Test Report issued under the responsibility of:

TEST REPORT
IEC 60898-1
Circuit-breakers for over current protection for household and similar installations
Part 1 - Circuit-breakers for a.c. operation

Report Number. ..... :	B230143
Date of issue ..... :	2024-04-17
Total number of pages ..... :	131 pages
Name of Testing Laboratory preparing the Report ..... :	**Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)**
Applicant's name ..... :	Zhejiang Changcheng Trading Co.,Ltd.
Address ..... :	DianHou Village, Liushi Town Yueqing City 325603 Zhejiang P.R. China
Test specification:	
Standard ..... :	IEC 60898-1:2015, AMD1:2019
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60898_1E
Test Report Form(s) Originator .... :	DEKRA Certification B.V.
Master TRF ..... :	Dated 2020-04-17

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

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	MCB
Trade Mark(s) ..... :	CNC
Manufacturer ..... :	CNC Electric Group Zhejiang Technology Co.,Ltd. DianHou Village, Liushi Town Yueqing City 325603 Zhejiang P.R. China
Model/Type reference ..... :	YCB7-63N
Ratings ..... :	See pages 9 to 10

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)	
Testing location/ address ..... :		Inspection and Quarantine Mansion, jingang Avenue, Liushi, Yueqing, Wenzhou, Zhejiang, P.R.China	
Tested by (name, function, signature) ..... :		Gaoke Zheng - Testing engineer Lechen HU - Testing engineer (Reviewer)	Gaoke Zheng Lechen Hu
Approved by (name, function, signature)... :		Xiaomu Ye - Technical manager	Xiaomu Ye
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address ..... :			
Tested by (name, function, signature) ..... :			
Approved by (name, function, signature)... :			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address ..... :			
Tested by (name + signature) ..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature)... :			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address ..... :			
Tested by (name, function, signature) ..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature)... :			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment):
Attachment for European group differences See Annex No.1. (Total pages 13)

Summary of testing:

Standard used:

-IEC 60898-1:2015+AMD1:2019

-EN 60898-1:2019

-The products with Icn=Ics=6kA are identical to ones with Icn=Ics=4,5kA and Icn=Ics=3kA except for marking different ratings of the short-circuit breaking capacity.

-All the samples satisfy to the clauses examined.

Tests performed (name of test and test clause):

Model		Test sequences									
In		A_1	A_2	B	C_1	C_2	D_0+D_1	D_0	E_1	E_2	E_3
1P Type C Icn=6kA	63A	1	3	3	3	3	3	-	3+3	-	-
	50A	-	-	-	-	-	-	1	-	-	-
	40A	-	-	-	-	-	-	1	-	-	-
	32A	-	-	-	-	-	-	1	-	-	-
	25A	-	-	-	-	-	-	1	-	-	-
	20A	-	-	-	-	-	-	1	-	-	-
	16A	-	-	-	-	-	-	1	-	-	-
	10A	-	-	-	-	-	-	1	-	-	-
	6A	-	-	-	-	-	-	1	-	-	-
	4A	-	-	-	-	-	-	1	-	-	-
	2A	-	-	-	-	-	-	1	3+3	-	-
2P Type C Icn=6kA	63A	-	3	-	-	2	-	-	3	-	-
	2A	-	-	-	-	-	-	-	3	-	-
4P Type C Icn=6kA	63A	1	3	3	3	1	3+4	-	3	-	-
	2A	-	-	-	-	-	-	-	3	-	-

Model		Test sequences									
In		A_1	A_2	B	C_1	C_2	D_0+D_1	D_0	E_1	E_2	E_3
1P Type B Icn=6kA	63A	-	-	3**	-	-	-	1*	-	-	-
	50A	-	-	-	-	-	-	1*	-	-	-
	40A	-	-	-	-	-	-	1*	-	-	-
	32A	-	-	-	-	-	-	1*	-	-	-
	25A	-	-	-	-	-	-	1*	-	-	-

	20A	-	-	-	-	-	-	1*	-	-	-
	16A	-	-	-	-	-	-	1*	-	-	-
	10A	-	-	-	-	-	-	1*	-	-	-
	6A	-	-	-	-	-	-	1*	-	-	-
	4A	-	-	-	-	-	-	1*	-	-	-
	2A	-	-	-	-	-	-	1*	-	-	-
4P Type B Icn=6kA	63A	-	-	3**	-	-	-	-	-	-	-

*only clause 9.10.3
**only clause 9.8

Model		**Test sequences**									
In		A_1	A_2	B	C_1	C_2	D_0+D_1	D_0	E_1	E_2	E_3
1P Type C Icn=4.5kA	63A	-	-	-	-	-	-	-	3+3	-	-
	2A	-	-	-	-	-	-	-	3+3	-	-
2P Type C Icn=4.5kA	63A	-	-	-	-	-	-	-	3	-	-
	2A	-	-	-	-	-	-	-	3	-	-
4P Type C Icn=4.5kA	63A	-	-	-	-	-	-	-	3	-	-
	2A	-	-	-	-	-	-	-	3	-	-

Model		**Test sequences**									
In		A_1	A_2	B	C_1	C_2	D_0+D_1	D_0	E_1	E_2	E_3
1P Type C Icn=3kA	63A	-	-	-	-	-	-	-	3+3	-	-
	2A	-	-	-	-	-	-	-	3+3	-	-
2P Type C Icn=3kA	63A	-	-	-	-	-	-	-	3	-	-
	2A	-	-	-	-	-	-	-	3	-	-
4P Type C Icn=3kA	63A	-	-	-	-	-	-	-	3	-	-
	2A	-	-	-	-	-	-	-	3	-	-

Testing location:

Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)

Inspection and Quarantine Mansion, jingang Avenue, Liushi, Yueqing, Wenzhou, Zhejiang, P.R.China

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

CENELEC

☒ **The product fulfils the requirements of EN 60898-1:2019**

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

☒ **Statement not required by the standard used for type testing**

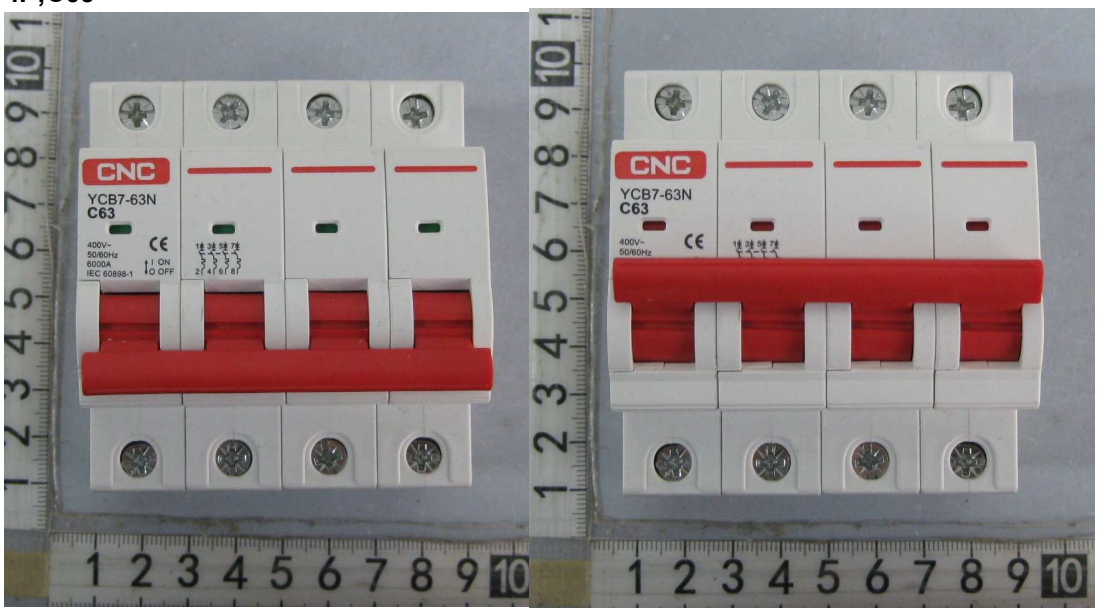
(Note: When IEC or ISO standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)

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;C63

4P;C63



Test item particulars .....:	MCB
Classification of installation and use .....:	On rail
Supply Connection.....:	Pillar terminals for copper conductors
.....:	
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 .....:	2023-11-28
Date (s) of performance of tests.....:	2023-11-29 to 2024-04-11

General remarks:

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

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

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

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

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

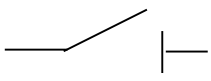
Name and address of factory (ies).....:	CNC Electric Group Zhejiang Technology Co.,Ltd. DianHou Village, Liushi Town Yueqing City 325603 Zhejiang P.R. China

General product information and other remarks:

Type C and B
Ue=230/400V,240/415V~(1P);400V,415V~(2P;3P;4P)
In=2;4;6;10;16;20;25;32;40;50;63A
Icn=Ics=6000A,4500A and 3000A
Energy limit class: 1 (according to EN 60898-1)
Grid distance: 45mm
Ui=500V
Uimp=4kV
Screw diameter of load terminal =4,8mm

Test item particulars ..... :	MCB
Type of circuit-breaker ..... :	YCB7-63N
Number of poles ..... :	☒ 1-P ☐ 1-P+N ☒ 2-P ☒ 3-P ☐ 3-P+N ☒ 4-P
Protection against external influences ..... :	☒ enclosed ☐ unenclosed
Method of mounting ..... :	☐ surface ☐ flush ☐ panel board ☒ on rail
Method of connection ..... :	☒.not associated with the mechanical mounting ☐ associated with the mechanical mounting
Type of terminal ..... :	☐ screw a) b) ☒ pillar a) b) ☐ cage a) b) ☐ lug ☐ screw less a) ☐ flat quick connect a) ☐ plug-in ☐ screw-in a) copper conductors b) ~~aluminium conductors~~
Instantaneous tripping current ..... :	☒ B ☒ C ☐ D
I^2t characteristic .....:	Class 1 (according to EN 60898-1)
Value of rated operational voltage (Ue)..... :	☐ 120 V ☐ 230 V ☐ 240 V ☐ 120/240 V ☒ 230/400 V for 1P ☒ 400 V for 2P/3P/4P ☒ 240/415 V for 1P ☒ 415 V for 2P/3P/4P
Value of rated current (In)..... :	2;4;6;10;16;20;25;32;40;50;63A
Value of rated frequency ..... :	☒ 50 Hz ☒ 60 Hz
Ambient air temperature (°C) ..... :	☒ 30°C ☐ 40°C ☐ Other _____°C
Rated short-circuit capacity (Icn) ..... :	☐ 1,5 kA ☒ 3 kA ☒ 4,5 kA ☒ 6 kA ☐ 10 kA ☐ 15 kA ☐ 20 kA ☐ 25 kA
Rated impulse withstand voltage (Uimp)	☐ 2,5 kV ☒ 4 kV ☐ declared ___kV

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „A_1“ 1 SAMPLE 1P;C63 4P;C63	**A_{1-1}**	**A_{1-2}**	--
6	**MARKING AND OTHER INFORMATION**			
	Circuit-breaker marked with:			--
	a) Manufacturer’s name or trade mark..... :			P
	b) Type designation, catalogue number or other serial number..... :	YCB7-63N		P
	c) Rated voltage (V) ..... :	240/415V~	415V~	P
	d) Rated current without symbol "A", preceded by the symbol of instantaneous tripping..... :	C63		P
	e) Rated frequency (Hz) ..... :	50/60Hz		P
	f) Rated short circuit capacity (A) ..... :	6000 with a rectangle		P
	g) Wiring diagram			P
	h) Ambient air temperature, if different from 30°C			N/A
	i) Degree of protection, if different from IP20			N/A
	j) For D-type circuit-breakers: the maximum instantaneous tripping current, if higher than 20 In see table 2)			N/A
	k) Rated impulse withstand voltage Uimp if it is 2,5 kV			N/A
	l) Making and breaking capacity on an individual protected pole of multipole circuit-breakers (Icn1), if different from Icn			N/A
	Marking d) shall be readily visible when the CB is installed			P
	If, for small devices, the available space is insufficient, markings a), b), c), e), f), h), j) and l) may be put on the side or on the back of the CB			P
	Marking g) may be on the inside of any cover which has to be removed in order to connect the supply wires but shall not be on a label loosely attached to the CB			P
	Any other information not marked shall be given in the manufacturer’s documentation			P
	The suitability for isolation, which is provided by all circuit-breakers of this standard, may be indicated by the symbol on the device			P
	I^2t characteristic (documentation)			N/A
	Symbols on supply and load terminal			N/A

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal for neutral conductor N		N/A
	Earthing terminal if any (IEC 60417-5019)		N/A
	On - off position shall be clearly indicated - 0 I -	I O	P
	For push-button CB the off push-button shall either be red or be marked with the symbol ´0´		N/A
	Red not used for other push-button		N/A
	For CB with multiple current ratings, the maximum value is marked, the adjusted value indicated without ambiguity		N/A
	For rail-mounted circuit-breakers, appropriate rail(s) shall be indicated in the manufacturer's documentation		P
	Marking shall be indelible and easily legible (not on removable parts), 15 s with water, 15 s with hexane (see cl. 9.3)		P
8.	**REQUIREMENTS FOR CONSTRUCTION AND OPERATION**		
8.1.1	**General**		P
	Circuit-breakers shall be so designed and constructed that, in normal use, their performance is reliable and without danger to the user or surroundings		P
8.1.2	**Mechanism**		P
	The moving contact shall be mechanically coupled so that all poles make and break together, whether operated manually or automatically, even if an overload occurs on one pole only	Only for A_{1-2}	P
	The switched neutral shall close before and open after the protected pole (s)		N/A
	Neutral pole having adequate making and breaking capacity and CB with independent manual operation: all poles operate together including neutral pole		N/A
	CB shall have a trip free mechanism		P
	It shall be possible to switch the CB on and off by hand		P
	No intermediate position of the contacts		P
	Position of contacts shall be indicated		P
	Indication visible from the outside		P

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	If the indication is on the actuating means, it shall, when released, automatically take up or stay in the position corresponding to that of the moving contacts; operating means shall have two different rest positions, except that, for automatic operation, a third distinct rest position may be provided		P
	If a separate mechanical indicator is used to indicate the position of the main contacts, colour red shall be used for the on position and green for the off position.		N/A
	The action of the mechanism shall not be influenced by the position of enclosures		P
	If the cover is used as a guiding means for push-button, it shall not be possible to remove this button from the outside		N/A
	Operating means securely fixed, not possible to remove them without a tool		P
	For the up-down operating means the contacts shall be closed by the up movement.		P
8.1.3	**Clearances and creepage distances and operation**		P
	The minimum required clearances and creepage distances are based on the CB being designed for operating in an environment with pollution degree 2		P
	Parts of PCBs connected to live parts and protected against pollution by the use of a type 2 protection according to IEC 60664-3 are exempted from this verification		N/A
	The insulating materials are classified into material groups on the basis of their comparative tracking index (CTI) according to IEC 60664-1	175V IIIa	P
	For clearances on printed wiring material, footnote 3 in Table F.2 of IEC 60664-1:2007 applies. For creepage distances on printed wiring material, the distances from Table F.4 of IEC 60664-1:2007 for pollution degree 1 can be applied only if protected with a coating meeting IEC 60664-3 requirements and tests		N/A
8.1.3.1	Clearances		P
	Compliance for item 1 in Table 4 is checked by measurement and by the test of 9.7.5.4. The test is carried out with samples not submitted to the humidity treatment described in 9.7.1		P
	Compliance as regards items 2 and 4 in Table 4 is checked by measurement and, if the clearances are reduced, by the tests of 9.7.5.2		P

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Clause	Requirement + Test	Result - Remark		Verdict
	The clearances of items 2 and 4 (except accessible surface after installation) 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, compliance as regards items 2 and 4 is always checked by the test of 9.7.5.2			N/A
	Compliance as regards item 3 in Table 4 is checked by measurement			N/A
	Minimum clearances (see table 4)			P
	Clearances [mm] Uimp			--
	4 kV (see table 4) 2,5 kV (see table 4)	☒ ☐		--
		minimum clearances [mm]		--
	1.between live parts (of the main circuits) which are separated when the CB is in off position ..... :	4,99mm	4,99mm	P
	2.between live parts of different polarity ..... :		>10mm	P
	3.between circuits supplied from different sources, one of which being PELV or SELV..... :			N/A
	4.between live parts and			P
	- accessible surfaces of operating means..... :	>10mm	>10mm	P
	- screws or other means for fixing covers ..... :			N/A
	- surface on which the base is mounted ..... :	6,93mm	6,93mm	P
	- screws or other means for fixing the circuit breaker ..... :	6,93mm	6,93mm	P
	- metal covers or boxes..... :			N/A
	- other accessible metal parts ..... :	>10mm	>10mm	P
	- metal frames supporting the base (flush-type) . :			N/A
8.1.3.2	Creepage distances			P
	Compliance as regards items 1, 2, 3 and 4 of Table 4 is checked by measurement			P
	Minimum creepage distances (see table 4)			P
	Material group	☐ III_b ☒ III_a ☐ II ☐ I		--
		minimum creepage distances [mm]		--
	1.between live parts (of the main circuits) which are separated when the CB is in off position ..... :	>10mm	>10mm	P
	2.between live parts of different polarity ..... :		>10mm	P

IEC 60898-1				
Clause	Requirement + Test	Result - Remark		Verdict
	3.between circuits supplied from different sources, one of which being PELV or SELV..... :			N/A
	4.between live parts and			P
	- accessible surfaces of operating means..... :	>20mm	>20mm	P
	- screws or other means for fixing covers ..... :			N/A
	- surface on which the base is mounted ..... :	6,93mm	6,93mm	P
	- screws or other means for fixing the circuit breaker ..... :	6,93mm	6,93mm	P
	- metal covers or boxes..... :			N/A
	- other accessible metal parts ..... :	>20mm	>20mm	P
	- metal frames supporting the base (flush-type) . :			N/A
8.1.3.3	Solid insulation			P
	Compliance is checked by the tests according to 9.7.2, 9.7.3, 9.7.4 and 9.7.5, as applicable			P
8.1.4	**Screws, current-carrying parts and connections**			P
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use			P
	Screws for mounting of the CB not of the thread-cutting type			P
	Test according to cl. 9.4:			P
	- 10 times (screw Ø / torque Nm)	Ø___mm___Nm (see table 11) Ø___mm___Nm		N/A
	- 5 times (screw Ø / torque Nm)	Ø4,8mm 2,0Nm (see table 11) Ø___mm___Nm		P
	After test connections have not become loose nor electrical function impaired			P
8.1.4.2	Screws with a thread of insulating material ensured correct introduction			N/A
8.1.4.3	Electrical connection: 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- alloy 58% copper for worked cold parts		P
	- 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 9.16).		P
	The requirements of this subclause do not apply to contacts, magnetic circuits, heater elements, bimetals, shunts, electronic components, including printed circuit board or to screws, nuts, washers, clamping plates, similar parts of terminals and parts of the test circuit		P
	Compliance is checked by inspection in accordance with the manufacturer's declaration		P
8.1.5	**Terminals for external conductors**		--
	Compliance is checked by inspection and by the tests as relevant for the type of connection:		--
	by tests of clause 9.5 for screw-type terminals		P
	by specific tests for plug-in or bolt-on CBs included in this document		N/A
	by the tests of Annexes J, K		N/A
8.1.5.1	Terminals ensure the necessary contact pressure		P
9.5	Torque test:		P
	- torque (Nm); diameter (mm).....:	2,0Nm, Ø4,9mm	--
	- torque (Nm); diameter (mm).....:		--
	- torque (Nm); diameter (mm).....:		--
	- max. cross-sectional area (mm²).....:	25mm²	--
9.5.2	Pull test:		P
	Terminals shall be suitable for all types of conductors: rigid (solid or stranded) and flexible, unless otherwise specified by the manufacturer.	All types	--
	Min. cross-section solid / stranded / flexible (mm²).....:	1mm²/1,5 mm²/1mm²	--
	Max. cross-section solid / stranded / flexible (mm²).....:	6mm²/25 mm²/16mm²	--
	Torque $^2/_3$ (Nm) .....:	1,33Nm	--
	Pull for 1 min solid / stranded / flexible (N).....:	Min. cross-section 50/50/50N Max. cross-section 60/100/90N	P

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	During the test no noticeable move of conductor		P
9.5.3	Torque test:		P
	- torque $^{2}/_{3}$ (Nm).....:	1,33Nm	--
	- min. cross-sectional area (mm²).....:	1mm²	--
	- max. cross-sectional area (mm²).....:	25mm²	--
	The conductor shows no undue damage nor severed strands		P
	Terminals have not worked loose and no damage		P
9.5.4	Terminals fitted with the largest cross-section area specified in Table 5, for stranded copper conductor.		P
	Max. cross-section stranded (mm²).....:	25mm²	--
	Torque $^{2}/_{3}$ (Nm) .....:	1,33Nm	--
	After the test no strand of conductor escaped outside		P
8.1.5.2	Terminals allow the connection of conductors of the following cross-sectional areas: (table 5)		P

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict

	Rated current (A) / sections Range of nominal cross sections to be clamped* (mm²) Rigid (solid or stranded) conductors Flexible conductors **≤ 13** **1 to 2,5** **1 to 2,5** **> 13 ≤ 16** **1 to 4** **1 to 4** **> 16 ≤ 25** **1,5 to 6** **1,5 to 6** **> 25 ≤ 32** **2,5 to 10** **2,5 to 6** **> 32 ≤ 50** **4 to 16** **4 to 10** **> 50 ≤ 80** **10 to 25** **10 to 16** > 80 ≤ 100 16 to 35 16 to 25 > 100 ≤ 125 24 to 50 25 to 35	1—2,5mm²/10—25mm²	P
	*It is required that, for current ratings up to and including 50 A, terminals be designed to clamp solid conductors as well as rigid stranded conductors. Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm² up to 6 mm² be designed to clamp solid conductors only.		P
	- or terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors according to Annex L.		N/A
8.1.5.3	Means for clamping the conductors in the terminals not serve to fix any other component (See test sub-clause 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; ISO thread or equivalent (See tests of sub-clause 9.4 and 9.5.2)		P
8.1.5.6	Clamping of conductor without damage to the conductor (See test of sub-clause 9.5.3)		P
8.1.5.7	Clamping of conductor between metal surfaces (See tests of sub-clause 9.4 and 9.5.2)		P
8.1.5.8	Conductor shall not slip-out when the clamping screw or nuts are tightened (See test of sub-clause 9.5.4)		P
8.1.5.9	Terminals shall be properly fixed. No work loose when the clamping screws or nuts are tightened or loosened (See test of sub-clause 9.4)		P
8.1.5.10	Clamping screws or nuts of terminals for protective conductors adequately secured against accidental loosening		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.5.11	Pillar terminals shall allow full insertion and reliable clamping of the conductor		P
8.1.5.12	Screws and nuts of terminals for external conductors shall be in engagement with a metal thread, and the screws shall not be the thread cutting type		P
8.1.6	**Non-interchangeability**		N/A
	For circuit-breakers intended to be mounted on bases forming a unit therewith (plug-in or screw-in type) it shall not be possible, without the aid of a tool, to replace a circuit-breaker when mounted as for normal use by another of the same make having a higher rated current, compliance is checked by inspection		N/A
8.1.7	**Mechanical mounting of plug-in circuit-breakers**		N/A
8.1.7.1	The mechanical mounting of plug-in circuit-breakers, the retention of which does not depend solely on their plug-in connection(s), shall be reliable and have adequate stability		N/A
8.1.7.2	Plug-in type circuit-breakers, the retention of which does not depend solely on their plug-in connection(s) Compliance of the mechanical mounting is checked by the relevant test 9.13		N/A
8.1.7.3	Plug-in type circuit-breakers, the retention of which does depend solely on their plug-in connection(s) Compliance of the mechanical mounting is checked by the relevant test 9.13		N/A
8.14	**Electromagentic Immunity**		P
	Circuit-breakers for overcurrent protection for household and similar installations are not sesetive to normal electromagetic disturbance and the therefore no immunity tests are required		P
8.15	**Electromagnetic emission**		P
	Electromagnetic disturbance can only be generated by circuit-breakers for overcurrent protection for household and simliar installations during occasional switching or auomatic breaking operations. The duration of the distrubances is of the order of millisections		P
	The frequency, the level and the consequences of the these emissions are considered as part of the normal eletromagnetic enviroment of low-voltage installations. Therefore the requirements for electromagnetic emssions are deemed to be satisfied and no verifications is necessary		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.2	**Protection against electric shock**		P
	Live parts not accessible in normal use		P
	For CB, other than plug-in type, external parts, other than screws and other means for fixing covers, which are accessible shall be of insulating material		P
	Unless the live parts are within an internal enclosure of insulating material: Lining - reliable fixed, - adequate thickness and - mechanical strength		N/A
	Inlet openings for cables shall be in insulating material or be provided with bushings or similar devices in insulating material Such device - shall be reliable fixed - shall have adequate mechanical strength		N/A
	For plug-in CB, external parts, other than screws and other means for fixing covers, which are accessible shall be in insulating material		N/A
	Metallic operating means insulated from live parts		N/A
	Metal parts of the mechanism not accessible and insulated from accessible metal parts, metal frames (for flush-type), screws or other means for fixing the base		P
	Replacement of plug-in CB possible without touching live parts		N/A
	Lacquer or enamel not considered		P
8.1.3	**Creepage distances [mm] (see table 4)**		P
	Internal parts only	See above	P
9.6	**Test of protection against electric shock**		P
	This verification is applicable to those parts of circuit breakers which are exposed to the operator when mounted as for normal use		P
	Use of test finger so designed that each jointed can be turned through an angle of 90° with respect to the finger		P
	Circuit-breaker with enclosures of thermoplastic material are additional tested at 35 °C for 1 min with a force of 75 N	35 °C; 1min; 75 N	P
8.10	**Resistance to heat**		P
	CB sufficiently resistant to heat		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.14	**Test of resistance to heat**		P
9.14.1	Test:		P
	- without removable covers ..... 1 h (100 ± 2) °C	100°C	P
	- removable covers.....1 h (70 ± 2) °C		N/A
	After the test no access to live parts, marking still legible		P
9.14.2	Ball pressure test for external parts of insulating material (parts retaining current-carrying parts and parts of the protective circuit in position) T = 125°C Ø of impression ≤ 2 mm	A_{1-1}:125°C Impression: 1,1mm A_{1-2}:125°C Impression: 1,1mm	P
9.14.3	Ball pressure test for external parts of insulating material (parts not retaining current-carrying parts and parts of the protective circuit in position T = (70 ± 2)°C or T = ___ °C = (40 ± 2)°C + max. temperature rise of sub-clause 9.8 Ø of impression ≤ 2 mm	A_{1-1}:70°C Impression: 0,8mm A_{1-2}:70°C Impression: 0,8mm	P
8.12	**Resistance to rusting**		**P**
	Ferrous parts adequately protected against rusting		P
9.16	**Test of resistance to rusting:**		P
	- 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		P
	- 10 min at 95% humidity at 20°C		P
	- 10 min at 100°C		P
	No sign of rust		P

	TESTS „A_2“ 3 samples 1P;C63	**A_{2-1} A_{2-2} A_{2-3}**	--
8.11	**Resistance to abnormal heat and to fire**		**P**
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions		P
9.15	**Resistance to abnormal heat and to fire**		**P**
	Test performed on a complete CB		P

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Clause	Requirement + Test	Result - Remark			Verdict
	If it is not possible to perform the test on the complete end product, it is acceptable, according to IEC 60695-2-11:2014, 4.3, to remove the part under its entirety and test tis separately				P
	external parts retaining current-carrying parts and parts of the protective circuit in position .....(960 ± 15)°C	960°C	960°C	960°C	P
	all other external parts .....(650 ± 10)°C	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
	TESTS „A_2“ 3 samples 2P;C63	**A_{2-4}**	**A_{2-5}**	**A_{2-6}**	--
8.11	**Resistance to abnormal heat and to fire**				**P**
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions				P
9.15	**Resistance to abnormal heat and to fire**				**P**
	Test performed on a complete CB				P
	If it is not possible to perform the test on the complete end product, it is acceptable, according to IEC 60695-2-11:2014, 4.3, to remove the part under its entirety and test tis separately				P
	external parts retaining current-carrying parts and parts of the protective circuit in position .....(960 ± 15)°C	960°C	960°C	960°C	P
	all other external parts .....(650 ± 10)°C	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
	TESTS „A_2“ 3 samples 4P;C63	**A_{2-7}**	**A_{2-8}**	**A_{2-9}**	--

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Clause	Requirement + Test	Result - Remark			Verdict
8.11	**Resistance to abnormal heat and to fire**				**P**
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions				P
9.15	**Resistance to abnormal heat and to fire**				**P**
	Test performed on a complete CB				P
	If it is not possible to perform the test on the complete end product, it is acceptable, according to IEC 60695-2-11:2014, 4.3, to remove the part under its entirety and test tis separately				P
	external parts retaining current-carrying parts and parts of the protective circuit in position .....(960 ± 15)°C	960°C	960°C	960°C	P
	all other external parts .....(650 ± 10)°C	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

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Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „B“ 3 samples 1P;C63	**B_{-1} B_{-2} B_{-3}**	--
8.3	**Dielectric properties and isolating capability**		P
8.3.1	CB shall have adequate dielectric properties and shall ensure isolation:		P
8.3.2	Dielectric strength at power frequency		P
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition		P
8.3.3	Isolating capability		P
	Circuit-breakers shall be suitable for isolation. Compliance is checked by the verification of compliance with the minimum clearances and creepage distances of item 1 of table 4 and by tests of 9.7.5.1 and 9.7.5.3.		P
8.3.4	Dielectric strength at rated impulse withstand voltage (Uimp)		P
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.5.2.		P
9.7	**Test of dielectric properties**		P
9.7.5.4	Verification of resistance of the insulation of open contact and basic insulation against an impulse voltage (suitability for isolation)		P
	These tests are not preceded by the humidity treatment described in 9.7.1.		P
	The test is carried out on an CB 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 CB under test connected to the impulse generator.		P
	rated impulse withstand voltage [kV]:	4kV	--
	sea level of test laboratory [m]:	Sea level	--
	test voltage (acc. Table 15) [kV]:	6,2kV	--
	CB in open position (contacts in open position)		P
	The impulses are applied between:		--
	the line terminals connected together and the load terminals connected together		P

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Clause	Requirement + Test	Result - Remark			Verdict
	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
9.7.1	**Resistance to humidity**				P
9.7.1.1	Preparation of the circuit-breaker for test				P
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				P
9.7.1.2	Test conditions				P
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	Rf = 93 % T = 25°C			P
	Before being placed in the humidity cabinet, the sample is brought to a temperature between T °C and T °C +4 °C	27°C			P
9.7.1.3	Test procedure.				P
	The sample is kept in the cabinet for 48 h.				P
	In order to achieve the specified conditions within the cabinet, it is necessary to ensure constant circulation of the air within and , in general, to use a cabinet which is thermally insulated				P
9.7.1.4	Conditions of the circuit breaker after the tests.				P
	The sample show no damage within the meaning of this standard and shall withstand the tests of 9.7.2 and 9.7.3, 9.7.4 and 9.7.5.2				P
9.7.2	**Insulation resistance of the main circuit**				P
	After an interval between 30 min and 60 min flowing this treatment, the insulation resistance is measured 5 s after application of a d.c. voltage of approximately 500 V (0, +100 V), consecutively as follows:	[MΩ]	[MΩ]	[MΩ]	P
	a) In open position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position, in turn on each pole ≥ 2 MΩ	24300	16500	15000	P
	b) in closed position, between each pole in turn and the others connected together, electronic components connected between current paths being disconnected ≥ 2 MΩ	--	--	--	N/A
	c) in closed position, between all poles connected together and the frame ≥ 5 MΩ	99900	99900	99900	P

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Clause	Requirement + Test	Result - Remark			Verdict
	d) for circuit-breakers with metal enclosure having an internal lining of insulating material, between the frame and a metal foil in contact with the inner surface of the lining of the insulating material including bushings and similar devices ≥ 5 MΩ	--	--	--	N/A
9.7.3	**Dielectric strength of the main circuit**				P
	After the circuit-breakers have passed the tests of 9.7.2 the test voltage specified is applied for 1 min between the parts indicated in 9.7.2				P
	with electronic components, if any, being disconnected for the test				N/A
	a) 2000 V	2000V			P
	b) 2000 V				N/A
	c) 2000 V	2000V			P
	d) 2500 V				N/A
	No flashover or breakdown				P
9.7.4	**Insulation resistance and dielectric strength of the auxiliary circuits**				N/A
	Insulation resistance of auxiliary circuits measured with 500^{+100} V DC after 1 min:				--
	Where electronic components connected to the main circuit in normal service are used, the temporary connections for test shall be made so that no voltage between the incoming and outgoing sides of the components				N/A
	1) between all auxiliary circuits and the frame (MΩ) ≥ 2 MΩ				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 (MΩ) ≥ 2 MΩ				N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:				--
	Rated voltage of auxiliary circuits (a.c. or d.c.) — Test voltage (V) ≤ 30 — 600 > 30 ≤ 50 — 1000 > 50 ≤ 110 — 1500 > 110 ≤ 250 — 2000 > 250 ≤ 500 — 2500	V			--
	1) between all auxiliary circuits and the frame				N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
9.7.5.1	General testing procedure for the impulse withstand voltage tests		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
	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
	The surge impedance of the test apparatus 500Ω and surge protective devices disconnected before testing or		P
	When carrying out tests on a circuit-breaker incorporating components across the parts under test (e.g. surge protective components), an impulse generator with a virtual impedance of 2Ω shall be used		N/A
	The shape of the impulses is adjusted with the circuit-breaker under test connected to the impulse generator. For this purpose, appropriate voltage dividers and voltage sensors shall be used		P
	For a circuit-breaker incorporating components across the parts under test (e.g. surge protective components), the shape of the impulses is adjusted without connection of the CB to the impulse generator		N/A
9.7.5.2	Verification of clearances with the impulse withstand voltage		N/A
	If the measurement of clearances of items 2 and 4 in Table 4 shows a reduction of the required length, this test applies.		N/A
	The test is carried out on an CB fixed on a metal support and being in the closed position		N/A
	rated impulse withstand voltage [kV]:	kV	--
	see level of test laboratory [m]:	m	--
	test voltage (acc. Table 14) [kV]:	kV	--

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Clause	Requirement + Test	Result - Remark	Verdict
	a) in turn between each pole and the other poles connected together, electronic components connected between current paths being disconnected		N/A
	b) between all poles connected together and the frame including a metal foil or part in contact with the outer surface of the housing of insulating material but with the terminal areas kept completely free to avoid flashover between terminals and the metal foil		N/A
	c) for circuit-breakers with a metal enclosure having an internal lining of insulating material, between the frame and a metal foil in contact with the inner surface of the lining of insulating material, including bushings and similar devices		--
	No disruptive discharges during the test		N/A
	If, however, only one such disruptive discharge occurs, ten additional impulses having the same polarity as that which caused the disruptive discharge are applied, the connections being the same as those with which the failure occurred		N/A
	No further disruptive discharge shall occur		N/A
8.4	**Temperature rise**		P
	Temperature rise does not exceed the limiting values stated in table 6:	sect. 16mm²	P
9.8.2	Test current: I_N= (reach the steady-state value) Four-pole CB's: ☐ 1) Three poles loaded 2) One pole and neutral pole loaded ☐ 1) Four-poles loaded	I_N = 63A	P
	Ambient air temperature.....:	Tamb= 22,9°C	P
	Parts .....Temperature rise [K]	[K] [K] [K]	P
	L1	≤52 ≤56 ≤54	P
	L2	- - -	
	L3	- - -	
	L4(N)	- - -	
	Terminals for external connections ..... 60 K		P
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles ..... 40 K	≤10 ≤10 ≤12	P

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Clause	Requirement + Test	Result - Remark			Verdict
	External metallic parts of operating means .. 25 K	-	-	-	N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface ..... 60 K	≤47	≤53	≤47	P
9.8.5	Measurement of power losses	B_{-1}	B_{-2}	B_{-3}	P
	Power loss do not exceed the values stated in table 8	13W			P
	Test current: I_N = 63A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 7,9W	W	W	W	P
	L1	≤7,6	≤7,9	≤7,5	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
8.5	**Uninterrupted duty**				**P**
	Circuit-breakers operate reliable even after long service				P
9.9	**28 day test**				P
	28 cycles - 21 h with current - 3 h without current Cross-sectional area. 16mm²				P
	During the first period of current flow the temperature of the terminals shall be measured				P
	Ambient air temperature :	Tamb= 23,0°C			P
	Parts ..... Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections	≤56	≤57	≤56	P
	During the last period of current flow the temperature of the terminals shall be measured				P
	Ambient air temperature ..... :	Tamb= 23,0°C			P
	Parts ..... Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections	≤56	≤57	≤57	P
	The temperature rise does not exceed the value measured during the first period by more than 15 K				P
	Test current 1,45 I_N =91,4A				P
	- Tripping within	[s]	[s]	[s]	P

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Clause	Requirement + Test	Result - Remark			Verdict
	- 1h (≤ 63 A)	281	273	303	P
	- 2h (> 63 A)	-	-	-	P

	TESTS „B“ 3 samples 4P;C63	**B_{-4}** **B_{-5}** **B_{-6}**	--
8.3	Dielectric properties and isolating capability		P
8.3.1	CB shall have adequate dielectric properties and shall ensure isolation:		P
8.3.2	Dielectric strength at power frequency		P
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition		P
8.3.3	Isolating capability		P
	Circuit-breakers shall be suitable for isolation. Compliance is checked by the verification of compliance with the minimum clearances and creepage distances of item 1 of table 4 and by tests of 9.7.5.1 and 9.7.5.3.		P
8.3.4	Dielectric strength at rated impulse withstand voltage (Uimp)		P
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.5.2.		P
9.7	Test of dielectric properties		P
9.7.5.4	Verification of resistance of the insulation of open contact and basic insulation against an impulse voltage (suitability for isolation)		P
	These tests are not preceded by the humidity treatment described in 9.7.1.		P
	The test is carried out on an CB 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 CB under test connected to the impulse generator.		P
	rated impulse withstand voltage [kV]:	4kV	--
	sea level of test laboratory [m]:	Sea level	--
	test voltage (acc. Table 15) [kV]:	6,2kV	--
	CB in open position (contacts in open position)		P
	The impulses are applied between:		--

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Clause	Requirement + Test	Result - Remark			Verdict
	the line terminals connected together and the load terminals connected together				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
9.7.1	Resistance to humidity				P
9.7.1.1	Preparation of the circuit-breaker for test				P
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				P
9.7.1.2	Test conditions				P
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	Rf = 93 % T = 25°C			P
	Before being placed in the humidity cabinet, the sample is brought to a temperature between T °C and T °C +4 °C	27°C			P
9.7.1.3	Test procedure.				P
	The sample is kept in the cabinet for 48 h.				P
	In order to achieve the specified conditions within the cabinet, it is necessary to ensure constant circulation of the air within and , in general, to use a cabinet which is thermally insulated				P
9.7.1.4	Conditions of the circuit breaker after the tests.				P
	The sample show no damage within the meaning of this standard and shall withstand the tests of 9.7.2 and 9.7.3, 9.7.4 and 9.7.5.2				P
9.7.2	Insulation resistance of the main circuit				P
	After an interval between 30 min and 60 min flowing this treatment, the insulation resistance is measured 5 s after application of a d.c. voltage of approximately 500 V (0, +100 V), consecutively as follows:	[MΩ]	[MΩ]	[MΩ]	P
	a) In open position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position, in turn on each pole ≥ 2 MΩ	5610	5070	6290	P
	b) in closed position, between each pole in turn and the others connected together, electronic components connected between current paths being disconnected ≥ 2 MΩ	7790	7190	8230	P

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Clause	Requirement + Test	Result - Remark			Verdict
	c) in closed position, between all poles connected together and the frame ≥ 5 MΩ	30000	28600	31900	P
	d) for circuit-breakers with metal enclosure having an internal lining of insulating material, between the frame and a metal foil in contact with the inner surface of the lining of the insulating material including bushings and similar devices ≥ 5 MΩ	--	--	--	N/A
9.7.3	Dielectric strength of the main circuit				P
	After the circuit-breakers have passed the tests of 9.7.2 the test voltage specified is applied for 1 min between the parts indicated in 9.7.2				P
	with electronic components, if any, being disconnected for the test				N/A
	a) 2000 V	2000V			P
	b) 2000 V	2000V			P
	c) 2000 V	2000V			P
	d) 2500 V				N/A
	No flashover or breakdown				P
9.7.4	Insulation resistance and dielectric strength of the auxiliary circuits				N/A
	Insulation resistance of auxiliary circuits measured with 500^{+100} V DC after 1 min:				--
	Where electronic components connected to the main circuit in normal service are used, the temporary connections for test shall be made so that no voltage between the incoming and outgoing sides of the components				N/A
	1) between all auxiliary circuits and the frame (MΩ) ≥ 2 MΩ				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 (MΩ) ≥ 2 MΩ				N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:				--

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated voltage of auxiliary circuits (a.c. or d.c.) Test voltage (V) ≤ 30 600 > 30 ≤ 50 1000 > 50 ≤ 110 1500 > 110 ≤ 250 2000 > 250 ≤ 500 2500	V	--
	1) between all auxiliary circuits and the frame		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
9.7.5.1	General testing procedure for the impulse withstand voltage tests		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
	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
	The surge impedance of the test apparatus 500Ω and surge protective devices disconnected before testing or		P
	When carrying out tests on a circuit-breaker incorporating components across the parts under test (e.g. surge protective components), an impulse generator with a virtual impedance of 2Ω shall be used		N/A
	The shape of the impulses is adjusted with the circuit-breaker under test connected to the impulse generator. For this purpose, appropriate voltage dividers and voltage sensors shall be used		P
	For a circuit-breaker incorporating components across the parts under test (e.g. surge protective components), the shape of the impulses is adjusted without connection of the CB to the impulse generator		N/A
9.7.5.2	Verification of clearances with the impulse withstand voltage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	If the measurement of clearances of items 2 and 4 in Table 4 shows a reduction of the required length, this test applies.		N/A
	The test is carried out on an CB fixed on a metal support and being in the closed position		N/A
	rated impulse withstand voltage [kV]:	kV	--
	see level of test laboratory [m]:	m	--
	test voltage (acc. Table 14) [kV]:	kV	--
	a) in turn between each pole and the other poles connected together, electronic components connected between current paths being disconnected		N/A
	b) between all poles connected together and the frame including a metal foil or part in contact with the outer surface of the housing of insulating material but with the terminal areas kept completely free to avoid flashover between terminals and the metal foil		N/A
	c) for circuit-breakers with a metal enclosure having an internal lining of insulating material, between the frame and a metal foil in contact with the inner surface of the lining of insulating material, including bushings and similar devices		--
	No disruptive discharges during the test		N/A
	If, however, only one such disruptive discharge occurs, ten additional impulses having the same polarity as that which caused the disruptive discharge are applied, the connections being the same as those with which the failure occurred		N/A
	No further disruptive discharge shall occur		N/A
8.4	Temperature rise		P
	Temperature rise does not exceed the limiting values stated in table 6:	sect. 16mm²	P
9.8.2	Test current: I_N= (reach the steady-state value) Four-pole CB's: ☐ 1) Three poles loaded 2) One pole and neutral pole loaded ☒ 1) Four-poles loaded	I_N = 63A	P
	Ambient air temperature.....:	Tamb= 23,1°C	P
	Parts .....Temperature rise [K]	[K] [K] [K]	P
	L1	≤53 ≤50 ≤53	P
	L2	≤56 ≤53 ≤57	

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Clause	Requirement + Test	Result - Remark			Verdict
	L3	≤56	≤53	≤57	
	L4(N)	≤53	≤48	≤51	
	Terminals for external connections ..... 60 K				P
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles ..... 40 K	≤30	≤24	≤26	P
	External metallic parts of operating means .. 25 K	-	-	-	N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface..... 60 K	≤48	≤51	≤53	P
9.8.5	Measurement of power losses	B_{-4}	B_{-5}	B_{-6}	P
	Power loss do not exceed the values stated in table 8	13W			P
	Test current: I_N = 63A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 5,7W	W	W	W	P
	L1	≤5,0	≤5,2	≤5,1	P
	L2	⩽5,2	⩽5,7	⩽5,2	
	L3	⩽5,3	⩽5,5	⩽5,2	
	L4(N)	⩽5,0	⩽5,7	⩽5,0	
8.5	Uninterrupted duty				**P**
	Circuit-breakers operate reliable even after long service				P
9.9	28 day test				P
	28 cycles - 21 h with current - 3 h without current Cross-sectional area. 16mm²				P
	During the first period of current flow the temperature of the terminals shall be measured				P
	Ambient air temperature :	Tamb= 23,0°C			P
	Parts .....Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections	≤57	≤57	≤57	P
	During the last period of current flow the temperature of the terminals shall be measured				P

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Clause	Requirement + Test	Result - Remark			Verdict
	Ambient air temperature.....:	Tamb= 23,0°C			P
	Parts .....Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections	≤58	≤58	≤58	P
	The temperature rise does not exceed the value measured during the first period by more than 15 K				P
	Test current 1,45 I_N =91,4A				P
	- Tripping within	[s]	[s]	[s]	P
	- 1h (≤ 63 A)	231	209	215	P
	- 2h (> 63 A)	-	-	-	P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „B“ 3 samples 1P;B63	**B_{-7}**	**B_{-8}**	**B_{-9}**	--
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:	sect. 16mm²			P
9.8.2	Test current: I_N= (reach the steady-state value) Four-pole CB‘s: ☐ 1) Three poles loaded 2) One pole and neutral pole loaded ☐ 1) Four-poles loaded	I_N = 63A			P
	Ambient air temperature.....:	Tamb= 22,6°C			P
	Parts .....Temperature rise [K]	[K]	[K]	[K]	P
	L1	≤51	≤50	≤51	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	Terminals for external connections ..... 60 K				P
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles ..... 40 K	≤11	≤10	≤10	P
	External metallic parts of operating means .. 25 K	-	-	-	N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface..... 60 K	≤46	≤45	≤46	P
9.8.5	Measurement of power losses	B_{-7}	B_{-8}	B_{-9}	P
	Power loss do not exceed the values stated in table 8	13W			P
	Test current: I_N = 63A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 7,1W	W	W	W	P
	L1	≤7,1	≤6,7	≤6,6	P
	L2	-	-	-	
	L3	-	-	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	L4(N)	- - -	

	TESTS „B“ 3 samples 4P;B63	**B-10**	**B-11**	**B-12**	--
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:	sect. 16mm²			P
9.8.2	Test current: I_N= (reach the steady-state value) Four-pole CB‘s: ☐ 1) Three poles loaded 2) One pole and neutral pole loaded ☒ 1) Four-poles loaded	I_N = 63A			P
	Ambient air temperature.....:	Tamb= 22,9°C			P
	Parts .....Temperature rise [K]	[K]	[K]	[K]	P
	L1	≤52	≤51	≤51	P
	L2	≤56	≤56	≤57	
	L3	≤57	≤56	≤58	
	L4(N)	≤50	≤53	≤49	
	Terminals for external connections ..... 60 K				P
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles ..... 40 K	≤28	≤26	≤28	P
	External metallic parts of operating means .. 25 K	-	-	-	N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface..... 60 K	≤50	≤49	≤52	P
9.8.5	Measurement of power losses	B-10	B-11	B-12	P
	Power loss do not exceed the values stated in table 8	13W			P
	Test current: I_N = 63A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 5,9W	W	W	W	P
	L1	≤5,1	≤5,1	≤4,9	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L2	⩽5,0	⩽5,5	⩽5,7	
	L3	⩽5,2	⩽5,4	⩽5,7	
	L4(N)	⩽4,9	⩽5,9	⩽5,0	

	TESTS „C“ 3 +3 samples 1P;C63				--
8.7	**Test „C_1“ Mechanical and electrical endurance**	**C_{1-1}**	**C_{1-2}**	**C_{1-3}**	P
	Circuit-breaker shall be capable to perform an adequate number of cycles with rated current				P
9.11.1	General test conditions				P
	Test: Test Voltage 243V (rated voltage 240V) Test Current 63,5A (rated current 63A) Power factor 0,87(0,85-0,9) Cross sect. area 16mm²				P
9.11.2	Test procedure				P
	The circuit-breaker is submitted to 4000 operating cycles with rated current.				P
	- $I_N \leq 32$ A: 2 s on - 13 s off				N/A
	- $I_N > 32$ A: 2 s on - 28 s off				P
	During the test the circuit-breaker shall be operated as in normal use.				P
9.11.3	Conditions of the circuit breaker after the tests.				P
	Following the test 9.11.2 the sample shall not show:				P
	- undue wear				P
	- discrepancy between the position of the moving contacts and corresponding position of the Indicating device				P
	- damage to the enclosure permitting access to live parts by test finger (see 9.6)				P
	- loosening of electrical or mechanical connections				P
	- seepage of sealing compound				P
	Moreover test current .....2,55 I_N_____A	160,7A			P
	Opening time not less 1 s or more than	[s]	[s]	[s]	P
	- 60 s (≤ 32 A)	-	-	-	N/A

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Clause	Requirement + Test	Result - Remark			Verdict
	- 120 s (> 32 A)	21	27	26	P
	Dielectric strength reduced to 1500 V				P
9.12.11.2	**Test at reduced short-circuit currents**				P
9.12.11.2.1	**Test on all circuit-breakers**				P
	Test at reduced short-circuit currents: Fig. 3				P
	Test current:	Obtained			--
	- 500 A or 10 In	I test =639A			--
	Test voltage 1,05 Un	Un =252V			--
	Power factor 0,93-0,98	0,96			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =35 mm			P
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value	882A			--
	Sequence: 6 x "O" and 3 x "CO"	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 11,3\ kA^2s$	3,35	11,3	7,39	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12	Verification of the circuit-breaker after short-circuit tests				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit –breaker is in the open position	**C_{1-1}** [mA]	**C_{1-2}** [mA]	**C_{1-3}** [mA]	P
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Electric strength test:		P
	Test voltage 1500 V (see 9.7.3)	1500V	P
	a)	1500V	P
	b)	-	N/A
	c)	1500V	P
	d) 2000 V	-	N/A

	TESTS „C“ 3 +3 samples 4P;C63				--
8.7	**Test „C_1“ Mechanical and electrical endurance**	**C_{1-4}**	**C_{1-5}**	**C_{1-6}**	P
	Circuit-breaker shall be capable to perform an adequate number of cycles with rated current				P
9.11.1	General test conditions				P
	Test: Test Voltage 418V (rated voltage 415V) Test Current 63,7A (rated current 63A) Power factor 0,87(0,85-0,9) Cross sect. area 16mm²				P
9.11.2	Test procedure				P
	The circuit-breaker is submitted to 4000 operating cycles with rated current.				P
	- $I_N \leq 32$ A: 2 s on - 13 s off				N/A
	- $I_N > 32$ A: 2 s on - 28 s off				P
	During the test the circuit-breaker shall be operated as in normal use.				P
9.11.3	Conditions of the circuit breaker after the tests.				P
	Following the test 9.11.2 the sample shall not show:				P
	- undue wear				P
	- discrepancy between the position of the moving contacts and corresponding position of the Indicating device				P
	- damage to the enclosure permitting access to live parts by test finger (see 9.6)				P
	- loosening of electrical or mechanical connections				P
	- seepage of sealing compound				P
	Moreover test current .....2,55 I_N_____A	160,7A			P

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Clause	Requirement + Test	Result - Remark	Verdict

	Opening time not less 1 s or more than	[s]	[s]	[s]	P
	- 60 s (≤ 32 A)	-	-	-	N/A
	- 120 s (> 32 A)	29	27	25	P
	Dielectric strength reduced to 1500 V				P

9.12.11.2	**Test at reduced short-circuit currents**				P
9.12.11.2.1	**Test on all circuit-breakers**				P
	Test at reduced short-circuit currents: Fig. 3				P
	Test current:	Obtained			--
	- 500 A or 10 In	I test= 639A			--
	Test voltage 1,05 Un	Un = 252V			--
	Power factor 0,93-0,98	0,96			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" = 35mm			P
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value	885A			--
	Sequence: 6 x "O" and 3 x "CO"	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 21,5\ kA^2s$	19,0	11,4	21,5	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12	Verification of the circuit-breaker after short-circuit tests				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit –breaker is in the open position	**C_{1-4}** [mA]	**C_{1-5}** [mA]	**C_{1-6}** [mA]	P
	The leakage current shall not exceed 2 mA L1	0,001	0,002	0,001	P
	L2	0,001	0,001	0,001	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L3	0,002	0,002	0,001	P
	L4(N)	0,001	0,001	0,001	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)	1500V			P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V	-			N/A

9.12.11.2.2	**Test „C_2“ Short-circuit test on circuit-breakers for use in IT systems** 1P;C63				--
	Test current:				--
	- 500 A or 1,2 times the upper limit of the standard range of instantaneous tripping (see table 2) whichever is the higher, but < 2500 A. When tripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A	I test=762A			--
	Test voltage 1,05 Un	Un =435V			--
	Power factor 0,93-0,98	0,95			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =35mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value	1,05kA			--
	Sequence: ”O” + “CO” on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	--
	Shifted point 30 ° on the other protected pole	**C_{2-1}**	**C_{2-2}**	**C_{2-3}**	--
	Max. $I^2t \leq 5{,}08kA^2s$ L1	5,08	4,74	3,52	P
	L2	-	-	-	
	L3	-	-	-	
	L4 (N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P

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Clause	Requirement + Test	Result - Remark			Verdict
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**C_{2-1}** [mA]	**C_{2-2}** [mA]	**C_{2-3}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A

9.12.11.2.2	**Test „C_2“ Short-circuit test on circuit-breakers for use in IT systems** 2P;C63				--
	Test current:				--
	- 500 A or 1,2 times the upper limit of the standard range of instantaneous tripping (see table 2) whichever is the higher, but < 2500 A. When tripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A	I test=762A			--
	Test voltage 1,05 Un	Un =435V			--
	Power factor 0,93-0,98	0,95			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =35mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value	1,09kA			--
	Sequence: ”O” + “CO” on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	--
	Shifted point 30 ° on the other protected pole	**C_{2-4}**	**C_{2-5}**		--

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Clause	Requirement + Test	Result - Remark			Verdict
	Max. $I^2t \leq 5{,}39 kA^2s$ L1	4,25	5,39	-	P
	L2	4,38	4,17	-	
	L3	-	-	-	
	L4 (N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**C_{2-4}** [mA]	**C_{2-5}** [mA]	**-** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0.001	-	P
	L2	0,002	0,001	-	P
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A

9.12.11.2.2	**Test „C_2“ Short-circuit test on circuit-breakers for use in IT systems** 4P;C63		--
	Test current:		--
	- 500 A or 1,2 times the upper limit of the standard range of instantaneous tripping (see table 2) whichever is the higher, but < 2500 A. When tripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A	I test=762A	--
	Test voltage 1,05 Un	Un =435V	--
	Power factor 0,93-0,98	0,95	--

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Clause	Requirement + Test	Result - Remark	Verdict

9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =35mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value	1,06kA			--
	Sequence: "O" + "CO" on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	--
	Shifted point 30 ° on the other protected pole	**C_{2-6}**			--
	Max. $I^2t \leq 5,44kA^2s$ L1 L2 L3 L4 (N)	5,44 3,04 4,89 4,64			P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**C_{2-6}** [mA]			--
	The leakage current shall not exceed 2 mA L1	0,001			P
	L2	0,001			P
	L3	0,001			P
	L4(N)	0,002			P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples 1P;C63				--
8.6	**Automatic operation**				
8.6.1	Standard time-current zone				P
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.				P
9.10	**Tests „D_0“**	**D_O+D_{1-1}**	**D_O+D_{1-2}**	**D_O+D_{1-3}**	**P**
	I_N (A)	63A			--
	Sect. (mm²)	16mm²			--
	Instantaneous tripping current	☐ B	☒ C	☐ D	--
9.10.1	General				P
	If the test is made in a test chamber, it shall be made in still air; the volume of the test chamber shall be such as not to affect the test results				P
9.10.2	Test of time-current characteristic				P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	71,2A			P
	- 1 h ($I_N \leq 63$ A)				P
	- 2 h ($I_N > 63$ A)				N/A
	No tripping				P
	Then steadily increased within 5 s to 1,45 I_N (A)	91,4A			P
	- Tripping within	[s]	[s]	[s]	--
	- 1h (≤ 63 A)	92	66	88	P
	- 2h (> 63 A)	-	-	-	P
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	160,7A			P
	opening time not less than 1 s or more than	[s]	[s]	[s]	--
	- 60 s (≤ 32 A)	-	-	-	N/A
	- 120 s (> 32 A)	27	19	25	P
9.10.3	Test of instantaneous tripping and of correct opening of the contacts				P
9.10.3.1	General test conditions				P
	For the lower values of the test current the test is made once, at any convenient voltage.				P
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.				P
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min				P
	The tripping time of the O operation is measured				P

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Clause	Requirement + Test	Result - Remark	Verdict

	After each operation the indicating means shall show the open position of the contacts				P
9.10.3.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____A			--
	Opening time:	[s]	[s]	[s]	--
	≥ 0,1 s				N/A
	Test current 5 I_N (A), starting from cold	_____A			N/A
	Tripping less than 0,1 s				N/A
9.10.3.3	☒ For circuit-breakers of the C – Type				P
	Test current $5I_N$ (A), starting from cold	315A			P
	Opening time:	[s]	[s]	[s]	--
	≥ 0,1 s	1	1	1	P
	Test current 10 I_N (A), starting from cold	630A			P
	Tripping less than 0,1 s	13ms	11ms	15ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type				N/A
	Test current $10I_N$ (A), starting from cold	A			N/A
	Opening time:	[s]	[s]	[s]	--
	≥ 0,1 s				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold	A			N/A
	Tripping less than 0,1 s				N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____A			N/A
	Tripping within	[min]	[min]	[min]	--
	- 1h (≤ 63 A)				N/A
	- 2h (> 63 A)				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____A			N/A
	Tripping within	[min]	[min]	[min]	--
	- 1h (≤ 63 A)				N/A
	- 2h (> 63 A)				N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics				P

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Clause	Requirement + Test	Result - Remark			Verdict
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C			P
	Test current 1,13 I_N (A)	71,2A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	119,7A			P
	Tripping within	[s]	[s]	[s]	--
	- 1h (≤ 63 A)	72	51	67	P
	- 2h (> 63 A)	-	-	-	N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	40°C			P
	Test current I_N (A)	63A			P
	No tripping within				--
	- 1h (≤ 63 A)				P
	- 2h (> 63 A)				N/A

	Tests „D_1“	**D_O+D_{1-1}**	**D_O+D_{1-2}**	**D_O+D_{1-3}**	--
8.9	**Resistance to mechanical shock and impact**				P
	CB shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use				P
9.13.1	**Mechanical shock**				P
	- 50 falls on two sides of vertical board C				P
	- Vertical board turned 90°				P
	- 50 falls on two sides of vertical board C				P
	During the test the circuit-breakers shall not open				P
9.13.2	**Mechanical impact**				P
9.13.2.2	All types:				P
	- Impact test: 10 blows-height 10 cm, no damage				P
9.13.2.3	Screw-in types:				N/A
	- Torque 2,5 Nm for 1 min, no damage				N/A
9.13.2.4	CB intended to be mounted on a rail				P
	- downward vertical 50 N for 1 min				P
	- upward vertical 50 N for 1 min, no damage				P
9.13.2.5	Plug-in types				N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	The circuit-breaker are mounted in their normal position, complete with plug-in base but without cables and any cover plate				N/A
	A force of 20 N applied for 1min to the circuit-breaker (see fig 16).				N/A
	During this test the circuit-breaker part shall not become loose from the base and shall not show damage impairing further use.				N/A
9.12.11.3	**Test at 1500 A:**				P
	Prospective current of 1500 A - power factor 0,93 to 0,98				P
	If the neutral of a four-pole circuit-breaker is not marked by the manufacturer, four samples are tested using successively a different pole as the neutral				P
	Prospective current obtained (A)	1,55kA			--
	Power factor	0,94			--
	Test voltage 1,05 Un	252V			--
	Test circuit: figure	3			--
	T (min)	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =35mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			--
	Sequence	6O-2CO+1O in test circuit specified for three-pole circuit-breakers			--
	I_{Peak} (A) max. value	2,00kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 13,3 kA^2s$ L1	12,4	12,9	13,3	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--

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Clause	Requirement + Test	Result - Remark			Verdict
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit –breaker is in the open position	**$D_{O+}D_{1-1}$** [mA]	**$D_{O+}D_{1-2}$** [mA]	**$D_{O+}D_{1-3}$** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		$D_{O+}D_{1-1}$ [s]	**$D_{O+}D_{1-2}$** [s]	**$D_{O+}D_{1-3}$** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	47	51	42	P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples 4P;C63				--
8.6	**Automatic operation**				
8.6.1	Standard time-current zone				P
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.				P
9.10	**Tests „D_0“**	**D_O+D_{1-4}**	**D_O+D_{1-5}**	**D_O+D_{1-6}**	**P**
	I_N (A)	63A			--
	Sect. (mm²)	16mm²			--
	Instantaneous tripping current	☐ B	☒ C	☐ D	--
9.10.1	General				P
	If the test is made in a test chamber, it shall be made in still air; the volume of the test chamber shall be such as not to affect the test results				P
9.10.2	Test of time-current characteristic				P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	71,2A			P
	- 1 h ($I_N \leq 63$ A)				P
	- 2 h ($I_N > 63$ A)				N/A
	No tripping				P
	Then steadily increased within 5 s to 1,45 I_N (A)	91,4A			P
	- Tripping within	[s]	[s]	[s]	--
	- 1h (≤ 63 A)	87	59	77	P
	- 2h (> 63 A)	-	-	-	P
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	160,7A			P
	opening time not less than 1 s or more than	[s]	[s]	[s]	--
	- 60 s (≤ 32 A)	-	-	-	N/A
	- 120 s (> 32 A)	24	18	21	P
9.10.3	Test of instantaneous tripping and of correct opening of the contacts				P
9.10.3.1	General test conditions				P
	For the lower values of the test current the test is made once, at any convenient voltage.				P
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.				P
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min				P
	The tripping time of the O operation is measured				P

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Clause	Requirement + Test	Result - Remark	Verdict

	After each operation the indicating means shall show the open position of the contacts				P
9.10.3.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____A			--
	Opening time:	[s]	[s]	[s]	--
	≥ 0,1 s				N/A
	Test current 5 I_N (A), starting from cold	_____A			N/A
	Tripping less than 0,1 s				N/A
9.10.3.3	☒ For circuit-breakers of the C – Type				P
	Test current $5I_N$ (A), starting from cold	315AA			P
	Opening time:	[s]	[s]	[s]	--
	≥ 0,1 s	1	1	1	P
	Test current 10 I_N (A), starting from cold	630A			P
	Tripping less than 0,1 s	14ms	15ms	18ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type				N/A
	Test current $10I_N$ (A), starting from cold				N/A
	Opening time:	[s]	[s]	[s]	--
	≥ 0,1 s				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold				N/A
	Tripping less than 0,1 s				N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____A			N/A
	Tripping within	[min]	[min]	[min]	--
	- 1h (≤ 63 A)				N/A
	- 2h (> 63 A)				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	109,6A			P
	Tripping within	[s]	[s]	[s]	--
	- 1h (≤ 63 A)	80	51	72	P
	- 2h (> 63 A)	-	-	-	N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics				P

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Clause	Requirement + Test	Result - Remark			Verdict
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C			P
	Test current 1,13 I_N (A)	71,2A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	119,7A			P
	Tripping within	[s]	[s]	[s]	--
	- 1h (≤ 63 A)	64	42	69	P
	- 2h (> 63 A)	-	-	-	N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	40°C			P
	Test current I_N (A)	63A			P
	No tripping within				--
	- 1h (≤ 63 A)				P
	- 2h (> 63 A)				N/A

	Tests „D_1“	**D_O+D_{1-7}**	**D_O+D_{1-8}**	**D_O+D_{1-9}**	--
8.9	**Resistance to mechanical shock and impact**				P
	CB shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use				P
9.13.1	**Mechanical shock**				P
	- 50 falls on two sides of vertical board C				P
	- Vertical board turned 90°				P
	- 50 falls on two sides of vertical board C				P
	During the test the circuit-breakers shall not open				P
9.13.2	**Mechanical impact**				P
9.13.2.2	All types:				P
	- Impact test: 10 blows-height 10 cm, no damage				P
9.13.2.3	Screw-in types:				N/A
	- Torque 2,5 Nm for 1 min, no damage				N/A
9.13.2.4	CB intended to be mounted on a rail				P
	- downward vertical 50 N for 1 min				P
	- upward vertical 50 N for 1 min, no damage				P
9.13.2.5	Plug-in types				N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	The circuit-breaker are mounted in their normal position, complete with plug-in base but without cables and any cover plate				N/A
	A force of 20 N applied for 1min to the circuit-breaker (see fig 16).				N/A
	During this test the circuit-breaker part shall not become loose from the base and shall not show damage impairing further use.				N/A
9.12.11.3	**Test at 1500 A:**				P
	Prospective current of 1500 A - power factor 0,93 to 0,98				P
	If the neutral of a four-pole circuit-breaker is not marked by the manufacturer, four samples are tested using successively a different pole as the neutral				P
	Prospective current obtained (A)	1,54kA			--
	Power factor	0,96			--
	Test voltage 1,05 Un	437V			--
	Test circuit: figure	3			--
	T (min)	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =35mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			--
	Sequence	6O-3CO			--
	I_{Peak} (A) max. value	1,96kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 16,4 kA^2s$ L1 L2 L3 L4(N)	12,6 14,7 14,7 -	16,4 15,4 16,5 -	15,7 15,9 15,8 -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--

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Clause	Requirement + Test	Result - Remark			Verdict
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit –breaker is in the open position	**$D_{O+}D_{1-4}$** [mA]	**$D_{O+}D_{1-5}$** [mA]	**$D_{O+}D_{1-6}$** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,002	0,001	0,001	P
	L2	0,002	0,001	0,002	P
	L3	0,001	0,001	0,002	P
	L4(N)	0,001	0,001	0,001	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		$D_{O+}D_{1-4}$ [s]	**$D_{O+}D_{1-5}$** [s]	**$D_{O+}D_{1-6}$** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	42	81	67	P

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Clause	Requirement + Test	Result - Remark	Verdict

	Tests „D_1“ The neutral of a four-pole circuit-breaker is not marked by the manufacturer, four samples are tested using successively a different pole as the neutral	**D_O+D_1-7**	**D_O+D_1-8**	**D_O+D_1-9**	**D_O+D_1-10**	--
8.9	**Resistance to mechanical shock and impact**					P
	CB shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use					P
9.13.1	**Mechanical shock**					P
	- 50 falls on two sides of vertical board C					P
	- Vertical board turned 90°					P
	- 50 falls on two sides of vertical board C					P
	During the test the circuit-breakers shall not open					P
9.13.2	**Mechanical impact**					P
9.13.2.2	All types:					P
	- Impact test: 10 blows-height 10 cm, no damage					P
9.13.2.3	Screw-in types:					N/A
	- Torque 2,5 Nm for 1 min, no damage					N/A
9.13.2.4	CB intended to be mounted on a rail					P
	- downward vertical 50 N for 1 min					P
	- upward vertical 50 N for 1 min, no damage					P
9.13.2.5	Plug-in types					N/A
	The circuit-breaker are mounted in their normal position, complete with plug-in base but without cables and any cover plate					N/A
	A force of 20 N applied for 1min to the circuit-breaker (see fig 16).					N/A
	During this test the circuit-breaker part shall not become loose from the base and shall not show damage impairing further use.					N/A
9.12.11.3	**Test at 1500 A:**					P
	Prospective current of 1500 A - power factor 0,93 to 0,98					P
	If the neutral of a four-pole circuit-breaker is not marked by the manufacturer, four samples are tested using successively a different pole as the neutral					P
	Prospective current obtained (A)	1,54kA				--
	Power factor	0,96				--

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Clause	Requirement + Test	Result - Remark	Verdict

	Test voltage 1,05 Un	437V				--
	Test circuit: figure	3				--
	T (min)	3min				--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =35mm				--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: _____x_____x_____mm				--
	Sequence	6O-3CO				--
	I_{Peak} (A) max. value	2,07kA				--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 16,3kA^2s$ L1 L2 L3 L4(N)	6,60 7,53 8,61 -	8,35 7,34 9,64 -	8,15 7,30 10,8 -	7,17 16,3 10,9 -	P
	- No permanent arcing					P
	- No flash-over between poles or between poles and frame					P
	- No blowing of the fuses F and F′					P
	- Polyethylene foil shows no holes					P
	After the test:					--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.					P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit –breaker is in the open position	**D_O+D_{1-7}** [mA]	**D_O+D_{1-8}** [mA]	**D_O+D_{1-9}** [mA]	**D_O+D_{1-10}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,002	0,001	0,001	P
	L2	0,001	0,002	0,002	0,001	P
	L3	0,001	0,001	0,001	0,001	P
	L4(N)	0,001	0,001	0,001	0,001	P
	Electric strength test:					P
	Test voltage 1500 V (see 9.7.3)					P
	a)	1500V				P
	b)	1500V				P
	c)	1500V				P

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Clause	Requirement + Test	Result - Remark	Verdict

	d) 2000 V					N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A				P
	- Passed for 1h					P
	- Passed for 2h					N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A				P
		D_O+D_1-7 [s]	**D_O+D_1-8** [s]	**D_O+D_1-9** [s]	**D_O+D_1-10** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	38	56	51	50	P

	TESTS „D_0“ 1P;C2~C63					
8.6	**Automatic operation**					--
8.6.1	Standard time-current zone					--
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.					P
9.10	**Tests „D_0“**	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
	I_N (A)	6,0	10,0	16,0	20,0	--
	Sect. (mm²)	1,0	1,5	2,5	2,5	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
	I_N (A)	25,0	32,0	40,0	50,0	--
	Sect. (mm²)	4,0	6,0	10,0	10,0	--
		D_0-9	**D_0-19**	**D_0-20**		
	I_N (A)	63,0	2,0	4,0		
	Sect. (mm²)	16,0	1,0	1,0		
	Instantaneous tripping current	☐ B	☒ C	☐ D		--
9.10.2	Test of time-current characteristic					--
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
	- 1 h ($I_N \leq 63$ A)	6,78	11,3	18,1	22,6	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		28,3	36,2	45,3	56,5	--
		D_0-9	**D0-19**	**D0-20**		
		71,2	2,26	4,52		
		D_0-1	**D_0-2**	**D_0-3**	**D_0-4**	--
		>1h	>1h	>1h	>1h	P

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Clause	Requirement + Test	Result - Remark	Verdict

		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		>1h	>1h	>1h	>1h	P
		D_0-9	**D_0-19**	**D_0-20**		--
		>1h	>1h	>1h		P
	- 2 h (I_N > 63 A)					N/A
	No tripping					P
	Then steadily increased within 5 s to 1,45 I_N (A)	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		8,7	14,5	23,2	29,0	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		36,3	46,4	58,0	72,5	--
		D_0-9	**D_0-19**	**D_0-20**		
		91,4	2,9	5,8		
	- Tripping within	[s]	[s]	[s]	[s]	--
	- 1h (≤ 63 A)	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		92	75	54	77	P
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		95	84	104	67	P
		D_0-9	**D_0-19**	**D_0-20**		--
		90	75	64		P
	- 2h (> 63 A)					N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		15.3	25,5	40,8	51,0	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		63,8	81,6	102	128	--
		D_0-9	**D_0-19**	**D_0-20**		
		160,7	5,1	10,2		
	opening time not less than 1 s or more than	[s]	[s]	[s]	[s]	--
	- 60 s (≤ 32 A)	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		27	22	13	24	P
		D_0-5	**D_0-6**	**D0-19**	**D0-20**	--
		31	28	23	17	P
	- 120 s (> 32 A)	**D_0-7**	**D_0-8**	**D_0-9**		--
		32	15	27		P
9.10.3	Test of instantaneous tripping and of correct opening of the contacts					--
9.10.3.1	General test conditions					--

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Clause	Requirement + Test	Result - Remark	Verdict
	For the lower values of the test current the test is made once, at any convenient voltage.		--
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		--
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		--
	The tripping time of the O operation is measured		--
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☐ For circuit-breakers of the B – Type		--
	Test current $3I_N$ (A), starting from cold	_____A	--
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s		N/A
	Test current 5 I_N (A), starting from cold	_____A	--
	Tripping less than 0,1 s		N/A
9.10.3.3	☒ For circuit-breakers of the C – Type		--
	Test current $5I_N$ (A), starting from cold	**D_0-1** / **D_0-2** / **D_0-3** / **D_0-4**	--
		30 / 50 / 80 / 100	
		D_0-5 / **D_0-6** / **D_0-7** / **D_0-8**	
		125 / 160 / 200 / 250	
		D_0-9 / **D_0-19** / **D_0-20**	
		315 / 10 / 20	
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	**D_0-1** / **D_0-2** / **D_0-3** / **D_0-4**	P
		1 / 1 / 1 / 1	
		D_0-5 / **D_0-6** / **D_0-7** / **D_0-8**	
		1 / 1 / 1 / 1	
		D_0-9 / **D_0-19** / **D_0-20**	
		1 / 1 / 1	
	Test current $10I_N$ (A), starting from cold	**D_0-1** / **D_0-2** / **D_0-3** / **D_0-4**	--
		60 / 100 / 160 / 200	P
		D_0-5 / **D_0-6** / **D_0-7** / **D_0-8**	
		250 / 320 / 400 / 500	
		D_0-9 / **D_0-19** / **D_0-20**	
		630 / 20 / 40	
	Tripping less than 0,1 s	**D_0-1** / **D_0-2** / **D_0-3** / **D_0-4**	P

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Clause	Requirement + Test	Result - Remark	Verdict

		15ms	14ms	12ms	14ms	
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	
		12ms	13ms	9ms	12ms	
		D_0-9	**D_0-19**	**D_0-20**		
		9ms	15ms	15ms		
9.10.3.4	☐ For circuit-breakers of the D – Type					--
	Test current 10I_N (A), starting from cold					--
	Opening time:	[s]	[s]	[s]	[s]	--
						--
	≥ 0,1 s					P
	Test current 20 I_N (A), starting from cold					--
	Tripping less than 0,1 s	[ms]	[ms]	[ms]	[ms]	--
						--
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:					--
	Test current 1,1 It (A), (two pole) starting from cold	_____A				--
	Tripping within	[min] [min] [min]				--
	- 1h (≤ 63 A)					N/A
	- 2h (> 63 A)					N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____A				--
	Tripping within	[min] [min] [min]				--
	- 1h (≤ 63 A)					N/A
	- 2h (> 63 A)					N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics					--
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5 °C				--
	Test current 1,13 I_N (A)	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		6,78	11,3	18,1	22,6	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		28,3	36,2	45,2	56,5	--
		D_0-9	**D_0-19**	**D_0-20**		
		71,2	2,26	4,52		
	- Passed for 1h	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		>1h	>1h	>1h	>1h	P

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Clause	Requirement + Test	Result - Remark	Verdict

		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		>1h	>1h	>1h	>1h	P
		D_0-9	**D_0-19**	**D_0-20**		--
		>1h	>1h	>1h		P
	- Passed for 2h					N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		11,4	19,0	30,4	38,0	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		47,5	60,8	76,0	95,0	--
		D_0-9	**D_0-19**	**D_0-20**		
		119,7	3,8	7,6		
	Tripping within	[s]	[s]	[s]	[s]	--
	- 1h (≤ 63 A)	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	
		75	61	42	61	P
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		75	67	84	52	P
		D_0-9	**D_0-19**	**D_0-20**		--
		71	64	51		P
	- 2h (> 63 A)					N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	40°C				--
	Test current I_N (A)	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		6	10	16	20	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		25	32	40	50	--
		D_0-9	**D_0-19**	**D_0-20**		
		63	2	4		
	No tripping within					--
	- 1h (≤ 63 A)	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		>1h	>1h	>1h	>1h	P
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		>1h	>1h	>1h	>1h	P
		D_0-9	**D_0-19**	**D_0-20**		--
		>1h	>1h	>1h		P
	- 2h (> 63 A)					N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D_0“ 1P;B2~B63					
8.6	**Automatic operation**					--
8.6.1	Standard time-current zone					--
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.					P
9.10	**Tests „D_0“**	**D_0-10**	**D_0-11**	**D_0-12**	**D_0-13**	--
	I_N (A)	6,0	10,0	16,0	20,0	--
	Sect. (mm²)	1,0	1,5	2,5	2,5	--
		D_0-14	**D_0-15**	**D_0-16**	**D_0-17**	--
	I_N (A)	25,0	32,0	40,0	50,0	--
	Sect. (mm²)	4,0	6,0	10,0	10,0	--
		D_0-18	**D_0-21**	**D_0-22**		--
	I_N (A)	63,0	2,0	4,0		--
	Sect. (mm²)	16,0	1,0	1,0		--
	Instantaneous tripping current	☒ B	☐ C	☐ D		--
9.10.2	Test of time-current characteristic					--
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:					--
	- 1 h ($I_N \leq 63$ A)					N/A
	- 2 h ($I_N > 63$ A)					N/A
	No tripping					N/A
	Then steadily increased within 5 s to 1,45 I_N (A)					--
	- Tripping within	[min]				--
	- 1h (≤ 63 A)					N/A
	- 2h (> 63 A)					N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:					--
	opening time not less than 1 s or more than	[s]				--
	- 60 s (≤ 32 A)					N/A
	- 120 s (> 32 A)					N/A
9.10.3	Test of instantaneous tripping and of correct opening of the contacts					--
9.10.3.1	General test conditions					--
	For the lower values of the test current the test is made once, at any convenient voltage.					--

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Clause	Requirement + Test	Result - Remark				Verdict
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.					--
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min					--
	The tripping time of the O operation is measured					--
	After each operation the indicating means shall show the open position of the contacts					P
9.10.3.2	☒ For circuit-breakers of the B – Type					--
	Test current $3I_N$ (A), starting from cold	**D_0-10**	**D_0-11**	**D_0-12**	**D_0-13**	--
		18	30	48	60	--
		D_0-14	**D_0-15**	**D_0-16**	**D_0-17**	--
		75	96	120	150	--
		D_0-18	**D_0-21**	**D_0-22**		--
		189	6	12		--
	Opening time:	[s]	[s]	[s]	[s]	--
	≥ 0,1 s	**D_0-10**	**D_0-11**	**D_0-12**	**D_0-13**	--
		11	8	12	9	P
		D_0-14	**D_0-15**	**D_0-16**	**D_0-17**	--
		10	8	9	11	P
		D_0-18	**D_0-21**	**D_0-22**		--
		10	8	7		P
	Test current $5I_N$ (A), starting from cold	**D_0-10**	**D_0-11**	**D_0-12**	**D_0-13**	--
		30	50	80	100	--
		D_0-14	**D_0-15**	**D_0-16**	**D_0-17**	--
		125	160	200	250	--
		D_0-18	**D_0-21**	**D_0-22**		--
		315	10	20		--
	Tripping less than 0,1 s	[ms]	[ms]	[ms]	[ms]	--
		D_0-10	**D_0-11**	**D_0-12**	**D_0-13**	--
		14	15	17	34	P
		D_0-14	**D_0-15**	**D_0-16**	**D_0-17**	--
		12	17	16	47	P
		D_0-18	**D_0-21**	**D_0-22**		--
		11	14	16		P
9.10.3.3	☐ For circuit-breakers of the C – Type					--
	Test current $5I_N$ (A), starting from cold	_____A				--

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Clause	Requirement + Test	Result - Remark	Verdict
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s		N/A
	Test current 10I_N (A), starting from cold	_____A	--
	Tripping less than 0,1 s		N/A
9.10.3.4	☐ For circuit-breakers of the D – Type		--
	Test current 10I_N (A), starting from cold	_____A	N/A
	Opening time:		--
	≥ 0,1 s		N/A
	Test current 20 I_N (A), starting from cold	_____A	--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		--
	Test current 1,1 It (A), (two pole) starting from cold	_____A	--
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____A	--
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		--
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5 °C	--
	Test current 1,13 I_N (A)		--
	- Passed for 1h		N/A
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s		--
	Tripping within	[min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	40°C	--
	Test current I_N (A)		--

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Clause	Requirement + Test	Result - Remark	Verdict
	No tripping within		--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A

	TESTS „E_1“ 3 + 3 samples 1P;C6				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-1}**	**E_{1-2}**	**E_{1-3}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	253V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6102A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,67			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	3,10kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 18,4kA^2s$ L1 L2 L3 L4(N)	17,5 - - -	18,4 - - -	17,0 - - -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P

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Clause	Requirement + Test	Result - Remark	Verdict

	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	E_{1-1} [mA]	E_{1-2} [mA]	E_{1-3} [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,002	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	5,76A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	9,57A			P
		E_{1-1} [s]	E_{1-2} [s]	E_{1-3} [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	64	75	57	P

9.12.11.4.2	**Test „E_1“(Test at service short-circuit capacity) three phase tests for single circuit-breakers** 1P;C6	E_{1-4}	E_{1-5}	E_{1-6}	--
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	432V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6227A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,66			--
	Sequence ..... :	See table 21			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--

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Clause	Requirement + Test	Result - Remark			Verdict
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value.....:	2,64kA			--
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit –breaker is in the open position	**E_{1-4}** [mA]	**E_{1-5}** [mA]	**E_{1-6}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	5,76A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	9,57A			P
		E_{1-4} [s]	**E_{1-5}** [s]	**E_{1-6}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	55	83	70	P
	TESTS „E_1“ 3 + 3 samples 1P;C63				--

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Clause	Requirement + Test	Result - Remark	Verdict

9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-7}**	**E_{1-8}**	**E_{1-9}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	252V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6177A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,68			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	4,53kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 81,3kA^2s$ L1	70,8	81,3	58,1	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-7}** [mA]	**E_{1-8}** [mA]	**E_{1-9}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,003	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A

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Clause	Requirement + Test	Result - Remark			Verdict
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-7} [s]	**E_{1-8}** [s]	**E_{1-9}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	78	77	54	P
9.12.11.4.2	**Test „E_1“(Test at service short-circuit capacity) three phase tests for single circuit-breakers** 1P;C63	**E_{1-10}**	**E_{1-11}**	**E_{1-12}**	--
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	432V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6227A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,66			--
	Sequence ..... :	See table 21			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value ..... :	4,81kA			--
	- No permanent arcing				P

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Clause	Requirement + Test	Result - Remark			Verdict
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit –breaker is in the open position	**E_{1-10}** [mA]	**E_{1-11}** [mA]	**E_{1-12}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-10} [s]	**E_{1-11}** [s]	**E_{1-12}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	83	92	70	P

	TESTS „E_1“ 3 samples 2P;C6				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-13}**	**E_{1-14}**	**E_{1-15}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	438V			--
	Prospective current ..... :	6000A			--

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Clause	Requirement + Test	Result - Remark	Verdict

	Prospective current obtained ..... :	6080A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,69			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	2,91kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 12,3kA^2s$ L1	10,3	12,3	11,3	P
	L2	10,4	11,9	11,3	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-13}** [mA]	**E_{1-14}** [mA]	**E_{1-15}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P
	L2	0,002	0,001	0,002	P
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P

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Clause	Requirement + Test	Result - Remark			Verdict
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	5,76A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	9,57A			P
		E_{1-13} [s]	E_{1-14} [s]	E_{1-15} [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	82	61	48	P

	TESTS „E_1“ 3 samples 2P;C63				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-16}**	**E_{1-17}**	**E_{1-18}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	438V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6080A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,69			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	4,72kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 48,7kA^2s$ L1 L2 L3 L4(N)	47,7 48,7 - -	40,3 40,9 - -	39,3 39,9 - -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P

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Clause	Requirement + Test	Result - Remark			Verdict
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-16}** [mA]	**E_{1-17}** [mA]	**E_{1-18}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P
	L2	0,001	0,001	0,001	P
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-16} [s]	**E_{1-17}** [s]	**E_{1-18}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	53	59	72	P

	TESTS „E_1“ 3 samples 4P;C6				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-19}**	**E_{1-20}**	**E_{1-21}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	432V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6227A			--

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Clause	Requirement + Test	Result - Remark	Verdict

	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,66			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	3,02kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 18,7kA^2s$ L1 L2 L3 L4(N)	13,1 17,4 10,6 -	17,5 13,6 6,58 -	6,25 14,0 18,7 -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-19}** [mA]	**E_{1-20}** [mA]	**E_{1-21}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P
	L2	0,001	0,002	0,001	P
	L3	0,001	0,001	0,002	P
	L4(N)	0,001	0,002	0,001	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			N/A
	c)	1500V			P
	d) 2000 V				N/A

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Clause	Requirement + Test	Result - Remark			Verdict
	Test current 0.85x non-tripping current (1,13 I_N)	5,76A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	9,57A			P
		E_{1-19} [s]	**E_{1-20}** [s]	**E_{1-21}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	64	44	73	P

	TESTS „E_1“ 3 samples 4P;C63				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-22}**	**E_{1-23}**	**E_{1-24}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	432V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6227A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,66			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	5,10kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 54,0kA^2s$ L1 L2 L3 L4(N)	52,2 51,9 33,9 -	54,0 24,9 33,4 -	30,8 38,7 36,6 -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P

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Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-22}** [mA]	**E_{1-23}** [mA]	**E_{1-24}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P
	L2	0,001	0,001	0,001	P
	L3	0,003	0,001	0,002	P
	L4(N)	0,001	0,001	0,002	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-22} [s]	**E_{1-23}** [s]	**E_{1-24}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	55	78	62	P

	TESTS „E_1“ 3 + 3 samples 1P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-25}**	**E_{1-26}**	**E_{1-27}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	253V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6102A			--
	Power factor ..... :	0,65~0,70			--

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Clause	Requirement + Test	Result - Remark	Verdict

	Power factor obtained ..... :	0,67			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	1,61kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 3,89kA^2s$ L1	2,71	3,89	2,94	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-25}** [mA]	**E_{1-26}** [mA]	**E_{1-27}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,002	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P

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Clause	Requirement + Test	Result - Remark			Verdict
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-25} [s]	**E_{1-26}** [s]	**E_{1-27}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	62	41	75	P

9.12.11.4.2	**Test „E_1“(Test at service short-circuit capacity) three phase tests for single circuit-breakers** 1P;C2	**E_{1-28}**	**E_{1-29}**	**E_{1-30}**	--
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	432V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6227A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,66			--
	Sequence ..... :	See table 21			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value ..... :	1,42kA			--
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P

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Clause	Requirement + Test	Result - Remark			Verdict
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-28}** [mA]	**E_{1-29}** [mA]	**E_{1-30}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,002	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-28} [s]	**E_{1-29}** [s]	**E_{1-30}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	50	64	70	P

	TESTS „E_1“ 3 samples 2P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-31}**	**E_{1-32}**	**E_{1-33}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	438V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6080A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,69			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--

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Clause	Requirement + Test	Result - Remark			Verdict
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value..... :	1,46kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 5,87kA^2s$ L1 L2 L3 L4(N)	2,75 3,00 - -	2,05 2,21 - -	5,54 5,87 - -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	E_{1-31} [mA]	E_{1-32} [mA]	E_{1-33} [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P
	L2	0,001	0,001	0,001	P
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A

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Clause	Requirement + Test	Result - Remark			Verdict
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-31} [s]	**E_{1-32}** [s]	**E_{1-33}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	85	47	66	P
	TESTS „E_1“ 3 samples 4P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-34}**	**E_{1-35}**	**E_{1-36}**	**P**
	Service short-circuit capacity (Ics) ..... :	6000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	432V			--
	Prospective current ..... :	6000A			--
	Prospective current obtained ..... :	6227A			--
	Power factor ..... :	0,65~0,70			--
	Power factor obtained ..... :	0,66			--
	Sequence ..... :	O-t-CO-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	1,08kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 2,47kA^2s$ L1 L2 L3 L4(N)	1,67 2,47 1,20 -	1,29 2,22 0,68 -	1,88 0,59 1,32 -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--

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Clause	Requirement + Test	Result - Remark			Verdict
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-34}** [mA]	**E_{1-35}** [mA]	**E_{1-36}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P
	L2	0,002	0,001	0,001	P
	L3	0,002	0,001	0,002	P
	L4(N)	0,001	0,001	0,001	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-34} [s]	**E_{1-35}** [s]	**E_{1-36}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	54	81	42	P

	TESTS „E_1“ 3 + 3 samples 1P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-37}**	**E_{1-38}**	**E_{1-39}**	**P**
	Service short-circuit capacity (Ics) ..... :	4500A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	252V			--
	Prospective current ..... :	4500A			--
	Prospective current obtained ..... :	4590A			--
	Power factor ..... :	0,75~0,80			--
	Power factor obtained ..... :	0,76			--
	Sequence ..... :	O-t-O-t-CO			--

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Clause	Requirement + Test	Result - Remark	Verdict

	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	1,35kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 3,55kA^2s$ L1	3,55	2,88	3,18	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-37}** [mA]	**E_{1-38}** [mA]	**E_{1-39}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,002	0,001	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A

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Clause	Requirement + Test	Result - Remark			Verdict
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-37} [s]	**E_{1-38}** [s]	**E_{1-39}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	58	92	74	P
9.12.11.4.2	**Test „E_1“(Test at service short-circuit capacity) three phase tests for single circuit-breakers** 1P;C2	**E_{1-40}**	**E_{1-41}**	**E_{1-42}**	--
	Service short-circuit capacity (Ics) ..... :	4500A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	436V			--
	Prospective current ..... :	4500A			--
	Prospective current obtained ..... :	4598A			--
	Power factor ..... :	0,75~0,80			--
	Power factor obtained ..... :	0,76			--
	Sequence ..... :	See table 21			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value ..... :	2,11kA			--
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-40}** [mA]	**E_{1-41}** [mA]	**E_{1-42}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-40} [s]	**E_{1-41}** [s]	**E_{1-42}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	77	83	67	P

	TESTS „E_1“ 3 + 3 samples 1P;C63				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-43}**	**E_{1-44}**	**E_{1-45}**	**P**
	Service short-circuit capacity (Ics) ..... :	4500A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	252V			--
	Prospective current ..... :	4500A			--
	Prospective current obtained ..... :	4590A			--
	Power factor ..... :	0,75~0,80			--
	Power factor obtained ..... :	0,76			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--

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Clause	Requirement + Test	Result - Remark	Verdict

	I_{Peak} (A) max. value.....:	4,45kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 59{,}0kA^2s$ L1	52,2	59,0	47,2	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**$E_{1\text{-}43}$** [mA]	**$E_{1\text{-}44}$** [mA]	**$E_{1\text{-}45}$** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,002	0,001	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		$E_{1\text{-}43}$ [s]	**$E_{1\text{-}44}$** [s]	**$E_{1\text{-}45}$** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	70	79	83	P

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Clause	Requirement + Test	Result - Remark	Verdict

9.12.11.4.2	**Test „E_1"(Test at service short-circuit capacity) three phase tests for single circuit-breakers** 1P;C63	**E_{1-46}**	**E_{1-47}**	**E_{1-48}**	--
	Service short-circuit capacity (Ics) .....:	4500A			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	436V			--
	Prospective current .....:	4500A			--
	Prospective current obtained .....:	4598A			--
	Power factor .....:	0,75~0,80			--
	Power factor obtained .....:	0,76			--
	Sequence .....:	See table 21			--
	T (min) .....:	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value .....:	4,07kA			--
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-46}** [mA]	**E_{1-47}** [mA]	**E_{1-48}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,002	0,002	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P

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Clause	Requirement + Test	Result - Remark			Verdict
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-46} [s]	**E_{1-47}** [s]	**E_{1-48}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	87	46	81	P

	TESTS „E_1“ 3 samples 2P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-49}**	**E_{1-50}**	**E_{1-51}**	**P**
	Service short-circuit capacity (Ics) ..... :	4500A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	434V			--
	Prospective current ..... :	4500A			--
	Prospective current obtained ..... :	4602A			--
	Power factor ..... :	0,75~0,80			--
	Power factor obtained ..... :	0,76			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	2,81kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--

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Clause	Requirement + Test	Result - Remark			Verdict
	Max. $I^2t \leq 25{,}5kA^2s$ L1	1,54	2,42	25,4	P
	L2	1,69	2,61	25,5	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**$E_{1\text{-}49}$** [mA]	**$E_{1\text{-}50}$** [mA]	**$E_{1\text{-}51}$** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P
	L2	0,002	0,001	0,001	P
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		$E_{1\text{-}49}$ [s]	**$E_{1\text{-}50}$** [s]	**$E_{1\text{-}51}$** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	90	59	66	P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „E_1“ 3 samples 2P;C63				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-52}**	**E_{1-53}**	**E_{1-54}**	**P**
	Service short-circuit capacity (Ics) ..... :	4500A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	434V			--
	Prospective current ..... :	4500A			--
	Prospective current obtained ..... :	4602A			--
	Power factor ..... :	0,75~0,80			--
	Power factor obtained ..... :	0,76			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	5,02kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 133kA^2s$ L1 L2 L3 L4(N)	115 133 - -	81,7 97,2 - -	83,8 98,9 - -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-52}** [mA]	**E_{1-53}** [mA]	**E_{1-54}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L2	0,001	0,001	0,001	P
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-52} [s]	**E_{1-53}** [s]	**E_{1-54}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	83	49	87	P

	TESTS „E_1“ 3 samples 4P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-55}**	**E_{1-56}**	**E_{1-57}**	**P**
	Service short-circuit capacity (Ics) ..... :	4500A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	436V			--
	Prospective current ..... :	4500A			--
	Prospective current obtained ..... :	4598A			--
	Power factor ..... :	0,75~0,80			--
	Power factor obtained ..... :	0,76			--
	Sequence ..... :	O-t-CO-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--

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Clause	Requirement + Test	Result - Remark	Verdict

	I_{Peak} (A) max. value.....:	2,63kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 16,9kA^2s$ L1	3,63	9,03	12,3	P
	L2	9,94	12,0	4,70	
	L3	16,9	5,11	8,93	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-55}** [mA]	**E_{1-56}** [mA]	**E_{1-57}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,002	0,001	P
	L2	0,001	0,001	0,001	P
	L3	0,001	0,002	0,001	P
	L4(N)	0,001	0,001	0,001	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-55} [s]	**E_{1-56}** [s]	**E_{1-57}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	93	66	77	P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „E_1“ 3 samples 4P;C63				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-58}**	**E_{1-59}**	**E_{1-60}**	**P**
	Service short-circuit capacity (Ics) ..... :	4500A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	436V			--
	Prospective current ..... :	4500A			--
	Prospective current obtained ..... :	4598A			--
	Power factor ..... :	0,75~0,80			--
	Power factor obtained ..... :	0,76			--
	Sequence ..... :	O-t-CO-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	4,23kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 54,3kA^2s$ L1 L2 L3 L4(N)	36,2 35,5 19,6 -	37,0 10,2 30,6 -	54,3 30,3 34,8 -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-58}** [mA]	**E_{1-59}** [mA]	**E_{1-60}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L2	0,001	0,001	0,002	P
	L3	0,002	0,001	0,001	P
	L4(N)	0,001	0,001	0,001	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-58} [s]	**E_{1-59}** [s]	**E_{1-60}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	82	90	63	P

	TESTS „E_1“ 3 + 3 samples 1P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-61}**	**E_{1-62}**	**E_{1-63}**	**P**
	Service short-circuit capacity (Ics) .....:	3000A			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	254V			--
	Prospective current .....:	3000A			--
	Prospective current obtained .....:	3120A			--
	Power factor .....:	0,85~0,90			--
	Power factor obtained .....:	0,86			--
	Sequence .....:	O-t-O-t-CO			--
	T (min) .....:	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--

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Clause	Requirement + Test	Result - Remark	Verdict

	I_{Peak} (A) max. value.....:	1,34kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 3{,}21kA^2s$ L1	3,21	2,34	3,12	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**$E_{1\text{-}61}$** [mA]	**$E_{1\text{-}62}$** [mA]	**$E_{1\text{-}63}$** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		$E_{1\text{-}61}$ [s]	**$E_{1\text{-}62}$** [s]	**$E_{1\text{-}63}$** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	59	80	51	P

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Clause	Requirement + Test	Result - Remark	Verdict

9.12.11.4.2	**Test „E_1"(Test at service short-circuit capacity) three phase tests for single circuit-breakers** 1P;C2	**E_{1-64}**	**E_{1-65}**	**E_{1-66}**	--
	Service short-circuit capacity (Ics) .....:	3000A			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	437V			--
	Prospective current .....:	3000A			--
	Prospective current obtained .....:	3110A			--
	Power factor .....:	0,85~0,90			--
	Power factor obtained .....:	0,88			--
	Sequence .....:	See table 21			--
	T (min) .....:	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value .....:	1,46kA			--
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-64}** [mA]	**E_{1-65}** [mA]	**E_{1-66}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,003	0,001	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P

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Clause	Requirement + Test	Result - Remark			Verdict
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-64} [s]	**E_{1-65}** [s]	**E_{1-66}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	58	69	62	P

	TESTS „E_1“ 3 + 3 samples 1P;C63				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-67}**	**E_{1-68}**	**E_{1-69}**	**P**
	Service short-circuit capacity (Ics) ..... :	3000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	254V			--
	Prospective current ..... :	3000A			--
	Prospective current obtained ..... :	3120A			--
	Power factor ..... :	0,85~0,90			--
	Power factor obtained ..... :	0,86			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	3,47kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--

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Clause	Requirement + Test	Result - Remark			Verdict
	Max. $I^2t \leq 36,4kA^2s$ L1	36,4	28,2	32,8	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-67}** [mA]	**E_{1-68}** [mA]	**E_{1-69}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,002	0,001	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-67} [s]	**E_{1-68}** [s]	**E_{1-69}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	51	77	59	P

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Clause	Requirement + Test	Result - Remark	Verdict

9.12.11.4.2	**Test „E_1"(Test at service short-circuit capacity) three phase tests for single circuit-breakers** 1P;C63	**E_{1-70}**	**E_{1-71}**	**E_{1-72}**	--
	Service short-circuit capacity (Ics) .....:	3000A			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	437V			--
	Prospective current .....:	3000A			--
	Prospective current obtained .....:	3110A			--
	Power factor .....:	0,85~0,90			--
	Power factor obtained .....:	0,88			--
	Sequence .....:	See table 21			--
	T (min) .....:	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value .....:	3,18kA			--
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-70}** [mA]	**E_{1-71}** [mA]	**E_{1-72}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P

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Clause	Requirement + Test	Result - Remark			Verdict
	a)	1500V			P
	b)				N/A
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-70} [s]	**E_{1-71}** [s]	**E_{1-72}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	93	97	84	P

	TESTS „E_1“ 3 samples 2P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-73}**	**E_{1-74}**	**E_{1-75}**	**P**
	Service short-circuit capacity (Ics) ..... :	3000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	435V			--
	Prospective current ..... :	3000A			--
	Prospective current obtained ..... :	3070A			--
	Power factor ..... :	0,85~0,90			--
	Power factor obtained ..... :	0,87			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	1,34kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--

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Clause	Requirement + Test	Result - Remark			Verdict
	Max. $I^2t \leq 2{,}72kA^2s$ L1	2,32	2,12	1,11	P
	L2	2,72	2,28	1,22	
	L3	-	-	-	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**$E_{1\text{-}73}$** [mA]	**$E_{1\text{-}74}$** [mA]	**$E_{1\text{-}75}$** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P
	L2	0,001	0,001	0,001	P
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		$E_{1\text{-}73}$ [s]	**$E_{1\text{-}74}$** [s]	**$E_{1\text{-}75}$** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	64	83	92	P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „E_1“ 3 samples 2P;C63				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-76}**	**E_{1-77}**	**E_{1-78}**	**P**
	Service short-circuit capacity (Ics) ..... :	3000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	435V			--
	Prospective current ..... :	3000A			--
	Prospective current obtained ..... :	3070A			--
	Power factor ..... :	0,85~0,90			--
	Power factor obtained ..... :	0,87			--
	Sequence ..... :	O-t-O-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	3,32kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 40,8kA^2s$ L1 L2 L3 L4(N)	22,2 22,2 - -	40,8 40,5 - -	27,2 27,1 - -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-76}** [mA]	**E_{1-77}** [mA]	**E_{1-78}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,001	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L2	0,002	0,001	0,002	P
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-76} [s]	**E_{1-77}** [s]	**E_{1-78}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	74	89	82	P

	TESTS „E_1“ 3 samples 4P;C2				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-79}**	**E_{1-80}**	**E_{1-81}**	**P**
	Service short-circuit capacity (Ics) ..... :	3000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	437V			--
	Prospective current ..... :	3000A			--
	Prospective current obtained ..... :	3110A			--
	Power factor ..... :	0,85~0,90			--
	Power factor obtained ..... :	0,88			--
	Sequence ..... :	O-t-CO-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--

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Clause	Requirement + Test	Result - Remark	Verdict

	I_{Peak} (A) max. value.....:	1,52kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 5,22kA^2s$ L1	3,01	4,96	2,75	P
	L2	4,84	4,75	2,82	
	L3	3,27	4,51	5,22	
	L4(N)	-	-	-	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-79}** [mA]	**E_{1-80}** [mA]	**E_{1-81}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,002	0,001	P
	L2	0,001	0,001	0,001	P
	L3	0,001	0,002	0,002	P
	L4(N)	0,001	0,001	0,002	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	1,92A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	3,19A			P
		E_{1-79} [s]	**E_{1-80}** [s]	**E_{1-81}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	93	66	77	P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „E_1“ 3 samples 4P;C63				--
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-82}**	**E_{1-83}**	**E_{1-84}**	**P**
	Service short-circuit capacity (Ics) ..... :	3000A			--
	Test circuit: figure ..... :	3			--
	Test voltage 1,05 Un	437V			--
	Prospective current ..... :	3000A			--
	Prospective current obtained ..... :	3110A			--
	Power factor ..... :	0,85~0,90			--
	Power factor obtained ..... :	0,88			--
	Sequence ..... :	O-t-CO-t-CO			--
	T (min) ..... :	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” =45mm			--
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			--
	I_{Peak} (A) max. value ..... :	3,47kA			--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq 35{,}5kA^2s$ L1 L2 L3 L4(N)	35,5 29,3 18,6 -	30,2 25,1 33,3 -	12,7 24,3 31,4 -	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.=457V. The circuit – breaker is in the open position	**E_{1-82}** [mA]	**E_{1-83}** [mA]	**E_{1-84}** [mA]	--
	The leakage current shall not exceed 2 mA L1	0,001	0,001	0,002	P

IEC 60898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	L2	0,001	0,002	0,001	P
	L3	0,001	0,001	0,001	P
	L4(N)	0,001	0,002	0,001	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.3)				P
	a)	1500V			P
	b)	1500V			P
	c)	1500V			P
	d) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5A			P
		E_{1-82} [s]	**E_{1-83}** [s]	**E_{1-84}** [s]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	80	63	90	P

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Annex E		--
	Annex J		--
	Annex K		--
	Annex L		--

	TABLE: Heating Test 1P;C63				**P**
	Test voltage (V) ..... :		--		—
	Ambient (°C) ..... :		22,9°C		—
Thermocouple Locations		**max. temperature measured, (K)**			**max. temperature limit, (K)**
Temperature		B-1	B-2	B-3	--
Terminal		52	56	54	60
Handle		10	10	12	40
Enclosure		47	53	47	60
Supplementary information:N/A					

	TABLE: Heating Test 4P;C63				**P**
	Test voltage (V) ..... :		--		—
	Ambient (°C) ..... :		23,1 °C		—
Thermocouple Locations		**max. temperature measured, (K)**			**max. temperature limit, (K)**
Temperature		B-4	B-5	B-6	--
Terminal	L1	53	50	53	60
Terminal	L2	56	53	57	60
Terminal	L3	56	53	57	60
Terminal	L4	53	48	51	60
Handle		30	24	26	40
Enclosure		48	51	53	60
Supplementary information:N/A					

	TABLE: Heating Test 1P;B63				**P**
	Test voltage (V) ..... :		--		—
	Ambient (°C) ..... :		22,6 °C		—
Thermocouple Locations		**max. temperature measured, (K)**			**max. temperature limit, (K)**
Temperature		B-7	B-8	B-9	--
Terminal		51	50	51	60
Handle		11	10	10	40
Enclosure		46	45	46	60
Supplementary information:N/A					

	TABLE: Heating Test;4P;B63	**P**
	Test voltage (V) ..... : --	—
	Ambient (°C) ..... : 22,9°C	—

Thermocouple Locations	**max. temperature measured, (K)**			**max. temperature limit, (K)**
Temperature	B-10	B-11	B-12	--
Terminal L1	52	51	51	60
Terminal L2	56	56	57	60
Terminal L3	57	56	58	60
Terminal L4	50	53	49	60
Handle	28	26	28	40
Enclosure	50	49	52	60
Supplementary information:N/A				

	TABLE: Dielectric Strength 1P;C63	**P**

Test voltage applied between:	**Test potential applied (V)**	**Breakdown / flashover (Yes/No)**
In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position.	2000V	No
In off-position, between each pole in turn and the others connected together.	-	-
In on-position, between all poles connected together and the frame.	2000V	No
Supplementary information:N/A		

	TABLE: Dielectric Strength 4P;C63	**P**

Test voltage applied between:	**Test potential applied (V)**	**Breakdown / flashover (Yes/No)**
In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position.	2000V	No
In off-position, between each pole in turn and the others connected together.	2000V	No
In on-position, between all poles connected together and the frame.	2000V	No
Supplementary information:N/A		

	TABLE: insulation resistance measurements 1P;C63	**P**

Insulation resistance R between:	**R (MΩ)**	**Required R (MΩ)**

	B-1	B-2	B-3	
a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position	24300	16500	15000	≥ 2 MΩ
b) in off-position, between each pole in turn and the others connected together	--	--	--	-
c) in on-position, between all poles connected together and the frame	99900	99900	99900	≥ 5 MΩ
Supplementary information:N/A				

	TABLE: insulation resistance measurements 4P;C63	**P**

Insulation resistance R between:	**R (MΩ)**			**Required R (MΩ)**
	B-4	**B-5**	**B-6**	
a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position	5610	5070	6290	≥ 2 MΩ
b) in off-position, between each pole in turn and the others connected together	7790	7190	8230	≥ 2 MΩ
c) in on-position, between all poles connected together and the frame	30000	28600	31900	≥ 5 MΩ
Supplementary information:N/A				

	TABLE: Impact Resistance 1P;C63	**P**

Impacts per surface	**Surface tested**	**Impact energy (Nm)**	**Comments**
2 blows	Operating means	150g*9,8N/kg*10cm	No damage
4 blows	Lateral side of the sample	150g*9,8N/kg*10cm	No damage
4 blows	Between lateral side and operating means	150g*9,8N/kg*10cm	No damage
Supplementary information:N/A			

	TABLE: Impact Resistance 4P;C63	**P**

Impacts per surface	**Surface tested**	**Impact energy (Nm)**	**Comments**
2 blows	Operating means	150g*9,8N/kg*10cm	No damage
4 blows	Lateral side of the sample	150g*9,8N/kg*10cm	No damage
4 blows	Between lateral side and operating means	150g*9,8N/kg*10cm	No damage
Supplementary information:N/A			

	TABLE: Clearance And Creepage Distance Measurements 1P;C63	**P**

clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
between live parts (of the main circuits) which are separated when the CB is in off position	4000V	500V	4	4,99	4	>10
between live parts of different polarity	4000V	500V	4	-	4	-
between live parts and accessible surfaces of operating means	4000V	500V	4	>10	4	>20
between live parts and surface on which the base is mounted	4000V	500V	4	6,93	4	6,93
between live parts and screws or other means for fixing the circuit breaker	4000V	500V	4	6,93	4	6,93
between live parts and other accessible metal parts	4000V	500V	4	>10	4	>20
Supplementary information:N/A						

	TABLE: Clearance And Creepage Distance Measurements 4P;C63					P
clearance cl and creepage distance dcr at/of:	**Up (V)**	**U r.m.s. (V)**	**Required cl (mm)**	**cl (mm)**	**required dcr (mm)**	**dcr (mm)**
between live parts (of the main circuits) which are separated when the CB is in off position	4000V	500V	4	4,99	4	>10
between live parts of different polarity	4000V	500V	4	>10	4	>10
between live parts and accessible surfaces of operating means	4000V	500V	4	>10	4	>20
between live parts and surface on which the base is mounted	4000V	500V	4	6,93	4	6,93
between live parts and screws or other means for fixing the circuit breaker	4000V	500V	4	6,93	4	6,93
between live parts and other accessible metal parts	4000V	500V	4	>10	4	>20
Supplementary information:N/A						

	TABLE: Ball Pressure Test of Thermoplastics 1P;C63	**P**

Allowed impression diameter (mm) ..... :		≤ 2 mm	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Enclosure	-	125	1,1
Current-carrying	-	125	1,1
Operating meanings	-	70	0,8
Fixing meanings	-	70	0,8
Supplementary information:N/A			

	TABLE: Ball Pressure Test of Thermoplastics 4P;C63	**P**

Allowed impression diameter (mm) ..... :		≤ 2 mm	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Enclosure	-	125	1,1
Current-carrying	-	125	1,1
Operating meanings	-	70	0,8
Fixing meanings	-	70	0,8
Supplementary information:N/A			

	TABLE: Needle- flame test (NFT)	**N/A**

	TABLE : Glow wire test 1P;C63	**P**
	Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 960 °C	
	No visible flame and no sustained glowing	N/A
	Flames and glowing extinguish within 30 s	P
	No ignition of the tissue paper	P
	Parts of insulating material not necessary to retain current-carrying parts in position, even though in contact with them: test temperature 650 °C	
	No visible flame and no sustained glowing	P
	Flames and glowing extinguish within 30 s	N/A
	No ignition of the tissue paper	P

	TABLE : Glow wire test 2P;C63	**P**
	Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 960 °C	
	No visible flame and no sustained glowing	N/A

	Flames and glowing extinguish within 30 s	P
	No ignition of the tissue paper	P
	Parts of insulating material not necessary to retain current-carrying parts in position, even though in contact with them: test temperature 650 °C	
	No visible flame and no sustained glowing	P
	Flames and glowing extinguish within 30 s	N/A
	No ignition of the tissue paper	P

	TABLE : Glow wire test 4P;C63	**P**
	Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 960 °C	
	No visible flame and no sustained glowing	N/A
	Flames and glowing extinguish within 30 s	P
	No ignition of the tissue paper	P
	Parts of insulating material not necessary to retain current-carrying parts in position, even though in contact with them: test temperature 650 °C	
	No visible flame and no sustained glowing	P
	Flames and glowing extinguish within 30 s	N/A
	No ignition of the tissue paper	P

	TABLE: Threaded Part Torque Test 1P;C63	**P**

Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)
Screw	4,8	II	2,0
Supplementary information:N/A			

	TABLE: Threaded Part Torque Test 4P;C63	**P**

Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)
Screw	4,8	II	2,0
Supplementary information:N/A			

IEC60898_1D ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

Annex nº 1

ATTACHMENT TO TEST REPORT IEC 60898-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Circuit-breakers for over current protection for household and similar installations Part 1 - Circuit-breakers for a.c. operation		
Differences according to .....:	EN 60898-1:2019	
Attachment Form No. .....:	EU_GD_IEC60898_1D	
Attachment Originator .....:	DEKRA Certification B.V.	
Master Attachment .....:	2019-06-18	
CENELEC COMMON MODIFICATIONS (EN)		P
Test item particulars:	MCB	P
Type of circuit-breaker .....:	YCB7-63N	P
Energy limiting class .....:	☒ Class 1 ☐ Class 3	P
Value of rated operational voltage (Ue) and number of poles .....:	☒ 230/400V for 1P ☒ 400V for 2P/3P/4P ☒ 240/415V for 1P ☒ 415V for 2P/3P/4P ☒ 1 P ☒ 2 P ☒ 3 P ☒ 4 P	P
Value of rated short-circuit capacities above 10 000 A up to and including 25 000 A.....:	☐ 15000 A ☐ 20000 A ☐ 25000 A	N/A
Rated impulse withstand voltage (Uimp)	4 kV	P

IEC60898_1D ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	Sequence A_1 1P;C63	A_{1-1}	
6	**MARKING AND OTHER INFORMATION**		**--**
6.1	Standard marking:		--
	f) Rated short circuit capacity in A within a rectangle, without symbol “A” .....:	6000A	P
	h) calibration temperature, if different from 30°C		N/A
	m) . Energy limiting class in a square in accordance with annex ZA.		N/A
	Icn and the energy limiting class, when applied, marked both on the device and combined		N/A
	Irrespective of type (B, C or D), the manufacturer published in his literature the I2t characteristic	C	P
	For rail mounting circuit-breakers, appropriate rail(s) are indicated in manufacturer’s documentation.		P
6.2	Additional marking		--
	Additional marking to other standards (EN or IEC or other) is allowed under the follow conditions:		--
	- the circuit-breaker complies with all the requirements of the additional standard;		--
	- the relevant standard to which the additional marking refers is indicated adjacent to this marking and is clearly differentiated or separated from the standard marking according to cl. 6.1		--
6.3	Guidance table for marking		--
	Each CB shall be marked in a durable manner with all or, for small apparatus, according the guidance table for marking.		P
9.6	Test of protection against electric shock		--
	In case of knock-outs the test finger is applied with a force of 10 N		P

IEC60898_1D ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	Sequence A_1 4P;C63	A_{1-2}	
6	**MARKING AND OTHER INFORMATION**		**--**
6.1	Standard marking:		--
	f) Rated short circuit capacity in A within a rectangle, without symbol “A” .....:	6000A	P
	h) calibration temperature, if different from 30°C		N/A
	m) . Energy limiting class in a square in accordance with annex ZA.		N/A
	Icn and the energy limiting class, when applied, marked both on the device and combined		N/A
	Irrespective of type (B, C or D), the manufacturer published in his literature the I2t characteristic	C	P
	For rail mounting circuit-breakers, appropriate rail(s) are indicated in manufacturer’s documentation.		P
6.2	Additional marking		--
	Additional marking to other standards (EN or IEC or other) is allowed under the follow conditions:		--
	- the circuit-breaker complies with all the requirements of the additional standard;		--
	- the relevant standard to which the additional marking refers is indicated adjacent to this marking and is clearly differentiated or separated from the standard marking according to cl. 6.1		--
6.3	Guidance table for marking		--
	Each CB shall be marked in a durable manner with all or, for small apparatus, according the guidance table for marking.		P
9.6	Test of protection against electric shock		--
	In case of knock-outs the test finger is applied with a force of 10 N		P

	Short-circuit tests		
9.12	General		--
9.12.2	Value of the power frequency recovery voltage shall be equal to 110 % of the rated voltage.		P
9.12.3	Tolerances on test quantities		--

IEC60898_1D ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	Voltage (including recovery voltage) : 0, -5%		P
9.12.9.1	A circuit-breaker tested according to 9.12.9.2 needs not be tested according to 9.12.9.3.		P
9.12.9.2	In case no information is available, two grids, one above and one below the circuit-breaker, shall be used.		N/A
	For test currents up to and including 3000 A, the distance “a” is 35 mm.		P

	Sequence C_1 1P;C63	**C_{1-1} C_{1-2} C_{1-3}**	
9.11.1	For single-pole circuit-breakers rated 230/400 V the test is made at 230 V.		P
9.11.3	Dielectric strength reduced to 900 V	1500V	P
	Sequence C_2 : Short-circuit test on circuit-breakers for use in IT systems		--
9.12.11.2.2	Test voltage 105 % of 400 V	435 V	P

	Sequence C_1 4P;C63	**C_{1-4} C_{1-5} C_{1-6}**	
9.11.1	For single-pole circuit-breakers rated 230/400 V the test is made at 230 V.		N/A
9.11.3	Dielectric strength reduced to 900 V	1500V	P
	Sequence C_2 : Short-circuit test on circuit-breakers for use in IT systems		--
9.12.11.2.2	Test voltage 105 % of 400 V	435 V	P

	Sequence D 3 samples 1P;C63		
9.10	Tests: D_O	D_O+D_{1-1} D_O+D_{1-2} D_O+D_{1-3}	P
	If the tests are made in a test chamber, it is made in still air; the volume of the chamber has no influence on the test results.		P
9.10.3.2	☐ For circuit-breakers of the B – Type		N/A
	Test current 3In (A), starting from cold	A	N/A
	Opening time:	[s] [s] [s]	N/A
	- 0,1 s ≤ t ≤ 45 s (≤ 32A)		N/A
	- 0,1 s ≤ t ≤ 90 s (> 32A)		N/A
9.10.2.2	Test current 2,55 In (A) starting from cold for:	A	N/A
	opening time not less than 1 s or more than	[s] [s] [s]	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)				N/A
9.10.3.3	☒ For circuit-breakers of the C – Type				P
	Test current 5 In (A), starting from cold	315A			P
	Opening time:	[s]	[s]	[s]	--
	- 0,1 s ≤ t ≤ 15 s (≤ 32A)	-	-	-	N/A
	- 0,1 s ≤ t ≤ 30 s (> 32A)	1	1	1	P
9.10.2.2	Test current 2,55 In (A) starting from cold for:	160,7A			P
	opening time not less than 1 s or more than	[s]	[s]	[s]	--
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	28	20	24	P
9.10.3.4	☐ For circuit-breakers of the D – Type				N/A
	Test current 10 In (A), starting from cold				N/A
	Opening time:	[s]	[s]	[s]	--
	- 0,1 s ≤ t ≤ 4 s (10 A < In ≤ 32 A)	-	-	-	N/A
	- 0,1 s ≤ t ≤ 8 s (10 A ≥ In > 32A)				N/A
	Test current 20 In (A) starting from cold				N/N
	Tripping less than 0,1 s				N/A
9.10.2.2	Test current 2,55 In(A) starting from cold for:				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s (≤ 32 A)	-	-	-	N/A
	- 120 s (> 32 A)	-	-	-	N/A

	Sequence D 3 samples 4P;C63		
9.10	Tests: D_O	D_O+D_{1-4} D_O+D_{1-5} D_O+D_{1-6}	P
	If the tests are made in a test chamber, it is made in still air; the volume of the chamber has no influence on the test results.		P
9.10.3.2	☐ For circuit-breakers of the B – Type		N/A
	Test current 3In (A), starting from cold	A	N/A
	Opening time:	[s] [s] [s]	N/A
	- 0,1 s ≤ t ≤ 45 s (≤ 32A)		N/A
	- 0,1 s ≤ t ≤ 90 s (> 32A)		N/A
9.10.2.2	Test current 2,55 In (A) starting from cold for:	A	N/A
	opening time not less than 1 s or more than	[s] [s] [s]	N/A

IEC60898_1D ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)				N/A
9.10.3.3	☒ For circuit-breakers of the C – Type				P
	Test current 5 In (A), starting from cold	315A			P
	Opening time:	[s]	[s]	[s]	--
	- 0,1 s ≤ t ≤ 15 s (≤ 32A)		-	-	N/A
	- 0,1 s ≤ t ≤ 30 s (> 32A)	1	1	1	P
9.10.2.2	Test current 2,55 In (A) starting from cold for:	160,7A			P
	opening time not less than 1 s or more than	[s]	[s]	[s]	--
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	25	16	22	P
9.10.3.4	☐ For circuit-breakers of the D – Type				N/A
	Test current 10 In (A), starting from cold				N/A
	Opening time:	[s]	[s]	[s]	--
	- 0,1 s ≤ t ≤ 4 s (10 A < In ≤ 32 A)	-	-	-	N/A
	- 0,1 s ≤ t ≤ 8 s (10 A ≥ In > 32A)	-	-	-	N/A
	Test current 20 In (A) starting from cold	A			N/A
	Tripping less than 0,1 s	-	-	-	N/A
9.10.2.2	Test current 2,55 In(A) starting from cold for:	A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s (≤ 32 A)	-	-	-	N/A
	- 120 s (> 32 A)	-	-	-	N/A

	TESTS „D_0“ 9 samples 1P;C2~C63		
9.10.3	Test of instantaneous tripping and of correct opening of the contacts		--
9.10.3.1	General test conditions		--
	For the lower values of the test current the test is made once, at any convenient voltage.		--
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		--
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		--
	The tripping time of the O operation is measured		--

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Clause	Requirement + Test	Result - Remark				Verdict
	After each operation the indicating means shall show the open position of the contacts					P
9.10.3.2	☐ For circuit-breakers of the B – Type					--
	Test current $3I_N$ (A), starting from cold					--
	Opening time:	[s]	[s]	[s]	[s]	--
	≥ 0,1 s					--
	- 0,1s ≤ t ≤ 45s (≤ 32A)					N/A
	- 0,1s ≤ t ≤ 90s (> 32A)					N/A
	Moreover the CB shall perform following test:					--
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:					--
	opening time not less than 1 s or more than	[s]	[s]	[s]	[s]	--
	- 60 s (≤ 32 A)					N/A
	- 120 s (> 32 A)					N/A
9.10.3.3	☒ For circuit-breakers of the C – Type					--
	Test current $5I_N$ (A), starting from cold	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		30	50	80	100	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		125	160	200	250	--
		D_0-9	**D_0-19**	**D_0-20**		--
		315	10	20		--
	Opening time:	[s]	[s]	[s]	[s]	--
	≥ 0,1 s	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		1	1	1	1	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		1	1	1	1	--
		D_0-9	**D_0-19**	**D_0-20**		--
		1	1	1		--
	Moreover the CB shall perform following test:					--
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		15,3	25,5	40,8	51,0	--
		D_0-5	**D_0-6**	**D_0-7**	**D_0-8**	--
		63,8	81,6	102	128	--
		D_0-9	**D_0-19**	**D_0-20**		--
		161	5,1	10,2		--
	opening time not less than 1 s or more than	[s]	[s]	[s]	[s]	--

IEC60898_1D ATTACHMENT						
Clause	Requirement + Test	Result - Remark				Verdict
	- 60 s (≤ 32 A)	**D_0-1**	**D_0-2**	**D_0-3**	**D_0-4**	--
		27	20	14	23	P
		D_0-5	**D_0-6**	**D_0-19**	**D_0-20**	--
		30	27	20	16	P
	- 120 s (> 32 A)	**D_0-7**	**D_0-8**	**D_0-9**		--
		30	16	26		P
9.10.3.4	☐ For circuit-breakers of the D – Type					--
	Test current $10I_N$ (A), starting from cold					N/A
	Opening time:					--
	≥ 0,1 s					N/A
	Test current 20 I_N (A), starting from cold					--
	Tripping less than 0,1 s					N/A
	Moreover the CB shall perform following test:					
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____A				
	opening time not less than 1 s or more than					
	- 60 s (≤ 32 A)					N/A
	- 120 s (> 32 A)					N/A

	TESTS „D_0“ 9 samples 1P;B2~B63					
9.10.3	Test of instantaneous tripping and of correct opening of the contacts					--
9.10.3.1	General test conditions					--
	For the lower values of the test current the test is made once, at any convenient voltage.					--
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.					--
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min					--
	The tripping time of the O operation is measured					--
	After each operation the indicating means shall show the open position of the contacts					P
9.10.3.2	☒ For circuit-breakers of the B – Type					--
	Test current $3I_N$ (A), starting from cold	**D_0-10**	**D_0-11**	**D_0-12**	**D_0-13**	--
		18	30	48	60	--
		D_0-14	**D_0-15**	**D_0-16**	**D_0-17**	--
		75	96	120	150	--

IEC60898_1D ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

		D_0-18	**D_0-21**	**D_0-22**		--
		189	6	12		--
	Opening time:	[s]	[s]	[s]	[s]	--
	≥ 0,1 s	**D_0-10**	**D_0-11**	**D_0-12**	**D_0-13**	--
	- 0,1s ≤ t ≤ 45s (≤ 32A)	11	8	12	9	P
		D_0-14	**D_0-15**	**D_0-21**	**D_0-22**	--
		10	8	8	7	P
	- 0,1s ≤ t ≤ 90s (> 32A)	**D_0-16**	**D_0-17**	**D_0-18**		--
		9	10	11		P
	Moreover the CB shall perform following test:					--
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	**D_0-10**	**D_0-11**	**D_0-12**	**D_0-13**	--
		15,3	25,5	40,8	51,0	--
		D_0-14	**D_0-15**	**D_0-16**	**D_0-17**	--
		63,8	81,6	102	128	--
		D_0-18	**D_0-21**	**D_0-22**		--
		161	5,1	10,2		--
	opening time not less than 1 s or more than	[s]	[s]	[s]	[s]	--
	- 60 s (≤ 32 A)	**D_0-10**	**D_0-11**	**D_0-12**	**D_0-13**	--
		24	28	24	31	P
		D_0-14	**D_0-15**	**D_0-21**	**D_0-22**	--
		26	29	24	19	P
	- 120 s (> 32 A)	**D_0-16**	**D_0-17**	**D_0-18**		--
		25	30	25		P
9.10.3.3	☐ For circuit-breakers of the C – Type					--
	Test current 5I_N (A), starting from cold					N/A
	Opening time:					--
	≥ 0,1 s					N/A
	Moreover the CB shall perform following test:					
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____A				
	opening time not less than 1 s or more than					
	- 60 s (≤ 32 A)					N/A
	- 120 s (> 32 A)					N/A
9.10.3.4	☐ For circuit-breakers of the D – Type					--
	Test current 10I_N (A), starting from cold					N/A
	Opening time:					--

IEC60898_1D ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	≥ 0,1 s		N/A
	Test current 20 I_N (A), starting from cold		--
	Tripping less than 0,1 s		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____A	
	opening time not less than 1 s or more than		
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		N/A

IEC60898_1D ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

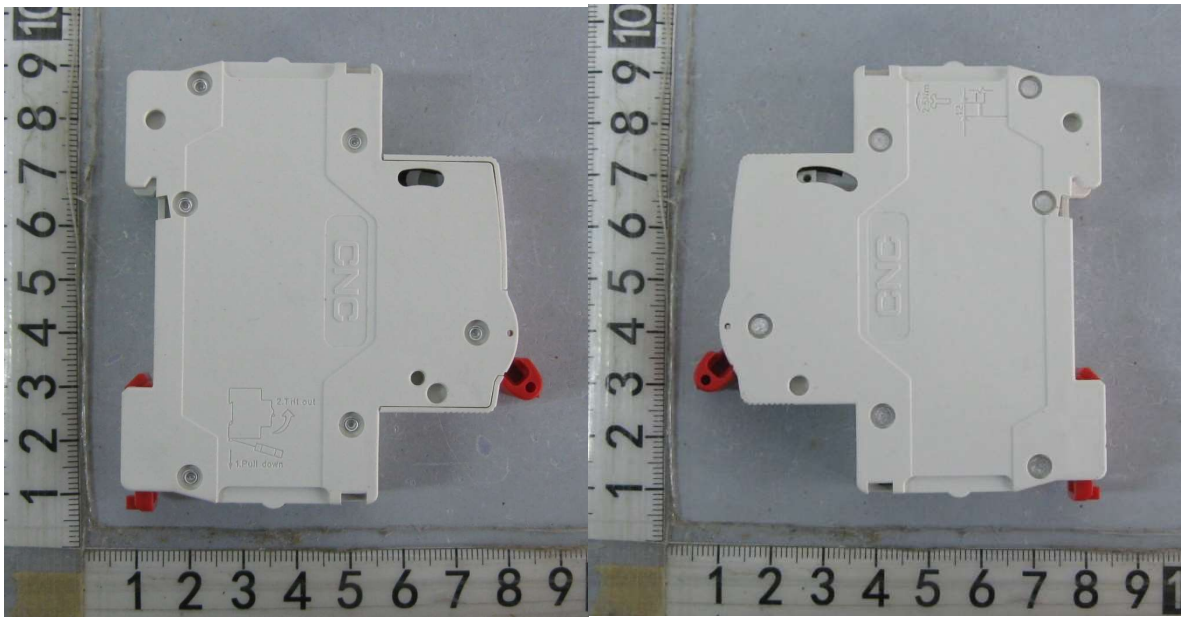
	Annex ZC	--
	EN 60898-1 **Special national conditions**	--
	For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.	--
J.1	**Austria, Czech Republic, Netherlands, Norway and Switzerland**	--
	The upper limit of current for use of screwless terminals is 16 A	N/A
J.3.3	**Austria, Belgium, Denmark, France, Germany, Italy, Portugal, Spain and Sweden**	--
	Only universal screwless type terminals are accepted.	N/A
K.1	**Belgium, Italy and Spain**	--
	The use of circuit-breakers with flat quick-connect terminations for rated currents up to and including 20 A is accepted.	N/A
K.8.2.2	**Belgium, Italy and Spain**	--
	The use for rated currents up to and including 20 A is accepted	N/A

Photographs

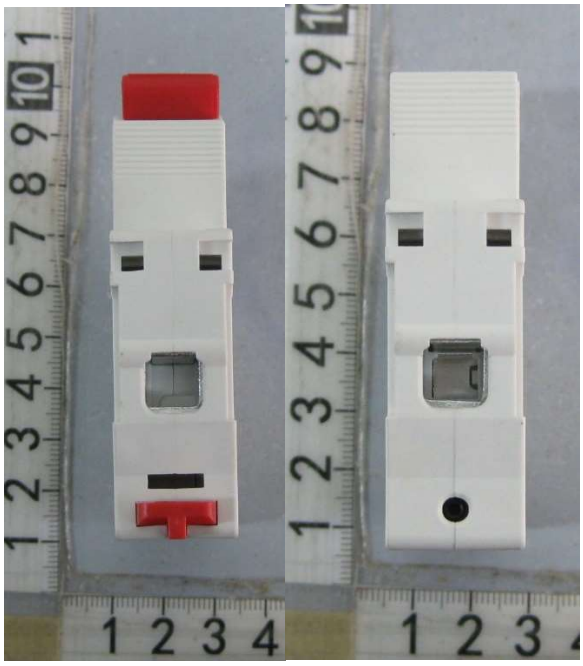
1P;C63

Over View

Side View

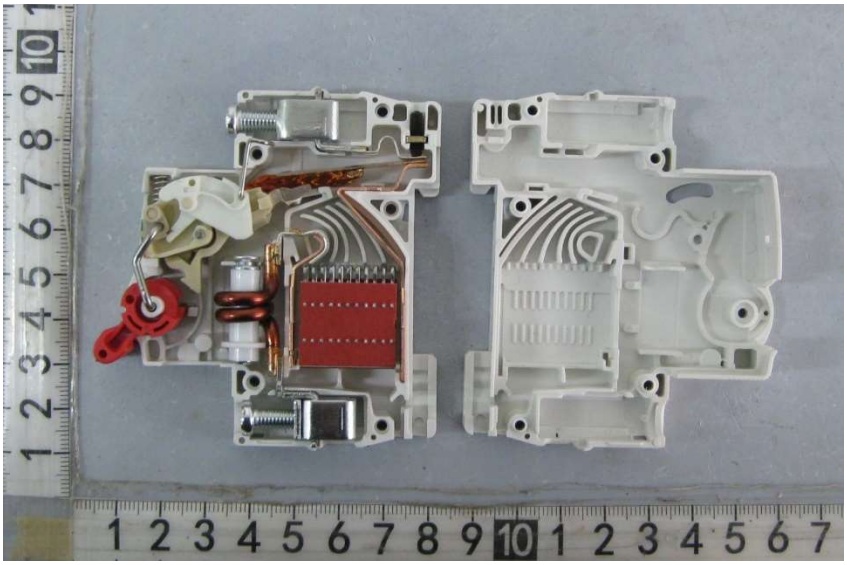


Side View



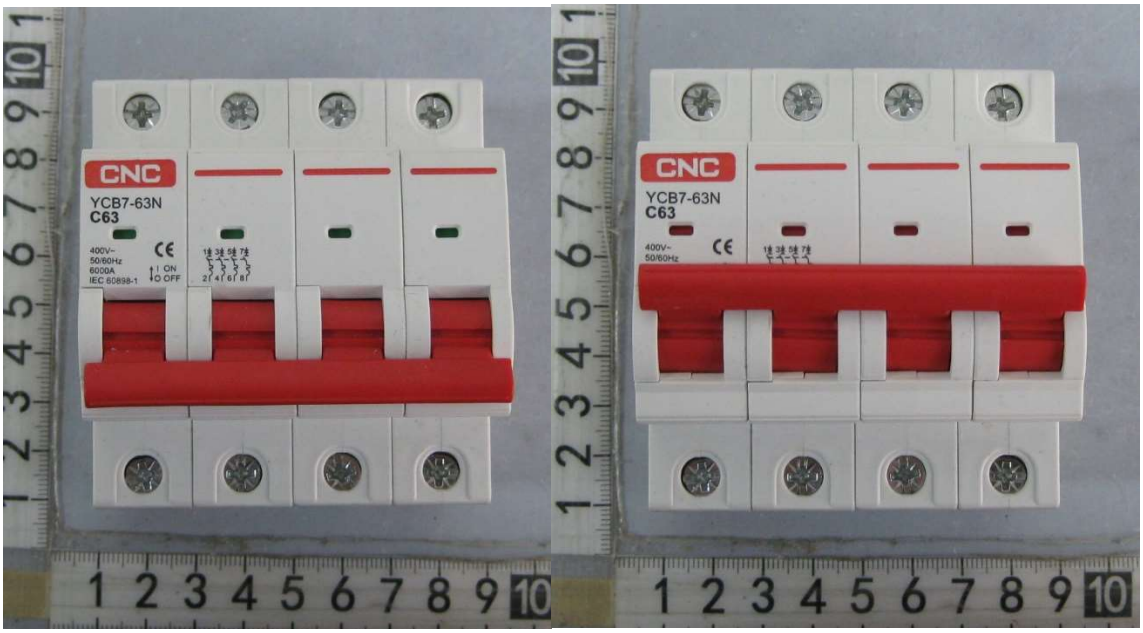
Bottom View

Inside View

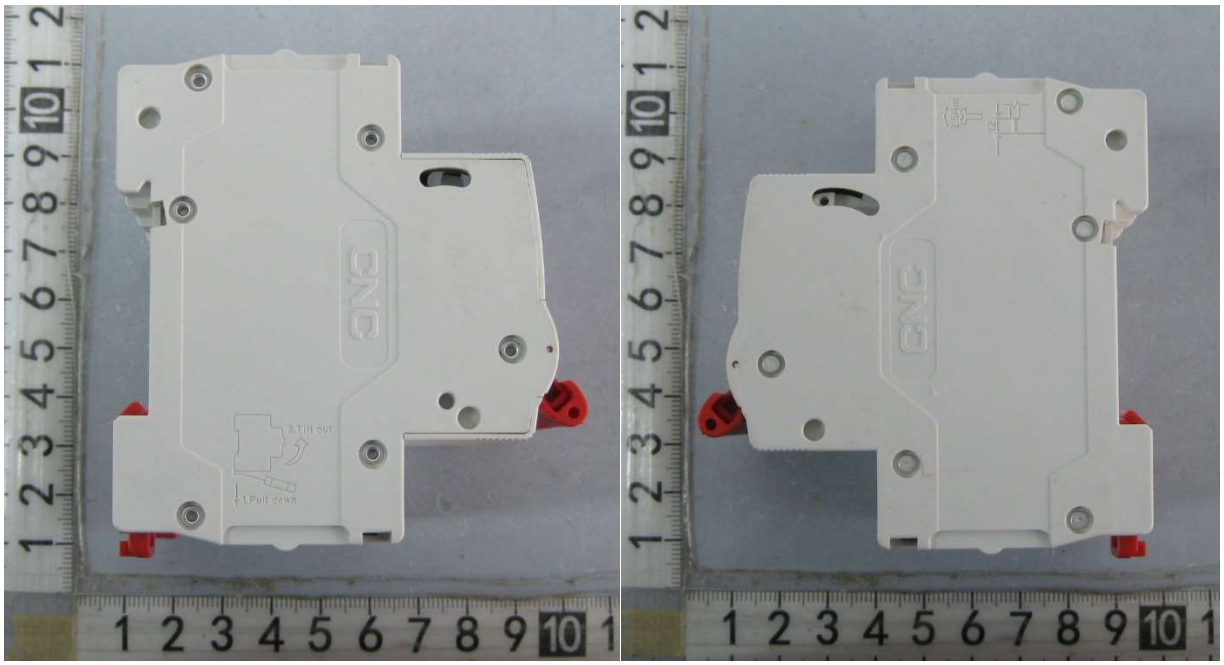


4P;C63

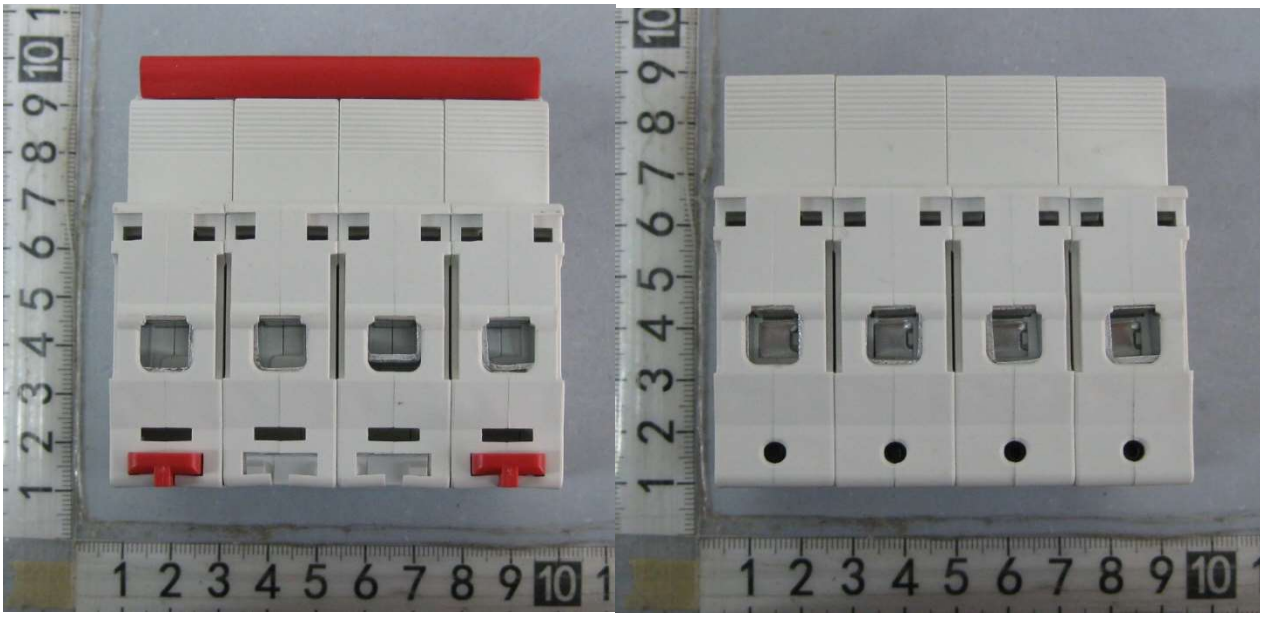
Over View



Side View



Side View



Bottom View

Inside View