	P
	b) between each pole and the others connected together (electronic components, connected between poles being disconnected) $\geq 2 \text{ M}\Omega$	>550	>550	>550	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..... $\geq 5 \text{ M}\Omega$	>550	>550	>550	P
	d) between the frame and a metal foil in contact with the inner surface of the lining of insulating material $\geq 5 \text{ M}\Omega$				N/A
9.7.3 <i>modify</i>	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 <i>modify</i>	delete in table 16 the line beginning with "2,5" rated impulse withstand voltage [kV]:	4kV			P
	see level of test laboratory [m]	5m			P
	test voltage (acc. Table 16) [kV]:	6,2kV			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
9.23 <i>modify</i>	VERIFICATION OF AGEING				--
	TEST SEQUENCE "C" 80A, 30mA, 1P+N, B type	C-1	C-2	C-3	P
	TESTS C₁				--

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

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
<i>9.10.3 modify:</i>	After test:				--
	a)	C1 – 900V C2 – 900V C3 – 900V			P
	b)	C1 – 900V C2 – 900V C3 – 900V			P
	c)	C1 – 900V C2 – 900V C3 – 900V			P
	d)				N/A
	TEST SEQUENCE "C" 80A, 30mA, 3P+N, B type	C-4	C-5	C-6	P
	TESTS C₁				--
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
<i>9.10.3 modify:</i>	After test:				--
	a)	C4 – 900V C5 – 900V C6 – 900V			P
	b)	C4 – 900V C5 – 900V C6 – 900V			P
	c)	C4 – 900V C5 – 900V			P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
		C6 – 900V	
	d)		N/A
	TEST SEQUENCE "D" 80A, 30mA, 1P+N, B type	D1 D2 D3	P
	TEST D₀		P
9.9.1 <i>delete:</i>	For multiple settings of I_{Δn} tests are made for each setting		--
9.1.7 addition acc. IEC 62423	Applicable for RCCBs of type B and 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 $\alpha = 0^\circ$ 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 $\alpha = 0^\circ$ (+/-) (+/- 10 mA)		P
	No value exceeds the relevant specified limiting values		P
	TEST D ₁		P
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 <i>replace by:</i>	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		--

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	automatic opening occurs (V)		
			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 _{ΔN}: 1,25.I _{ΔN} = A		--
	Time corresponding to value for I _{ΔN} in table 1		--
	No value exceeds the specified limiting values (ms)		N/A
	Not possible to close the apparatus by manual operating means below U _x		N/A
9.17.2 <i>replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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 <i>replace by:</i>	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 (<i>replace the title by</i>)		N/A
9.1.6 <small>addition acc. IEC 62423</small>	Applicable for RCCBs of type B and F: Verification of behaviour in the case of inrush residual currents		N/A
	Test acc. figure 2		N/A
	all switches and RCCB in closed position		N/A
	pulse with a peak current of 10 I _{Δn} (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

IEC62423C - ATTACHMENT					
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 RCCBs 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
9.2.3 replace by:	Applicable for RCCBs of type B: Verification of the correct operation for three- and four-pole Type B RCDs powered on two poles only				
	Tests performed acc. to 9.2.1.2 and 9.2.1.7.1				N/A
	a) for three- and four-pole devices, RCCB only supplied between two phases chosen at random				N/A
	b) for four-pole devices, RCCB only supplied between one phase chosen at random and the neutral terminal				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				P
	starting composite residual current:				P
	Different frequency component values of test currents for calibration (RMS)		Composite starting current value (RMS)		--
	$I_{at \text{ rated}}$ frequency	I_{1kHz}	$I_{F \text{ motor (10Hz)}}$	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 – 29,8mA D2 – 29,8mA D3 – 29,9mA	P

IEC62423C - ATTACHMENT			
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		P
9.2.1.1 addition acc. IEC 62423	General		P
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 :		--
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta n}$: 800A		P
9.7.3 modify	Dielectric strength test of the main circuit at test voltage 2 U_n for 1 min:		--
	a) : D1 – 480V D2 – 480V D3 - 480V		P
	b) : D1 – 480V D2 – 480V D3 - 480V		P
	c) : D1 – 480V D2 – 480V D3 - 480V		P
	d) :		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	<1,66 $I_{\Delta n}$ =99,6	P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	produced by $I_{\Delta N}$	D-1-73,4 D-2-73,1 D-3-73,4	
	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		P
9.12.2	Mechanical impact		P
	test acc. 9.12.2.1 for all types, in addition by the tests of:		P
	- 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 <i>replace by:</i>	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 <i>replace by:</i>	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
	Tests "D2"		P
9.11.2.3c) <i>modify:</i>	Test voltage 110% of rated phase to neutral voltage for the pole exclusively for the neutral		P
9.7.3	Dielectric strength test of the main circuit at test		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	voltage of 2 Un for 1 min:		
	a)	D ₂ -1 – 480V D ₂ -2 – 480V D ₂ -3 – 480V	P
	b)	D ₂ -1 – 480V D ₂ -2 – 480V D ₂ -3 – 480V	P
	c)	D ₂ -1 – 480V D ₂ -2 – 480V D ₂ -3 – 480V	P
	d)		N/A
	No flashover or breakdown	D ₂ -1 – OK D ₂ -2 – OK D ₂ -3 – OK	P
9.2.4 modify:	Only applicable for RCCBs of type B: The RCCB under test condition of 9.2.1.7.1 b) shall trip with a smooth direct test current of 2.5 I Δ n (ms)		--
		D ₂ -1 – 27ms D ₂ -2 – 31ms D ₂ -3 - 32ms	P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	TEST SEQUENCE "D" 80A, 30mA, 3P+N, B type	D4 D5 D6	P
	TEST D0		P
9.9.1 <i>delete:</i>	For multiple settings of $I_{\Delta N}$ tests are made for each setting		--
9.1.7 addition acc. IEC 62423	Applicable for RCCBs of type B and 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 $\alpha = 0^\circ$ 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 $\alpha = 0^\circ$ (+/-) (+/- 10 mA)		N/A
	No value exceeds the relevant specified limiting values		N/A
	TEST D ₁		P
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 <i>replace by:</i>	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)		--
			N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	All values less than 0,7 U _N		N/A
	Tripping test:		N/A
	Test voltage (V).....: V		--
	Residual current 1,25.I _{ΔN}: 1,25.I _{ΔN} = A		--
	Time corresponding to value for I _{ΔN} in table 1		--
	No value exceeds the specified limiting values (ms)		N/A
	Not possible to close the apparatus by manual operating means below U _x		N/A
9.17.2 <i>replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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 <i>replace by:</i>	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 (<i>replace the title by</i>)		N/A
9.1.6 <small>addition acc. IEC 62423</small>	Applicable for RCCBs of type B and F: Verification of behaviour in the case of inrush residual currents		P
	Test acc. figure 2		P
	all switches and RCCB in closed position		P
	pulse with a peak current of 10 I _{ΔN} (mA):	300mA	P
	Pulse on one pole chosen at random	A poles	P
	Six measurements: 3 times positive, 3 times negative		P
	Polarity changed after each test		P
	No tripping during test		P

IEC62423C - ATTACHMENT					
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 RCCBs 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				P
9.2.3 <i>replace by:</i>	Applicable for RCCBs of type B: Verification of the correct operation for three- and four-pole Type B RCDs powered on two poles only				
	Tests performed acc. to 9.2.1.2 and 9.2.1.7.1				P
	a) for three- and four-pole devices, RCCB only supplied between two phases chosen at random				P
	b) for four-pole devices, RCCB only supplied between one phase chosen at random and the neutral terminal				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:				P
	Different frequency component values of test currents for calibration (RMS)		Composite starting current value (RMS)		--
	$I_{at \text{ rated}}$ frequency	I_{1kHz}	$I_{F \text{ motor (10Hz)}}$	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 – 29,9mA D5 – 29,8mA D6– 29,9mA	P

IEC62423C - ATTACHMENT			
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		P
9.2.1.1 addition acc. IEC 62423	General		P
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 :		--
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta n}$: 800A		P
9.7.3 modify	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		--
	a) : D4 – 830V D5 – 830V D6 – 830V		P
	b) : D4 – 830V D5 – 830V D6 – 830V		P
	c) : D4 – 830V D5 – 830V D6 – 830V		P
	d) :		N/A
	No flashover or breakdown : D4 – OK D5 – OK D6 – 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 $I_{\Delta n}$	<1,66 $I_{\Delta n}$ =99,6 D4 – 73,2	P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
		D5 – 73,2 D6 – 73,4	
	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		P
9.12.2	Mechanical impact		P
	test acc. 9.12.2.1 for all types, in addition by the tests of:		P
	- 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 <i>replace by:</i>	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 <i>replace by:</i>	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
	Tests "D2"		P
9.11.2.3c) <i>modify:</i>	Test voltage 110% of rated phase to neutral voltage for the pole exclusively for the neutral		P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	a)	D ₂ -4 – 830V D ₂ -5 – 830V D ₂ -6 – 830V	P
	b)	D ₂ -4 – 830V D ₂ -5 – 830V D ₂ -6 – 830V	P
	c)	D ₂ -4 – 830V D ₂ -5 – 830V D ₂ -6 – 830V	P
	d)		N/A
	No flashover or breakdown	D ₂ -4 – OK D ₂ -5 – OK D ₂ -6 – OK	P
9.2.4 modify:	Only applicable for RCCBs of type B: The RCCB under test condition of 9.2.1.7.1 b) shall trip with a smooth direct test current of 2.5 I Δ n (ms)		--
		D ₂ -4 – 19ms D ₂ -5 – 23ms D ₂ -6 - 16ms	P

	TEST SEQUENCE E (3 samples) 80A, 30mA, 1P+N, B type	E1	E2	E3	P
9.11.2.4a)	Verification of the coordination at the rated conditional short-circuit current (A): I _{nc}				P
<i>modify:</i>	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 U _n for 1 min:				P
	a)	E1 – 480V E2 – 480V E3 - 480V			P
	b)	E1 – 480V E2 – 480V E3 - 480V			P
	c)	E1 – 480V E2 – 480V			P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
		E3 - 480V	
	d)		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		--
<i>9.17.1 replace by:</i>	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 $1,25 \cdot I_{\Delta N}$	$1,25 \cdot I_{\Delta N} = A$	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)		N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
<i>9.17.2 replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	No automatically closing		N/A
9.17.4 <i>replace by:</i>	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 (<i>replace the title by</i>)		P
9.11.2.2	Verification of the rated making and breaking capacity (A): I_m	800A	P
<i>modify:</i>	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		P
	a)	E1 – 480V E2 – 480V E3 - 480V	P
	b)	E1 – 480V E2 – 480V E3 - 480V	P
	c)	E1 – 480V E2 – 480V E3 - 480V	P
	d)		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 <i>replace by:</i>	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)		--
			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)		N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 <i>replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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 <i>replace by:</i>	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 (<i>replace the title by</i>)		P

	TEST SEQUENCE E (3 samples) 80A, 30mA, 3P+N, B type	E4	E5	E6	P
9.11.2.4a)	Verification of the coordination at the rated conditional short-circuit current (A): Inc				P
<i>modify:</i>	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:				P
	a)	E4 – 830V E5 – 830V E6 - 830V			P
	b)	E4 – 830V E5 – 830V E6 - 830V			P
	c)	E4 – 830V E5 – 830V E6 - 830V			P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	d)		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		--
<i>9.17.1 replace by:</i>	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)		--
			N/A
	All values less than $0,7 U_N$		N/A
	Tripping test:		N/A
	Test voltage (V).....: V	V	--
	Residual current $1,25 \cdot I_{\Delta N}$	$1,25 \cdot I_{\Delta N} = A$	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)		N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
<i>9.17.2 replace by:</i>	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:		--
<i>a)</i>	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		N/A
<i>b)</i>	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

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
9.17.4 <i>replace by:</i>	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 (<i>replace the title by</i>)		P
9.11.2.2	Verification of the rated making and breaking capacity (A): I_m	800A	P
<i>modify:</i>	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_N$ for 1 min:		P
	a)	E4 – 830V E5 – 830V E6 - 830V	P
	b)	E4 – 830V E5 – 830V E6 - 830V	P
	c)	E4 – 830V E5 – 830V E6 - 830V	P
	d)		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 <i>replace by:</i>	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)		--
			N/A
	All values less than $0,7 U_N$		N/A
	Tripping test:		N/A
	Test voltage (V).....	V	--
	Residual current $1,25 \cdot I_{\Delta N}$	$1,25 \cdot I_{\Delta N} = A$	--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)		N/A
	Not possible to close the apparatus by manual		N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	operating means below U_x		
9.17.2 <i>replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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 <i>replace by:</i>	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 (<i>replace the title by</i>)		P

	TEST SEQUENCE F (3 samples)	F1	F2	F3	P
	80A, 30mA, 1P+N, B type				
9.11.2.4b)	Verification of the coordination at the rated making and breaking capacity (A): I_m	800A			P
<i>modify:</i>	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:				P
	a)	F1 – 480V F2 – 480V F3 - 480V			P
	b)	F1 – 480V F2 – 480V F3 - 480V			P
	c)	F1 – 480V F2 – 480V F3 - 480V			P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	d)		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		--
<i>9.17.1 replace by:</i>	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 $1,25 \cdot I_{\Delta N}$	$1,25 \cdot I_{\Delta N} = A$	--
	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
<i>9.17.2 replace by:</i>	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:		--
<i>a)</i>	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 -	N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
		F3 -	
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 <i>replace by:</i>	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 (<i>replace the title by</i>)		P
9.11.2.4c)	Verification of the coordination at the rated conditional residual short-circuit current (A): $I_{\Delta c} \dots$	10kA	P
<i>modify:</i>	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_N$ for 1 min:		P
	a)	F1 – 480V F2 – 480V F3 - 480V	P
	b)	F1 – 480V F2 – 480V F3 - 480V	P
	c)	F1 – 480V F2 – 480V F3 - 480V	P
	d)		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 <i>replace by:</i>	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 -	N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
		F3 -	
	All values less than 0,7 U _N		N/A
	Tripping test:		N/A
	Test voltage (V).....: V		--
	Residual current 1,25.I _{ΔN}: 1,25.I _{ΔN} = A		--
	Time corresponding to value for I _{ΔN} 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 <i>replace by:</i>	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 <i>replace by:</i>	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 (<i>replace the title by</i>)		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) 16A, 300mA, 1P+N, B type	F4	F4	F6	P
9.11.2.4b)	Verification of the coordination at the rated making and breaking capacity (A): I_m	500A			P
<i>modify:</i>	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:				P
	a)	F4 – 480V F5 – 480V F6 - 480V			P
	b)	F4 – 480V F5 – 480V F6 - 480V			P
	c)	F4 – 480V F5 – 480V F6 - 480V			P
	d)				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 <i>replace by:</i>	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)				--
					N/A
	All values less than $0,7 U_N$				N/A
	Tripping test:				N/A
	Test voltage (V).....	V			--
	Residual current $1,25 \cdot I_{\Delta N}$	$1,25 \cdot I_{\Delta N} = A$			--
	Time corresponding to value for $I_{\Delta N}$ in table 1				--
	No value exceeds the specified limiting values (ms)	F1 -			N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 <i>replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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 <i>replace by:</i>	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 (<i>replace the title by</i>)		P
9.11.2.4c)	Verification of the coordination at the rated conditional residual short-circuit current (A): $I_{\Delta c} \dots$	10kA	P
<i>modify:</i>	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		P
	a)	F4 – 480V F5 – 480V F6 - 480V	P
	b)	F4 – 480V F5 – 480V F6 - 480V	P
	c)	F4 – 480V F5 – 480V F6 - 480V	P
	d)		N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	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		--
<i>9.17.1 replace by:</i>	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)		--
			N/A
	All values less than $0,7 U_N$		N/A
	Tripping test:		N/A
	Test voltage (V).....: V		--
	Residual current $1,25 \cdot I_{\Delta N}$: $1,25 \cdot I_{\Delta N} = A$		--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)		N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
<i>9.17.2 replace by:</i>	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:		--
<i>a)</i>	RCCBs opening without delay		N/A
	- no value exceeds 0,5 s		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		N/A
<i>b)</i>	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
<i>9.17.4 replace by:</i>	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 (<i>replace the title by</i>)		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) 80A, 30mA, 3P+N, B type	F7	F8	F9	P
9.11.2.4b)	Verification of the coordination at the rated making and breaking capacity (A): I_m	800A			P
<i>modify:</i>	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:				P
	a)	F7 – 830V F8 – 830V F9 – 830V			P
	b)	F7 – 830V F8 – 830V F9 – 830V			P
	c)	F7 – 830V F8 – 830V F9 – 830V			P
	d)				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 <i>replace by:</i>	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)				--
					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 -			N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 <i>replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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 <i>replace by:</i>	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 (<i>replace the title by</i>)		P
9.11.2.4c)	Verification of the coordination at the rated conditional residual short-circuit current (A): $I_{\Delta c} \dots$	10kA	P
<i>modify:</i>	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		P
	a)	F7 – 830V F8 – 830V F9 - 830V	P
	b)	F7 – 830V F8 – 830V F9 - 830V	P
	c)	F7 – 830V F8 – 830V F9 - 830V	P
	d)		N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	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		--
<i>9.17.1 replace by:</i>	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)		--
			N/A
	All values less than $0,7 U_N$		N/A
	Tripping test:		N/A
	Test voltage (V).....: V		--
	Residual current $1,25 \cdot I_{\Delta N}$: $1,25 \cdot I_{\Delta N} = A$		--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)		N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
<i>9.17.2 replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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
<i>9.17.4 replace by:</i>	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 (<i>replace the title by</i>)		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) 16A, 300mA, 3P+N, B type	F10	F11	F12	P
9.11.2.4b)	Verification of the coordination at the rated making and breaking capacity (A): I_m	500A			P
<i>modify:</i>	After the tests no damage impairing further use				P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:				P
	a)	F10 – 830V F11 – 830V F12 - 830V			P
	b)	F10 – 830V F11 – 830V F12 - 830V			P
	c)	F10 – 830V F11 – 830V F12 - 830V			P
	d)				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				--
<i>9.17.1 replace by:</i>	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)				--
					N/A
	All values less than $0,7 U_N$				N/A
	Tripping test:				N/A
	Test voltage (V).....	V			--
	Residual current $1,25 \cdot I_{\Delta N}$	$1,25 \cdot I_{\Delta N} = A$			--
	Time corresponding to value for $I_{\Delta N}$ in table 1				--
	No value exceeds the specified limiting values (ms)	F1 -			N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below U_x		N/A
9.17.2 <i>replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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 <i>replace by:</i>	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 (<i>replace the title by</i>)		P
9.11.2.4c)	Verification of the coordination at the rated conditional residual short-circuit current (A): $I_{\Delta c} \dots$	10kA	P
<i>modify:</i>	After the tests no damage impairing further use		P
9.7.3	Dielectric strength test of the main circuit at test voltage of $2 U_n$ for 1 min:		P
	a)	F10 – 830V F11 – 830V F12 - 830V	P
	b)	F10 – 830V F11 – 830V F12 - 830V	P
	c)	F10 – 830V F11 – 830V F12 - 830V	P
	d)		N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	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		--
<i>9.17.1 replace by:</i>	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)		--
			N/A
	All values less than $0,7 U_N$		N/A
	Tripping test:		N/A
	Test voltage (V).....: V		--
	Residual current $1,25 \cdot I_{\Delta N}$: $1,25 \cdot I_{\Delta N} = A$		--
	Time corresponding to value for $I_{\Delta N}$ in table 1		--
	No value exceeds the specified limiting values (ms)		N/A
	Not possible to close the apparatus by manual operating means below U_x		N/A
<i>9.17.2 replace by:</i>	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		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s		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
<i>9.17.4 replace by:</i>	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 (<i>replace the title by</i>)		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

<i>modify:</i>	TEST SEQUENCE "G₀" 80A, 30mA, 1P+N, B type	G₀₁ G₀₂ G₀₃	P
9.22	VERIFICATION OF RELIABILITY		P
9.22.1	Climatic test		P

<i>modify:</i>	TEST SEQUENCE "G₀" 16A, 300mA, 1P+N, B type	G₀₄ G₀₅ G₀₆	P
9.22	VERIFICATION OF RELIABILITY		P
9.22.1	Climatic test		P

<i>modify:</i>	TEST SEQUENCE "G₀" 80A, 30mA, 3P+N, B type	G₀₇ G₀₈ G₀₉	P
9.22	VERIFICATION OF RELIABILITY		P
9.22.1	Climatic test		P

<i>modify:</i>	TEST SEQUENCE "G₀" 16A, 300mA, 3P+N, B type	G₀₁₀ G₀₁₁ G₀₁₂	P
9.22	VERIFICATION OF RELIABILITY		P
9.22.1	Climatic test		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE "G₁" 3 samples (add the new test sequence) 80A, 30mA, 3P+N, B type	G₁ G₂ G₃	P
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		--
<i>add:</i> 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
<i>add:</i> 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 _{ΔN} not exceeding the value for I _{ΔN} in table 1	G1-1 – 84ms G1-2 – 93ms G1-3 - 87ms	P
	- S-type:		--
	break time (ms) at 2,5 I _{ΔN} not exceeding the value for 2 I _{ΔN} in table 1		N/A
	Additionally for RCCBs of type A:		P
	Break time with pulsating d.c. residual currents of		P
	- 1,25 I _{ΔN} (general type)		P
	- 2,5 I _{ΔN} (S-type)		N/A
	Multiplied by:		--
	1,4 for I _{ΔN} > 0,01 A (ms)	G1-1 – 36ms G1-2 – 37ms G1-3 - 31ms	P
	2 for I _{ΔN} ≤ 0,01 A (ms)		N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	at $\alpha = 0^\circ$ el (test circuit figure 4b)		P
9.2.4 modify:	Only applicable for RCCBs of type B: The RCCB under test condition of 9.2.1.7.1 b) shall trip with a smooth direct test current of $2.5 I_{\Delta n}$ (ms)		--
		G1-1 – 27ms G1-2 – 25ms G1-3 -21ms	P
	After test possible to switch on the RCCB without presence of residual current		P
	TEST SEQUENCE "G₁" 3 samples (add the new test sequence) 16A, 300mA, 3P+N, B type	G₁₄ G₁₅ G₁₆	P
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		--
add: 8.Z1	BEHAVIOUR OF RCCBS AT LOW AMBIENT AIR TEMPERATURE		--
	RCCBs for use between -25°C and $+40^\circ\text{C}$ 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 $+40^\circ\text{C}$		--
	RCCBs mounted in enclosure with degree of protection IP 55 and connected for normal use		P
	RCCBs in a test chamber at $+23^\circ\text{C} \pm 2^\circ\text{C}$ and rH $90\% \pm 3\%$		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 – 65ms G1-5 – 69ms G1-6 - 73ms	P
	- S-type:		--
	break time (ms) at $2,5 I_{\Delta n}$ not exceeding the value for $2 I_{\Delta n}$ in table 1		N/A

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Additionally for RCCBs of type A:		P
	Break time with pulsating d.c. residual currents of		P
	- 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 – 30ms G1-5 – 36ms G1-6 - 32ms	P
	2 for $I_{\Delta N} \leq 0,01$ A (ms)		N/A
	at $\alpha = 0^\circ$ el (test circuit figure 4b)		P
9.2.4 modify:	Only applicable for RCCBs of type B: The RCCB under test condition of 9.2.1.7.1 b) shall trip with a smooth direct test current of 2.5 $I_{\Delta n}$ (ms)		--
		G1-4 – 10ms G1-5 – 13ms G1-6 - 11ms	P
	After test possible to switch on the RCCB without presence of residual current		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.5 add:	Electromagnetic Compatibility (EMC)		--
	See ATTACHMENT N°2		
	TEST SEQUENCE "H" 80A, 30mA, 3P+N, B type	H1 H2 H3	--
EN 61543:	See ATTACHMENT N°2		P
Table 4-T 1.1	Harmonics, interharmonics		--
Table 4-T 1.2	Signalling voltage		--
<i>Add:</i>			
Table 5-T 2.3	Conducted unidirectional transients of the ms and μ s time scale		--
T 2.3b	During the test RCCB no trip		P
<i>Add:</i>			
<i>Add:</i>	After the test, RCCB trip with a smooth direct test current of 2.5 I Δ n (ms) according to 9.2.4		P
	TEST SEQUENCE "I" 80A, 30mA, 3P+N, B type	I1 I2 I3	--
EN 61543:	See ATTACHMENT N°2		P
Table 5-T 2.1	Conducted sine-wave voltages or currents		--
<i>Add:</i>	During the test RCCB no trip at continuously applied smooth direct current of 0,2 I Δ n		P
<i>Add:</i>	During the test RCCB trip with a smooth direct current of 2,5 I Δ n		P
Table 5-T 2.5	Radiated high-frequency phenomena		--
<i>Add:</i>	During the test RCCB remain closed at continuously applied smooth direct current of 0,2 I Δ n		P
<i>Add:</i>	During the test RCCB trip with a smooth direct current of 2,5 I Δ n		P
Table 5-T 2.2	Fast transients (burst)		--
<i>Add:</i>	During the test RCCB no trip		P
<i>Add:</i>	After the test, RCCB trip with a smooth direct test current of 2.5 I Δ n (ms) according to 9.2.4		P

IEC62423C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	TEST SEQUENCE "J" 80A, 30mA, 3P+N, B type	J1 J2 J3	--
EN 61543:	See ATTACHMENT N°2		P
Table 5-T 2.6	Conducted common mode disturbances in the frequency range lower than 150 kHz		--
<i>Add:</i>	The RCCB remain closed at continuously applied smooth direct current of 0,2 I Δ n		P
<i>Add:</i>	The RCCB trip with a smooth direct current of 2,5 I Δ n		P
Table 6-T 3.1	Electrostatic discharges		P
<i>Add:</i>	During the test RCCB may trip		P
<i>Add:</i>	After each tripping RCCB is reclosed		P
<i>Add:</i>	After the test, RCCB trip with a smooth direct test current of 2.5 I Δ n (ms) according to 9.2.4		P

IEC62423C - ATTACHMENT

ANNEX A (NORMATIVE)

replace table A.1 by:

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

replace table A.1 by:

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 --- --- 9.9.3	No 9.1.2 9.1.3 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 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 _{Δn} 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 _{Δc}	
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.				

IEC62423C - ATTACHMENT

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	No 9.1.2 9.1.3 9.2.1.7.1	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 _{Δn} not tested in D ₁
	D ₁	9.17 9.19 --- --- --- --- 9.11.2.3 a)b) 9.16 9.12 9.18 ---	9.1.7 Type A residual current devices Behaviour in case of failure of the line voltage Behaviour in the case of 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 _{Δm} 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 _{Δc}
	---	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	9.2.1 ---	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.			

IEC62423C - ATTACHMENT

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.

IEC62423C - ATTACHMENT

<i>replace table A.3 by:</i>			
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 _{ΔN}	1 max. rating I _N min. rating I _{ΔN}	1 max. rating I _N min. rating I _{ΔN}
A ₂	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
B	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
C	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
D ₀ + D ₁	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
D ₀	1 for all other ratings of I _{ΔN}		
D ₂	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
E	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
F	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
	3 min. rating I _N max. rating I _{ΔN}	3 min. rating I _N max. rating I _{ΔN}	3 min. rating I _N max. rating I _{ΔN}
G ₀ ^{j)}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
G ₁ ^{h)}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}	3 max. rating I _N min. rating I _{ΔN}
	3 min. rating I _N max. rating I _{ΔN}	3 min. rating I _N max. rating I _{ΔN}	3 min. rating I _N max. rating I _{ΔN}
H	3 ^{h)} samples of the same rating I _N chosen at random min. rating I _{ΔN}		
I	3 ^{h)} samples of the same rating I _N chosen at random min. rating I _{ΔN}		
J	3 ^{h)} samples of the same rating I _N chosen at random min. rating I _{ΔN}		
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 _{ΔN} is submitted, min. rating I _{ΔN} and max. rating I _{ΔN} are replaced by I _{ΔN} .		
h)	Only the highest number of pole.		
i)	deleted		
j)	If the requirements to test max. rating I _N and minimum rating I _{ΔN} does not cover all the possible range of RCBOs, the minimum I _{ΔN} shall in any case be chosen for the test		

IEC62423C - ATTACHMENT

	ANNEX J Particular requirements for RCCBs with screwless type terminals for external copper conductors	N/A
	ANNEX K Particular requirements for RCCBs with flat quick-connect terminations	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	N/A

IEC62423C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

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

IEC62423C – ATTACHMENT N°1			
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 $I_{\Delta n}$) 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

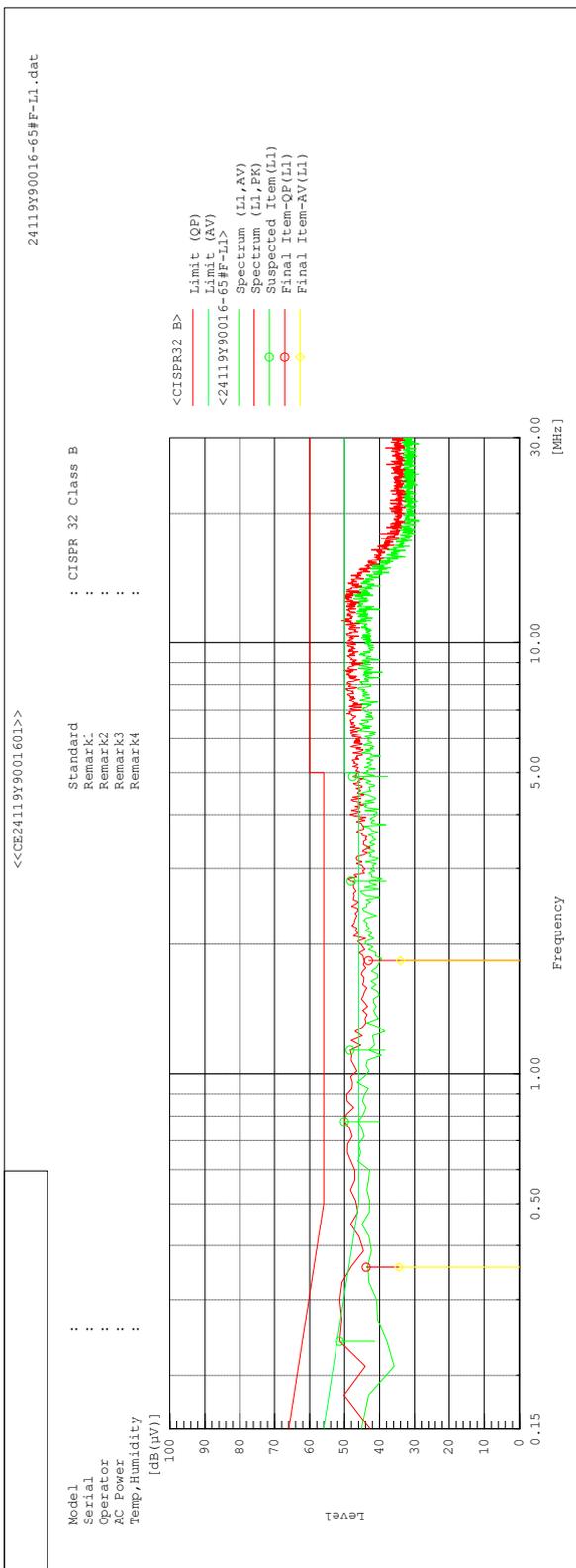
ATTACHMENT N°2

EMC test- Sequence H, I and J

IEC/EN 62423							
Clause	Requirement + Test			Result - Remark		Verdict	
	Emission test (3 samples) GYL9, In=80A IΔn =30mA 400VAC 3P+N B type			J-1	J-2	J-3	
	Conducted Emission (According to CISPR 14-1)					P	
	Disturbance voltage limits						
	Frequency range	Quasi-peak/ dBμV	Average /dBμV				
	0,15 ~ 0,5 MHz	Decreasing linearly with logarithm of frequency from 66~56	Decreasing linearly with logarithm of frequency from 56~46		P		
	0,5 ~ 5 MHz	56	46		P		
	5~30 MHz	60	50		P		
	See oscillogram CE24119Y9001601~12						
	Radiated RF disturbances (30 MHz – 1 GHz According to CISPR 14-1)					P	
	Frequency range	Quasi-peak/ dBμV	Average /dBμV				
	30 ~ 230 MHz	50	40		P		
	230~1000 MHz	57	47		P		
	See oscillogram RE24119Y9001601~003						

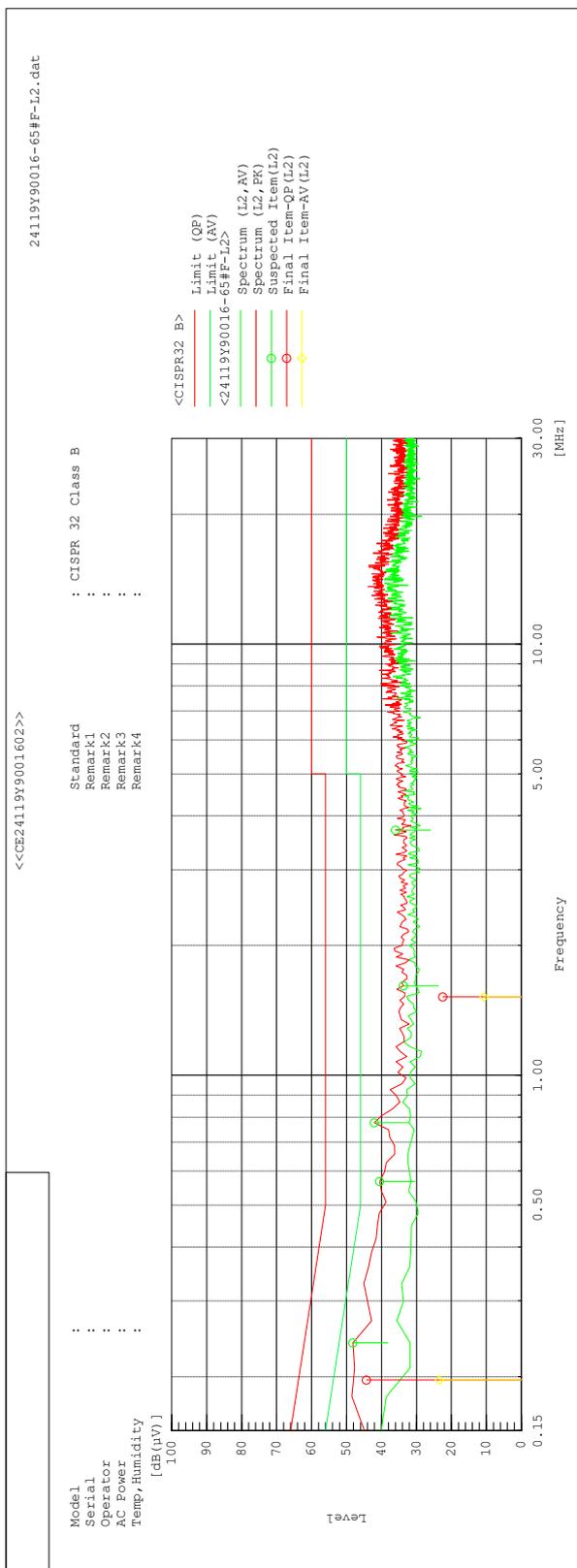
IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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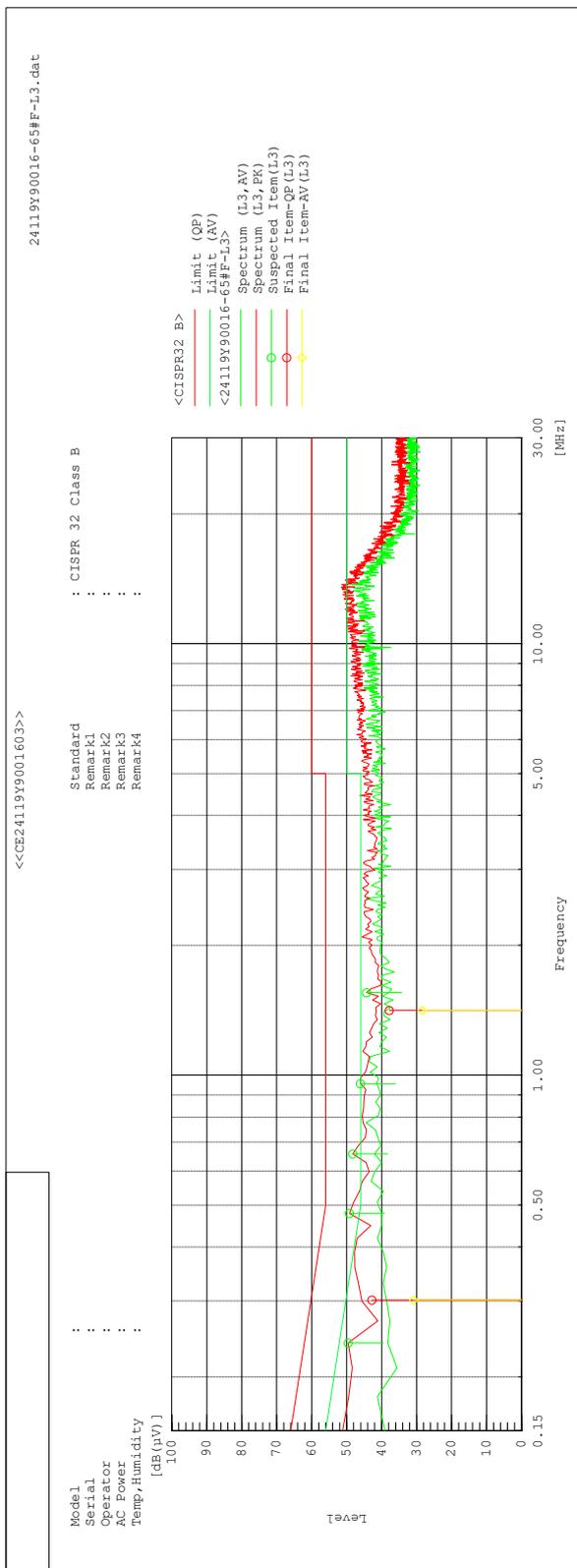


Final Result

No.	L2 Phase	Frequency [MHz]	Reading [dB(µV)]		c.f [dB]	Result [dB(µV)]		Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]	Remark
			QP	AV		QP	AV					
1	0.19657	34.0	13.1	10.3	10.3	23.4	63.8	53.8	19.5	30.4		
2	1.51862	12.0	0.3	10.4	10.7	56.0	46.0	33.6	35.3			

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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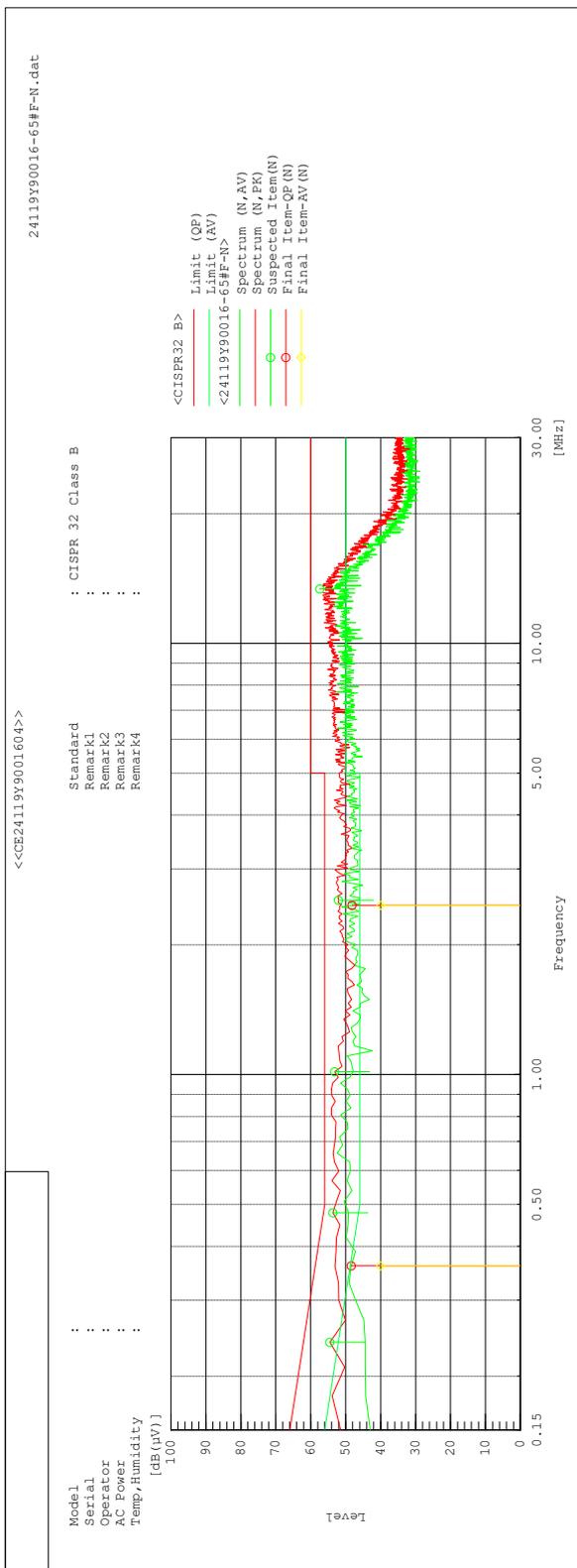
Final Result

--- I3 Phase ---

No.	Frequency [MHz]	Reading OP [dB (µV)]	Reading AV [dB (µV)]	c.f [dB]	Result OP [dB (µV)]	Result AV [dB (µV)]	Limit OP [dB (µV)]	Limit AV [dB (µV)]	Margin OP [dB]	Margin AV [dB]	Remark
1	0.3014	32.4	20.6	10.3	30.9	60.2	50.2	56.0	17.5	19.3	
2	1.41146	27.4	18.0	10.4	28.4	56.0	46.0	18.2	18.2	17.6	

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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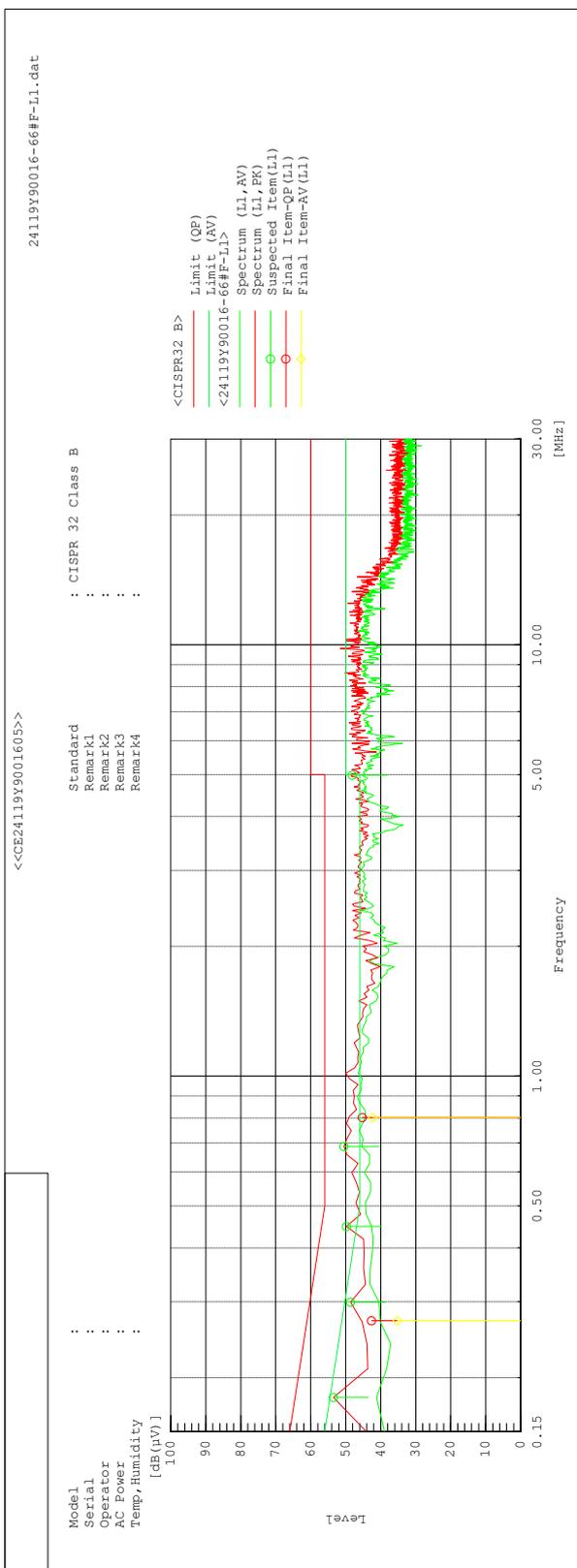


Final Result

--- N Phase ---		Reading	Reading	c.f	Result	Result	Limit	Margin	Margin	Remark
No.	Frequency [MHz]	OP [dB(µV)]	AV [dB(µV)]	[dB]	OP [dB(µV)]	AV [dB(µV)]	OP [dB(µV)]	OP [dB]	AV [dB]	
1	0.36014	38.1	29.7	10.3	48.4	40.0	58.7	10.3	8.7	
2	2.46815	37.8	29.5	10.4	48.2	39.9	46.0	7.8	6.1	

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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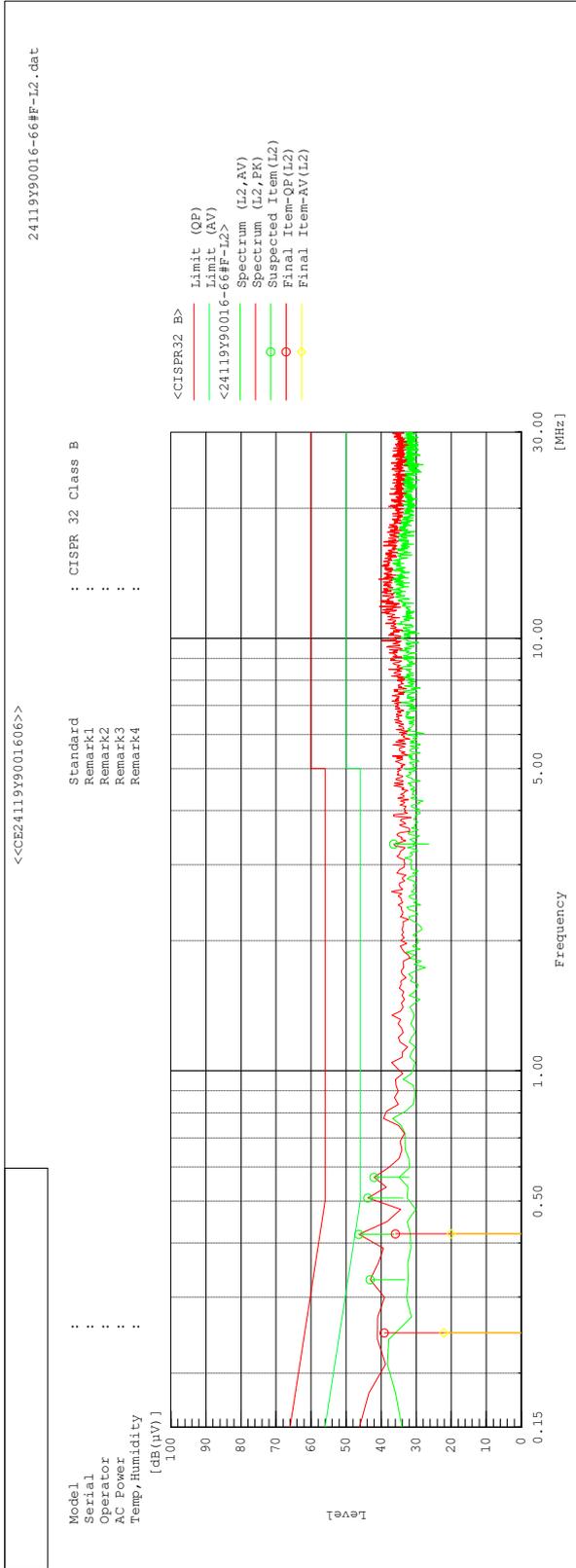


Final Result

--- LI Phase ---		Reading		c.f		Result		Limit		Margin		Remark	
No.	Frequency [MHz]	OP [dB(µV)]	AV [dB(µV)]	[dB]	[dB]	OP [dB(µV)]	AV [dB(µV)]	OP [dB(µV)]	AV [dB(µV)]	OP [dB]	AV [dB]		
1	0.27107	32.4	25.0	10.2	42.6	35.2	51.1	61.1	51.1	18.5	15.9		
2	0.80163	35.0	32.0	10.3	45.3	42.3	46.0	56.0	46.0	10.7	3.7		

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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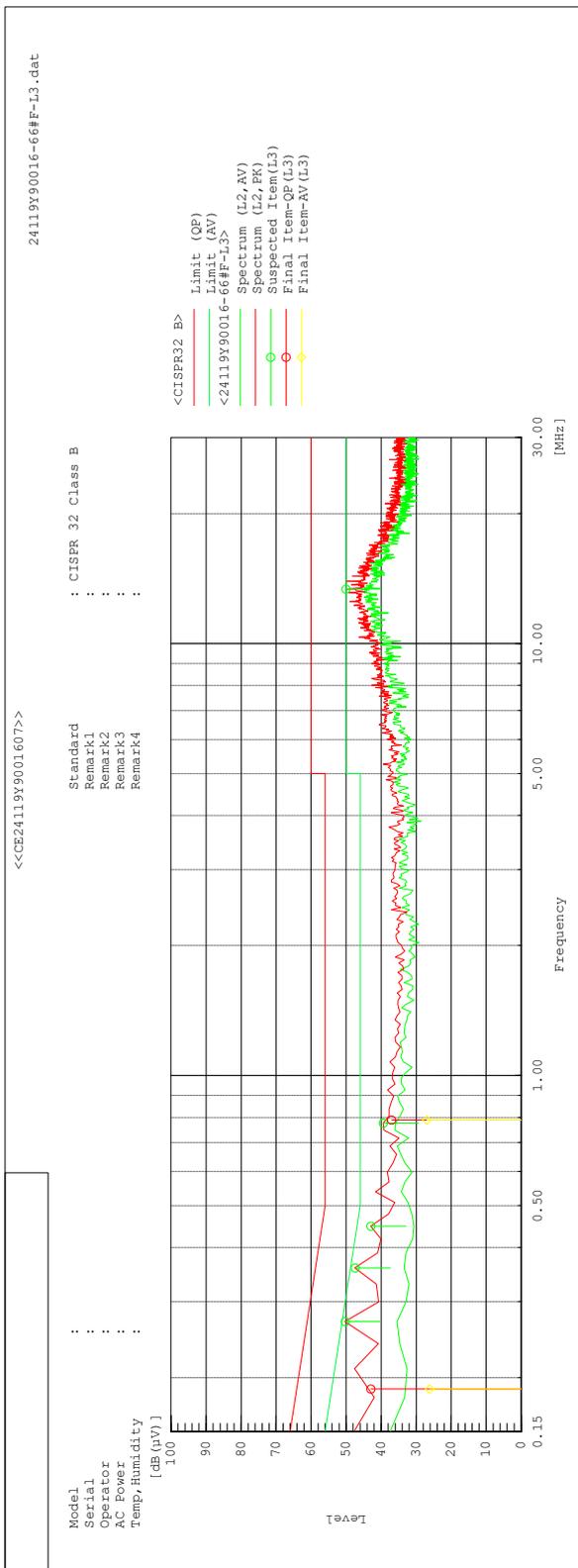
Final Result

--- L2 Phase ---

No.	Frequency [MHz]	Reading QF [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QF [dB(µV)]	Result AV [dB(µV)]	Limit QF [dB(µV)]	Limit AV [dB(µV)]	Margin QF [dB]	Margin AV [dB]	Remark
1	0.24761	28.8	11.8	10.3	39.1	22.1	61.8	51.8	22.7	29.7	
2	0.41984	25.5	9.5	10.4	35.9	19.9	57.5	47.5	21.6	27.6	

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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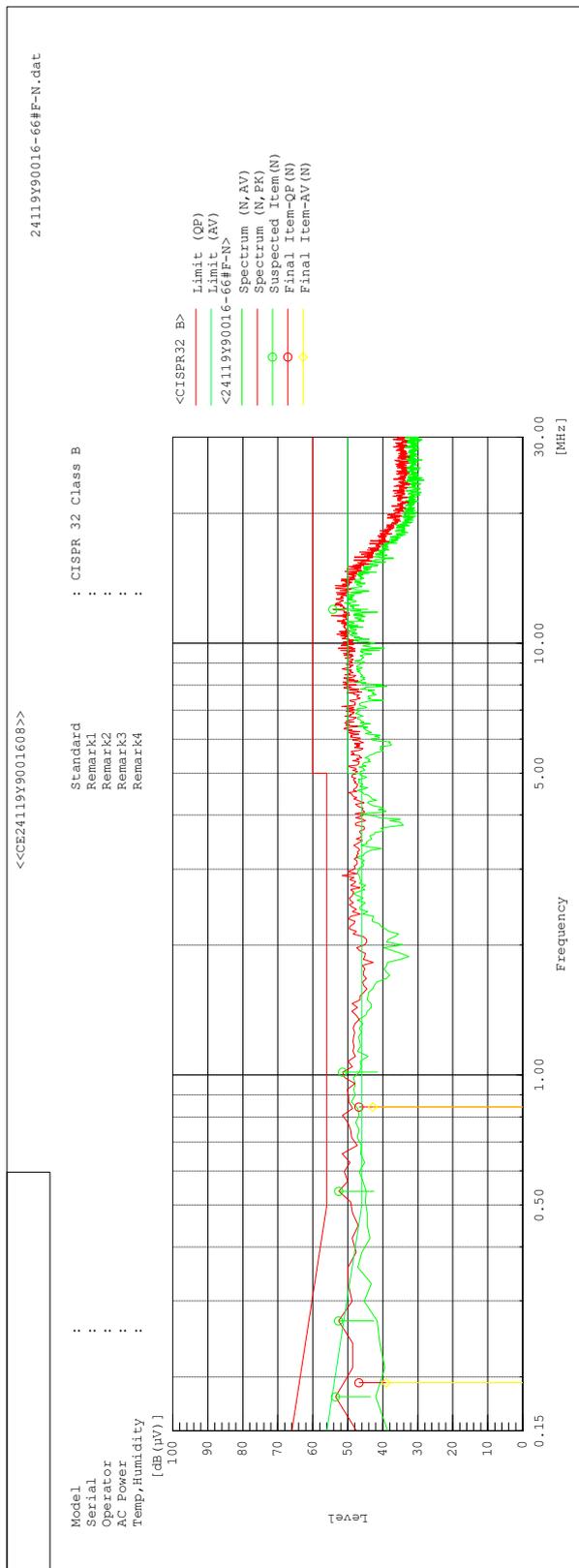
Final Result

--- L3 Phase ---

No.	Frequency [MHz]	Reading QP [dB (µV)]	Reading AV [dB (µV)]	c.f [dB]	Result QP [dB (µV)]	Result AV [dB (µV)]	Limit QP [dB (µV)]	Limit AV [dB (µV)]	Margin QP [dB]	Margin AV [dB]	Remark
1	0.18815	32.7	15.9	10.2	42.9	26.1	64.1	54.1	21.2	28.0	
2	0.78939	26.7	16.6	10.3	37.0	26.9	56.0	46.0	19.0	19.1	

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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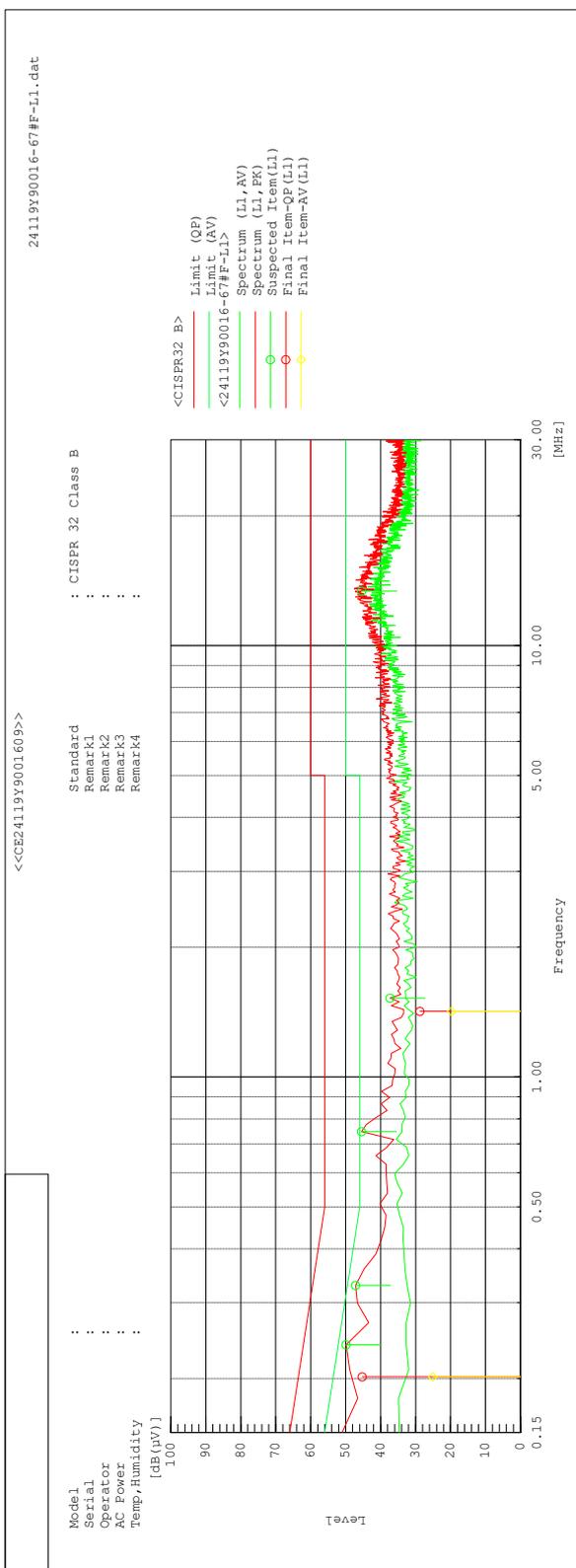


Final Result

--- N Phase ---		Reading		c.f		Result		Limit		Margin		Remark	
No.	Frequency [MHz]	OP [dB(µV)]	AV [dB(µV)]	[dB]	[dB]	OP [dB(µV)]	AV [dB(µV)]	OP [dB(µV)]	AV [dB(µV)]	OP [dB]	AV [dB]		
1	0.19388	36.6	28.8	10.2	46.8	39.0	63.9	53.9	17.1	14.9			
2	0.84297	36.5	32.5	10.3	46.8	42.8	56.0	46.0	9.2	3.2			

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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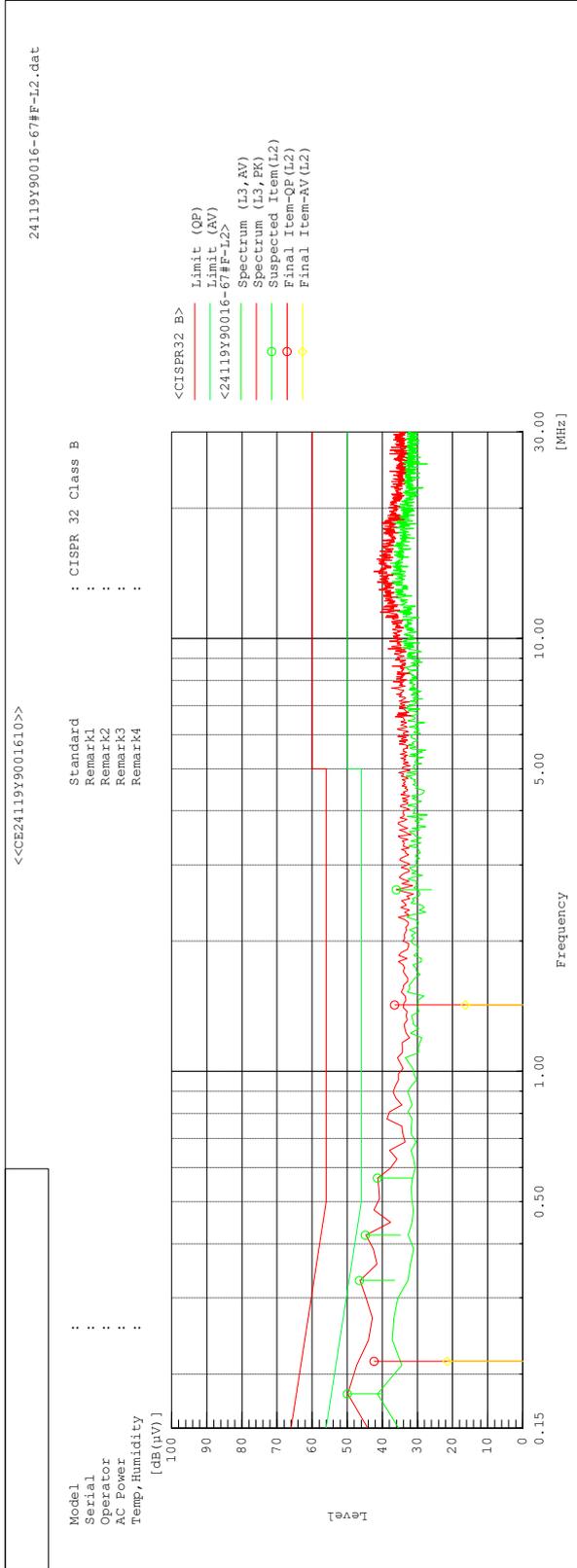
Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	0.20182	35.0	14.9	10.2	45.2	25.1	63.5	53.5	18.3	28.4
2	1.41922	18.3	9.3	10.4	28.7	19.7	56.0	46.0	27.3	26.3

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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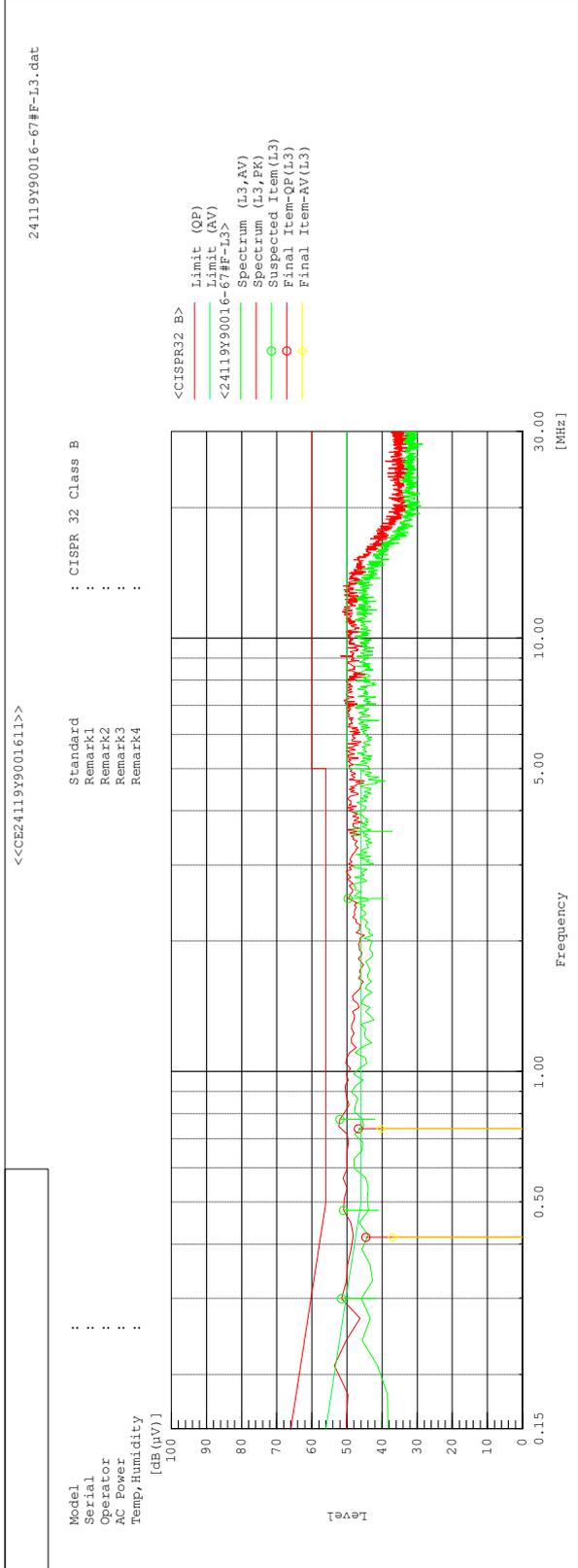
Final Result

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]	Remark
1	0.21394	32.0	11.2	10.3	42.3	21.5	63.1	53.1	20.8	31.6	
2	1.42432	26.1	5.9	10.4	36.5	16.3	56.0	46.0	19.5	29.7	

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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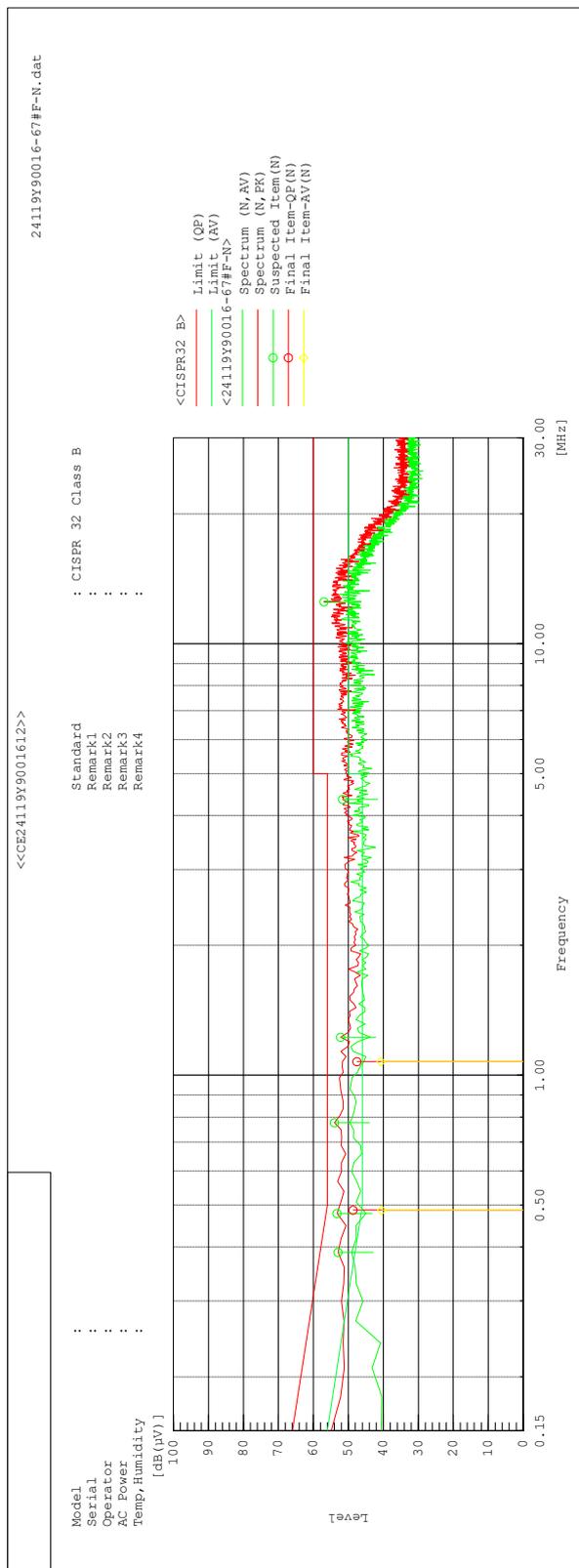


Final Result

--- I3 Phase ---		Reading		c.f		Result		Limit		Margin		Remark	
No.	Frequency [MHz]	QP [dB(µV)]	AV [dB(µV)]	[dB]	[dB]	QP [dB(µV)]	AV [dB(µV)]	QP [dB]	AV [dB]	QP [dB]	AV [dB]		
1	0.41477	34.3	26.7	10.3	10.3	44.6	37.0	57.6	47.6	13.0	10.6		
2	0.73864	36.4	30.0	10.3	10.3	46.7	40.3	56.0	46.0	9.3	5.7		

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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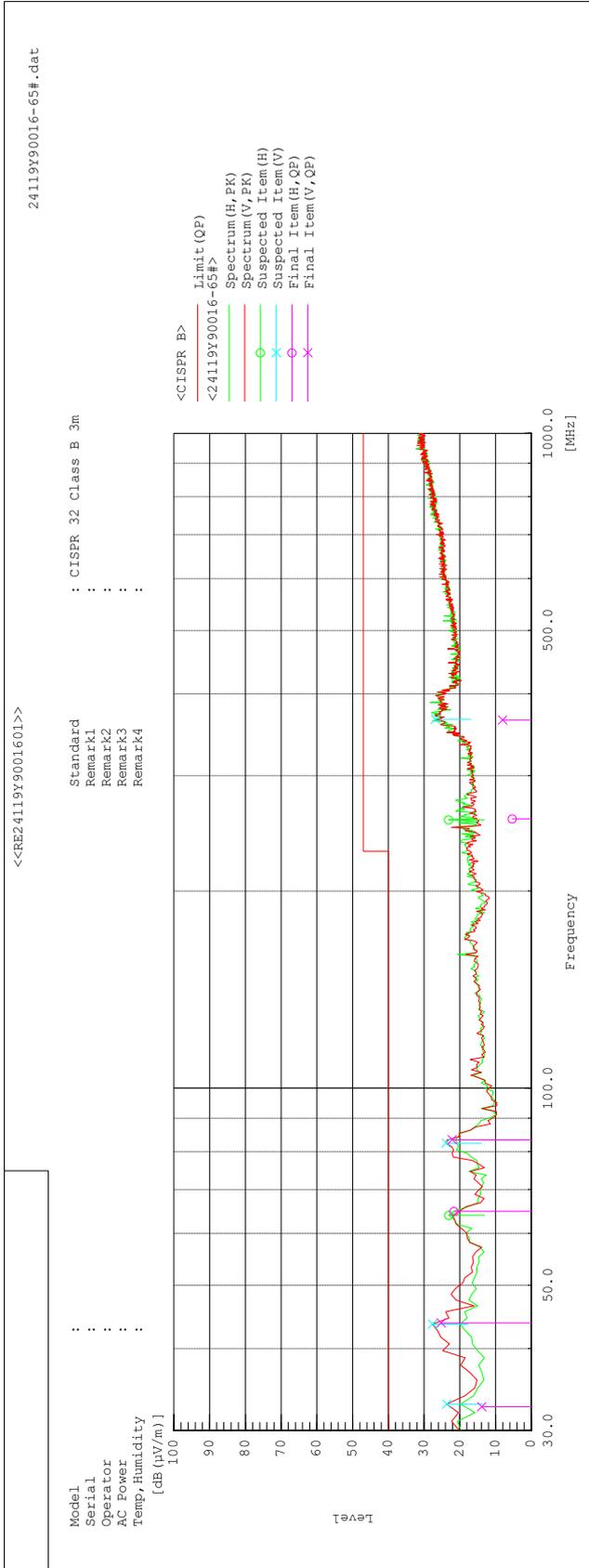
Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	0.48701	38.3	30.1	10.3	48.6	40.4	56.2	46.2	7.6	5.8
2	1.07535	37.2	30.3	10.3	47.5	40.6	56.0	46.0	8.5	5.4

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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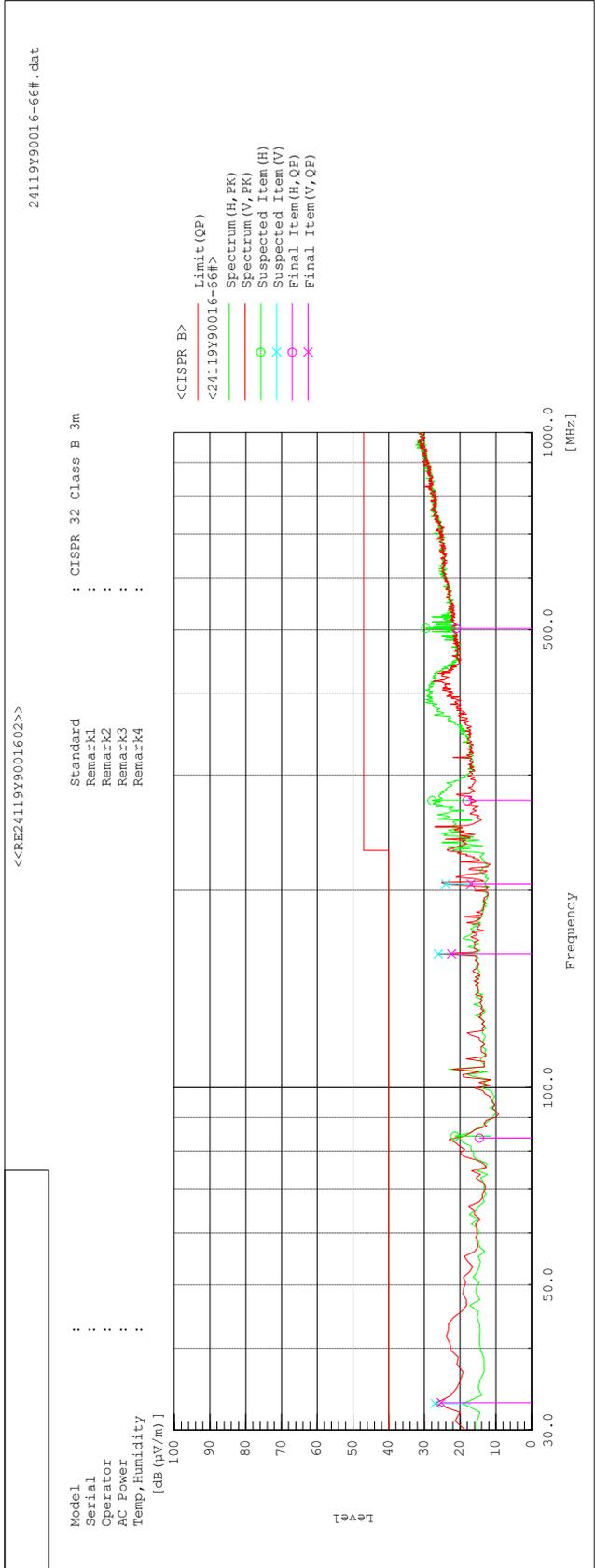


Final Result

No.	Frequency [MHz]	(P)	Reading [dB (µV)]	c.f [dB (1/m)]	Result [dB (µV/m)]	Limit [dB (µV/m)]	Height [cm]	Angle [°]	Remark
1	32.601	V	33.1	-19.2	13.9	40.0	361.0	6.4	
2	43.778	V	44.3	-19.0	25.3	40.0	145.0	5.5	
3	64.799	H	41.8	-20.2	21.6	40.0	218.0	231.2	
4	83.424	V	45.6	-23.4	22.2	40.0	258.0	3.4	
5	257.886	H	23.5	-18.2	5.3	47.0	131.0	228.8	
6	364.585	V	22.8	-14.7	8.1	47.0	112.0	244.7	

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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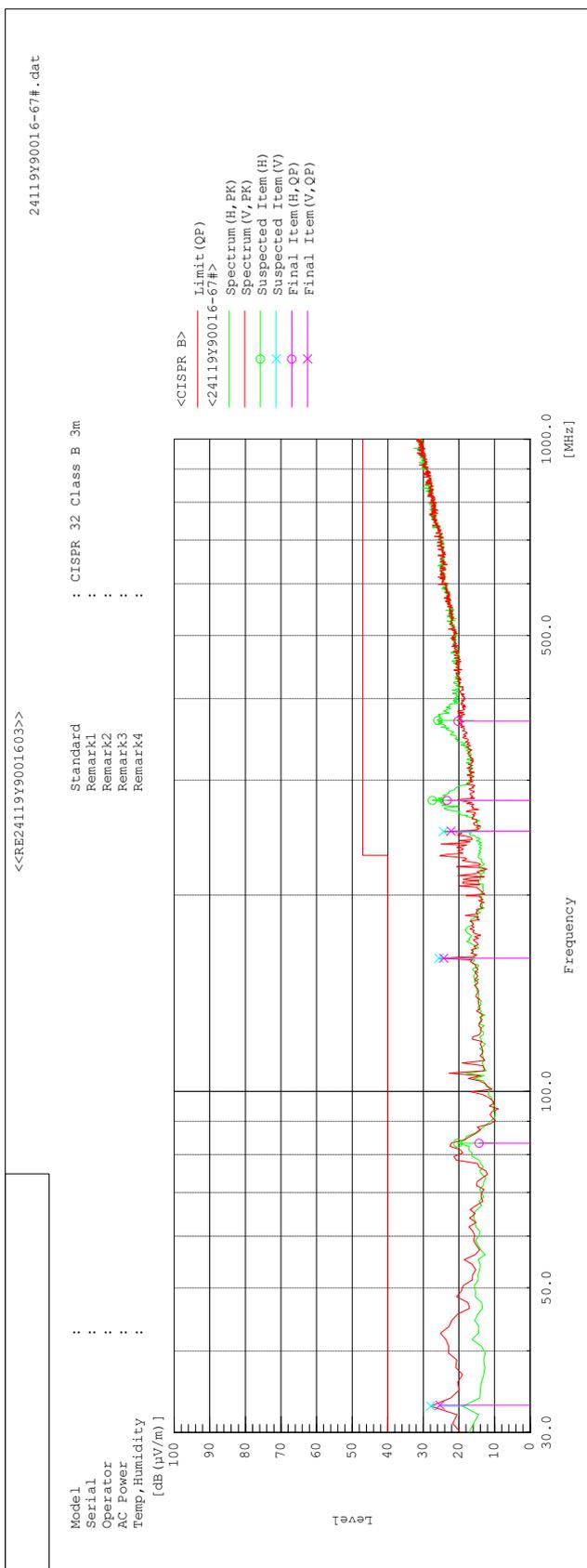


Final Result

No.	Frequency [MHz]	(P)	Reading [dB (µV)]	c.f [dB (1/m)]	Result QP [dB (µV/m)]	Limit QP [dB (µV/m)]	Height [cm]	Angle [°]	Remark
1	33.018	V	44.7	-19.4	25.3	40.0	101.0	185.9	
2	83.730	H	38.0	-23.4	14.6	40.0	101.0	83.6	
3	160.001	V	39.5	-17.0	22.5	40.0	101.0	111.7	
4	204.602	V	37.8	-20.8	17.0	40.0	101.0	66.5	
5	274.390	H	35.4	-17.4	18.0	47.0	109.0	235.5	
6	501.965	H	32.4	-11.3	21.1	47.0	105.0	259.2	

IEC/EN 62423

Clause	Requirement + Test	Result - Remark	Verdict
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Final Result

No.	Frequency [MHz]	(P)	Reading [dB (µV/m)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Height [cm]	Angle [°]	Remark
1	33.019	V	44.7	-19.4	25.3	40.0	100.0	97.2	
2	83.312	H	37.7	-23.4	14.3	40.0	101.0	61.4	
3	159.930	V	41.3	-17.0	24.3	40.0	118.0	235.5	
4	250.501	V	40.6	-18.4	22.2	47.0	102.0	19.7	
5	279.392	H	40.4	-17.1	23.3	47.0	102.0	250.0	
6	369.555	H	34.7	-14.5	20.2	47.0	101.0	194.9	

IEC/EN 62423					
Clause	Requirement + Test	Result - Remark			Verdict
	TEST SEQUENCE H (3 samples) GYL9, I _n =80A I _{Δn} =30mA 400VAC 3P+N B type	H-1	H-2	H-3	
T2.3	Surge (according to IEC 61543:1995+A1:2004+A2:2005 table 5)				P
	Test level of power port	Differential mode: L-L: 4kV L-N: 4kV Common mode L-PE: 5kV			P
	Tr/Th: 1,2/50us				P
	Pulses with both positive and negative polarity shall be applied, the preferred phase angles being 0°, 90° 180°, 270°				P
	A series of five pulses is applied for each polarity and each phase angel(total number of pulses:20), the interval between two pulses being approximately 1min.				P
	RCCB was loaded at 0,3 I _{Δn} during the test				P
	No tripping during the test	No trip			P
	After test				--
9.9.2.3a)	A residual current is sudden appear on the RCCB of I _{Δn} Required : no value exceeds the specified limiting value of (300 ms)	<u>Differential mode:</u> H-1: 71ms H-2: 73ms H-3: 71ms <u>Common mode:</u> H-1: 70ms H-2: 71ms H-3: 69ms			P
9.2.4 addition acc. IEC 62423	Only applicable for RCCBs of type B: The RCCB shall trip with a test current of I _{Δn} with smooth direct current maximum break time (300ms)	<u>Differential mode:</u> H-1: 62ms H-2: 62ms H-3: 62ms <u>Common mode:</u> H-1: 62ms H-2: 62ms H-3: 63ms			P

IEC/EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE I (3 samples) GYL9, In=80A I Δ n =30mA 400VAC 3P+N B type	I-1	I-2	I-3	P
T2.1	Conducted sine-wave form voltages or currents (according to IEC 61543:1995+A1:2004+A2:2005 table 5)				P
	Test level of power port	10V			P
	For step 1, the frequency shall be swept over the ranges of 150kHz to 80MHz				P
	The dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the previous frequency.				P
	RCCB was loaded at 0,3 I Δ n with AC of L pole during the test	9mA			P
	RCCB was loaded at 0,2 I Δ n with smooth direct current of N pole during the test	6mA			P
	No tripping during the test	No trip			P
	Step 2 tripping tests, with 1,25 I Δ n at rated frequency, are carried out on each sample at 5 different frequency values selected at random over the frequency range and different from one sample to another. The device shall trip. maximum break time (300ms)	1,25 I Δ n=37,5mA Tripp time \leq 300ms			P
		Sample: I-1			--
	0,150 MHz	64ms			P
	0,450MHz	68ms			P
	0,900MHz	67ms			P
	1,80MHz	70ms			P
	2,40MHz	71ms			P
		Sample: I-2			--
	3,60MHz	71ms			P
	4,80MHz	70ms			P
	7,20MHz	68ms			P
	9,60MHz	64ms			P
	12,0MHz	68ms			P

IEC/EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
		Sample : I-3	--
	19,2MHz	70ms	P
	27,0MHz	67ms	P
	49,4MHz	67ms	P
	72,0MHz	69ms	P
	80,0MHz	71ms	P
	Step 2 tripping tests, with 2 $I_{\Delta n}$ smooth direct current at rated frequency, are carried out on each sample at 5 different frequency values selected at random over the frequency range and different from one sample to another. The device shall trip. maximum break time (300ms)	2 $I_{\Delta n}$ with smooth direct curre=60,0mA Tripp time \leq 300ms	P
		Sample : I-1	--
	0,150 MHz	60ms	P
	0,450MHz	61ms	P
	0,900MHz	61ms	P
	1,80MHz	60ms	P
	2,40MHz	60ms	P
		Sample : I-2	--
	3,60MHz	60ms	P
	4,80MHz	61ms	P
	7,20MHz	60ms	P
	9,60MHz	60ms	P
	12,0MHz	61ms	P
		Sample : I-3	--
	19,2MHz	62ms	P
	27,0MHz	60ms	P
	49,4MHz	60ms	P
	72,0MHz	60ms	P
	80,0MHz	60ms	P

IEC/EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

T2.5	Radiated electromagnetic field (according to IEC 61543:1995+A1:2004+A2:2005 table 5)		P	
	Test level:	10V/m	P	
	For step 1, the frequency shall be swept over the ranges of 80MHz to 1GHz.		P	
	The dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.	Actual dwell time:1s	P	
	RCCB was loaded at 0,3 $I_{\Delta n}$ with AC of L pole during the test	9mA	P	
	RCCB was loaded at 0,2 $I_{\Delta n}$ with smooth direct current of N pole during the test	6mA	P	
	No tripping during the test	No trip	P	
	For step 2, tripping tests, with 1,25 $I_{\Delta n}$ carried out at 450 MHz and at 900 MHz and at 3 other frequencies selected at random within the specified range and different from one sample to another	1,25 $I_{\Delta n}$ =37,5mA Tripp time \leq 300ms	P	
		Sample : I-1	--	
		Direction of polarization	--	
		horizontal	vertical	
	80 MHz	68ms	69ms	P
	100 MHz	69ms	70ms	P
	120 MHz	70ms	71ms	P
	450 MHz	71ms	72ms	P
	900 MHz	70ms	70ms	P
		Sample : I-2	--	
	180 MHz	68ms	69ms	P
	240 MHz	71ms	68ms	P
	320 MHz	70ms	69ms	P
	450 MHz	71ms	70ms	P
	900 MHz	72ms	71ms	P
		Sample : I-3	--	
	450 MHz	68ms	70ms	P
	520 MHz	69ms	70ms	P
	640 MHz	70ms	72ms	P

IEC/EN 62423				
Clause	Requirement + Test	Result - Remark		Verdict
	900 MHz	71ms	70ms	P
	1000MHz	72ms	71ms	P
	For step 2, tripping tests, with 2 I _{Δn} smooth direct current carried out at 450 MHz and at 900 MHz and at 3 other frequencies selected at random within the specified range and different from one sample to another	2I _{Δn} =60mA Tripp time ≤ 300ms		P
		Sample : I-1		--
		Direction of polarization		--
		horizontal	vertical	
	80 MHz	61ms	60ms	P
	100 MHz	60ms	60ms	P
	120 MHz	60ms	60ms	P
	450 MHz	60ms	59ms	P
	900 MHz	60ms	60ms	P
		Sample : I-2		--
	180 MHz	59ms	60ms	P
	240 MHz	60ms	60ms	P
	320 MHz	60ms	60ms	P
	450 MHz	60ms	61ms	P
	900 MHz	60ms	60ms	P
		Sample : I-3		--
	450 MHz	60ms	60ms	P
	520 MHz	61ms	60ms	P
	640 MHz	61ms	60ms	P
	900 MHz	60ms	60ms	P
	1000MHz	61ms	60ms	P
T2.2	Electrical fast transients/bursts (EFT/B) (according to IEC 61543:1995+A1:2004+A2:2005 table 5)			P
	Test level of power port	4kV		P
	Tr/Th: 5/50ns			P
	Repetition frequency: 2,5kHz			P
	Test duration	1min		P
	No tripping during the test	No trip		P

IEC/EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3a)	A residual current is sudden appear on the RCCB of $I_{\Delta n}$ Required : no value exceeds the specified limiting value of (300 ms)	I-1: 71ms I-2: 72ms I-3: 71ms	P
9.2.4 addition acc. IEC 62423	Only applicable for RCCBs of type B: The RCCB shall trip with a test current of $I_{\Delta n}$ with smooth direct current maximum break time (300ms)	I-1: 62ms I-2: 62ms I-3: 62ms	P

IEC/EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE J (3 samples) GYL9, In=80A I Δ n =30mA 400VAC 3P+N B type		J-1	J-2	J-3	
T2.6	Conducted common mode disturbances in the frequency range lower than 150 kHz (according to IEC 61543:1995+A1:2004+A2:2005 table 5)					P
	Current levels :		Level 3			P
	Frequency range: 1 kHz to 1,5 kHz		test current : 6,6 mA			P
	Frequency range: 1,5 kHz to 15 kHz		test current : 6,6 to 66 mA			P
	Frequency range: 15 kHz to 150 kHz		test current : 66mA			P
	For step 1, the frequency shall be swept over the ranges of 1kHz to 150kHz					P
	RCCB was loaded at 0,3 I Δ n with AC of L pole during the test		9mA			P
	RCCB was loaded at 0,2 I Δ n with smooth direct current of N pole during the test		6mA			P
	No tripping during the test		No trip			P
	Step 2 tripping tests, with 1,25 I Δ n at rated frequency, are carried out on each sample at 5 different frequency values selected at random over the frequency range and different from one sample to another. The device shall trip. maximum break time (300ms)		1,25 I Δ n=37,5mA Tripp time \leq 300ms			P
	Frequency	Test current	Sample J-1		--	
	1,0kHz	6,6mA	70ms		P	
	1,1kHz	6,6mA	71ms		P	
	1,2kHz	6,6mA	74ms		P	
	1,3kHz	6,6mA	68ms		P	
	1,4kHz	6,6mA	69ms		P	
			Sample J-2		--	
	1,5kHz	6,6mA	71ms		P	
	3,0kHz	13,2mA	70ms		P	
	4,5kHz	19,8mA	67ms		P	
	9,0kHz	39,6mA	67ms		P	
	12kHz	52,8mA	69ms		P	

IEC/EN 62423				
Clause	Requirement + Test		Result - Remark	Verdict
			Sample J-3	--
	15kHz	66,0mA	70ms	P
	60kHz	66,0mA	68ms	P
	90kHz	66,0mA	71ms	P
	120kHz	66,0mA	70ms	P
	150kHz	66,0mA	71ms	P
	Step 2 tripping tests, with 2 $I_{\Delta n}$ smooth direct current at rated frequency, are carried out on each sample at 5 different frequency values selected at random over the frequency range and different from one sample to another. The device shall trip. maximum break time (300ms)		2 $I_{\Delta n}$ =60mA Tripp time \leq 300ms	P
			Sample J-1	--
	1,0kHz	6,6mA	60ms	P
	1,1kHz	6,6mA	59ms	P
	1,2kHz	6,6mA	59ms	P
	1,3kHz	6,6mA	60ms	P
	1,4kHz	6,6mA	60ms	P
			Sample J-2	--
	1,5kHz	6,6mA	60ms	P
	3,0kHz	13,2mA	60ms	P
	4,5kHz	19,8mA	60ms	P
	9,0kHz	39,6mA	61ms	P
	12kHz	52,8mA	60ms	P
			Sample J-3	--
	15kHz	66,0mA	60ms	P
	60kHz	66,0mA	60ms	P
	90kHz	66,0mA	61ms	P
	120kHz	66,0mA	61ms	P
	150kHz	66,0mA	60ms	P

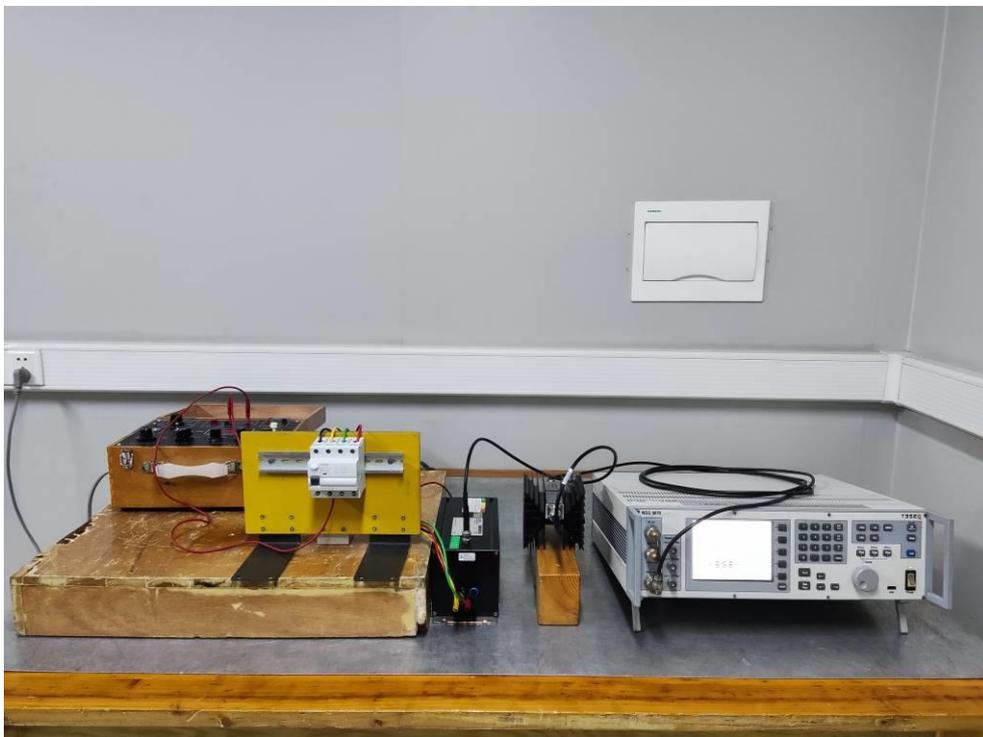
IEC/EN 62423			
Clause	Requirement + Test	Result - Remark	Verdict

T3.1	Electrostatic discharges (according to IEC 61543:1995+A1:2004+A2:2005 table 6)		P
	Discharge test voltage	8 kV / air discharge 6 kV / contact discharge 6 kV /indirect discharge	P
	Polarity of discharges	positive/negative	P
	10 positive and 10 negative with interval time of 1s		P
9.9.2.3a)	A residual current is sudden appear on the RCCB of $I_{\Delta n}$ Required : no value exceeds the specified limiting value of (300 ms)	J-1: 72ms J-2: 71ms J-3: 71ms	P
9.2.4 addition acc. IEC 62423	Only applicable for RCCBs of type B: The RCCB shall trip with a test current of $I_{\Delta n}$ with smooth direct current maximum break time (300ms)	J-1: 62ms J-2: 62ms J-3: 62ms	P

EMC TEST PHOTO



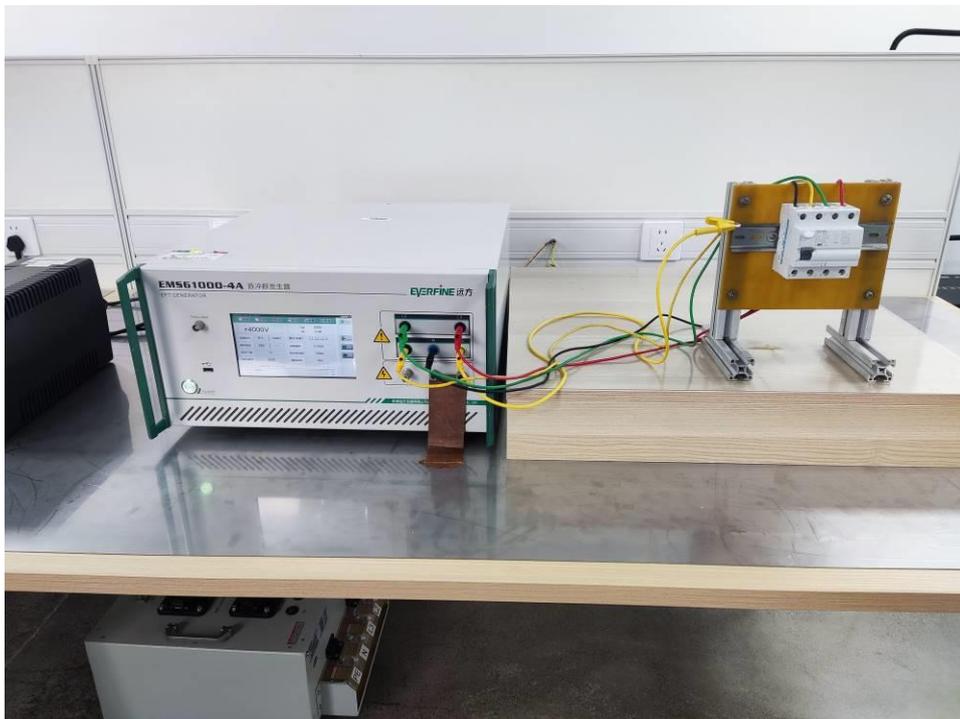
Surge



Conducted sine-wave form voltages or currents



Radiated electromagnetic field



Fast transients (bursts)



Conducted common mode disturbances in the frequency range lower than 150 kHz



Electrostatic discharges

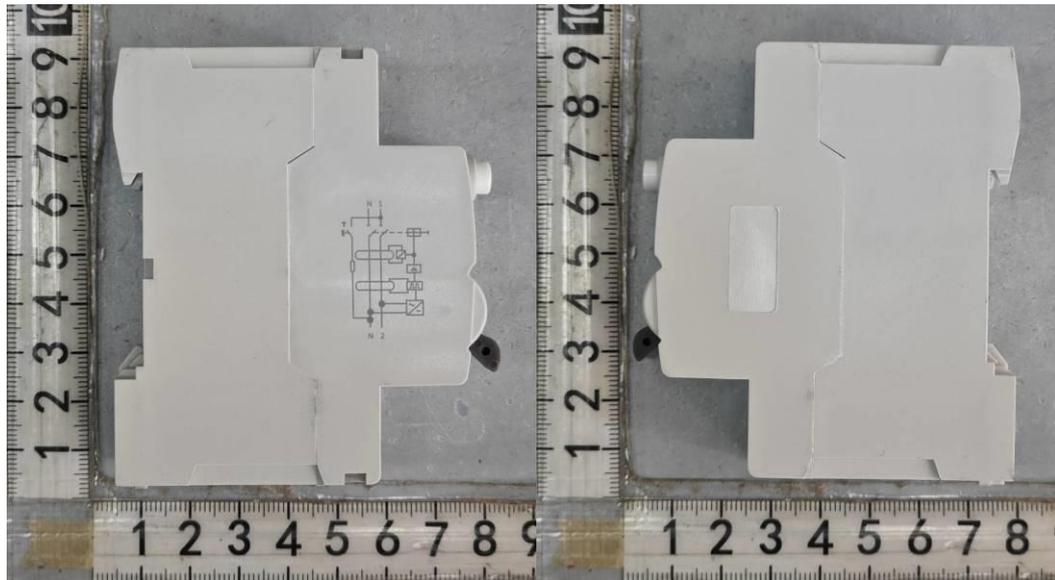


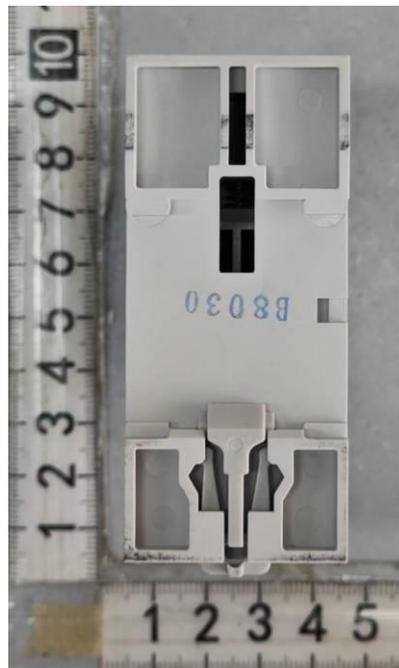
Radiated Emission

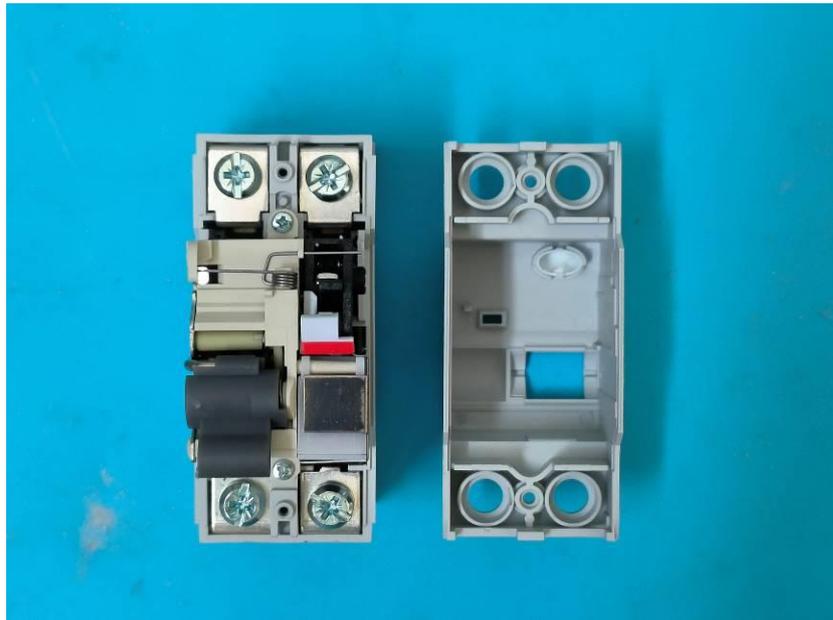


Conducted Emission

Photography
80A/30mA/1P+N







80A/30mA/3P+N

