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. .....:	1W170276-B1
Date of issue .....:	02.11.2017
Total number of pages.....	157 pages
Applicant's name .....:	**WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD.**
Address .....:	NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA
Test specification:	
Standard.....:	IEC 60898-1 (Second Edition)
Test procedure .....:	CB Scheme
Non-standard test method .....:	N/A
Test Report Form No. .....:	IEC60898_1D
Test Report Form(s) Originator ....:	DEKRA Certification B.V.
Master TRF.....:	Dated 2015-09

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.
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Test item description .....:	**Circuit Breaker for overcurrent protection**
Trade Mark .....:	TEXENERGO
Manufacturer.....:	WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD.
Model/Type reference .....:	HEA2
Ratings .....:	Ue = 230/400V ~ (1P), 400V ~ (2P/3P/4P); B/C-type; Icn=Ics=3kA; In=1A,2A,4A,6A,10A,16A,20A,25A,32A,40A,50A,63A;

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	CB Testing Laboratory:	The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)	
Testing location/ address.....:		No 125 Miaohouwang Road Binjiang District Hangzhou, Zhejiang CHINA	
☐	Associated CB Testing Laboratory:		
Testing location/ address.....:			
Tested by (name, function, signature).....:		Yuan Kefeng	Yuan Kefeng
Approved by (name, function, signature)...:		Du Liang	Du Liang
☐	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 1: Measuring equipment list (ZTME) – 2 pages
Attachment 2: Photo documentation – 9 pages

Summary of testing:

The type HEA2 is family circuit breaker of the same fundamental design except terminal. According to table C.3 of Annex C, following ratings products were subject relevant test accordingly.

Sample allocation and test items according to IEC 60898-1 and EN 60898-1

Test sample Rating				Test sequence									
Pole	Curve	In [A]	Class	A1	A2	B	C1	C2	D0+D1	D0	E1[c]	E2	E3
1P	C	63	-	1	3	3	3	3	3	-	6	-	-
1P	C	50	-	-	-	-	-	-	-	1	-	-	-
1P	C	40	-	-	-	-	-	-	-	1	-	-	-
1P	C	32	-	-	-	-	-	-	-	1	-	-	-
1P	C	25	-	-	-	-	-	-	-	1	-	-	-
1P	C	20	-	-	-	-	-	-	-	1	-	-	-
1P	C	16	-	-	-	-	-	-	-	1	-	-	-
1P	C	10	-	-	-	-	-	-	-	1	-	-	-
1P	C	6	-	-	-	-	-	-	-	1	-	-	-
1P	C	4	-	-	-	-	-	-	-	1	-	-	-
1P	C	2	-	-	-	-	-	-	-	1	-	-	-
1P	C	1	-	-	-	-	-	-	-	1	6	-	-
1P	B	63	-	-	-	3[b]	-	-	-	1[a]	-	-	-
1P	B	50	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	40	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	32	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	25	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	20	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	16	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	10	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	6	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	4	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	2	-	-	-	-	-	-	-	1[a]	-	-	-
1P	B	1	-	-	-	-	-	-	-	1[a]	-	-	-
2P	C	63	-	-	3	-	-	2	-	-	3	-	-
2P	C	1	-	-	-	-	-	-	-	-	3	-	-
4P	C	63	-	1	3	3	3	1	3	-	3	-	-
4P	C	1	-	-	-	-	-	-	-	-	3	-	-
4P	B	63	-	-	-	3[b]	-	-	-	-	-	-	-

Note:

C-type circuit breaker type-tested first
B-type circuit breaker for sequences D0[a] + B[b]
a stand for only the tests of 9.10.3 in test sequence D0
b stand for only the tests of 9.8 in test sequence B
c stand for the tests of test sequence E1 are under Ics=4kA which is claimed by Applicant.

Tests performed (name of test and test clause):

Testing location:

The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)

EN 60898-1 Common modifications **Test Sequence A-D** page 127	**Testing location:** **The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)**
Summary of compliance with National Differences (List of countries addressed): **N/A** ☒ **The product fulfils the requirements of EN 60898-1: 2003+A1+A11+A12+A13.**	

Copy of marking plate

With sample of C63, 1P

With sample of C1, 1P

With sample of B40, 2P

With sample of C63, 4P

Classification of installation and use.....:	**Circuit Breaker for overcurrent protection**
Supply Connection.....:	**not associated with the mechanical mounting**
.....:	
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 .....:	2017-02-27
Date (s) of performance of tests.....:	2017-06-19～2017-08-20

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.
The basic part of this test report covers the evaluation of the IEC requirements.
Annex 1 of this test report covers the evaluation of the CENELEC common modifications.

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).....:	**WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD.**/ NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA

General product information:

The family products HEA2 are series product, according to Annex C in IEC / EN 60898-1.

Ratings:

Rated voltage 1P:	Un = 230 / 400 V AC
Rated voltage 2P / 3P / 4P:	Un = 400 V AC
Rated current In:	1A, 2A, 4A, 6 A, 10 A, 16 A, 20 A, 25 A, 32 A, 40 A, 50 A, 63 A
Instantaneous characteristic:	B-type; C-type
Short-circuit Capacity:	Icn=Ics=3 kA

Test item particulars.....	
Type of circuit-breaker ..... :	Circuit Breaker for overcurrent protection
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
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 ..... :	
Value of rated operational voltage (Ue) ..... :	☐ 120 V ☐ 230 V ☐ 240 V ☐ 120/240 V ☒ 230/400 V ☒ 400 V ☐ 240/415 V ☐ 415 V
Value of rated current (In) ..... :	1-63 A
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 kA ☐ 6 kA ☐ 10 kA ☐ 15 kA ☐ 20 kA ☐ 25 kA
Rated impulse withstand voltage (Uimp)	☐ 2,5 kV ☒ 4 kV ☐ declared ___kV

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „A“ 4 SAMPLE C63; 1POLE	A_1	
6	**MARKING AND OTHER INFORMATION**		
	Circuit-breaker marked with:		--
	a) Manufacturer’s name or trade mark.....:	Trademark: TEXENERGO	P
	b) Type designation, catalogue number or other serial number.....:	HEA2 C63	P
	c) Rated voltage (V).....:	230 / 400 V	P
	d) Rated current without symbol "A", preceded by the symbol of instantaneous tripping.....:	63 A	P
	e) Rated frequency (Hz) .....:	50/60 Hz	P
	f) Rated short circuit capacity (A).....:	3000 in rectangle	P
	g) Wiring diagram	See copy of marking plate	P
	h) Ambient air temperature, if different from 30°C		P
	i) Degree of protection, if different from IP20		P
	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	4,0 kV	P
	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		N/A
	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		N/A
	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		N/A
	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	1; 2; I; O	P
	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 -		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	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		N/A
	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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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**		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
	Compliance for item 1 in Table 4 is checked by measurement and by the test of 9.7.5.4.1 and 9.7.5.4.2. The test is carried out with samples not submitted to the humidity treatment described in 9.7.1.		P
	The clearances of items 2 and 4 (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.		P
	In this case, after the humidity treatment in 9.7.1, compliance for item 2 and 4 and arrangements of 9.7.2 items b), c), d) and e) is checked:		P
	-Tests according to 9.7.2 to 9.7.4 as applicable		P
	-Test according to 9.7.5.2 with test voltages acc. Table 13 with test arrangements of 9.7.2 items b), c), d), e)		N/A
	If measurement does not show any reduced clearance, test 9.7.5.2 is not applied		P
	Compliance for item 3, checked by measurement		P
	The insulating materials are classified into Material Groups on the basis of their comparative tracking index (CTI) acc. to IEC 60664-1		P
	Clearances [mm] U_{imp}		--
	4 kV (see table 4) 2,5 kV (see table 4)	☒ ☐	--
	Minimum clearances (see table 4)		
		minimum clearances4,0 [mm]	--
	1.between live parts (of the main circuits) which are separated when the CB is in off position.....:	5,94 mm	P
	2.between live parts of different polarity.....:	Single pole	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	3.between circuits supplied from different sources, one of which being PELV or SELV .....:	no such part	N/A
	4. between live parts and		P
	- accessible surfaces of operating means.....:	23,52 mm	P
	- screws or other means for fixing covers.....:		N/A
	- surface on which the base is mounted.....:	23,26 mm to DIN rail	P
	- screws or other means for fixing the circuit breaker .....:		N/A
	- metal covers or boxes .....:		N/A
	- other accessible metal parts .....:	23,52	P
	- metal frames supporting the base (flush-type)..:		N/A
	Minimum creepage distances (see table 4)		
	Material group	☐ III_b ☒ III_a ☐ II ☐ I	--
		minimum creepage distances 4,0[mm]	--
	1.between live parts (of the main circuits) which are separated when the CB is in off position.....:	9,78 mm	P
	2.between live parts of different polarity.....:	Single pole	N/A
	3.between circuits supplied from different sources, one of which being PELV or SELV .....:	no such part	N/A
	4. between live parts and		P
	- accessible surfaces of operating means.....:	34,68 mm	P
	- screws or other means for fixing covers.....:		N/A
	- surface on which the base is mounted.....:	23,62 mm to DIN rail	P
	- screws or other means for fixing the circuit breaker .....:		N/A
	- metal covers or boxes .....:		N/A
	- other accessible metal parts .....:	34,68 mm	P
	- metal frames supporting the base (flush-type)..:		N/A
8.1.4	**Screws, current-carrying parts and connections**		--
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use		P
	Screws for mounting of the CB not of the thread-cutting type		N/A
	Test according to cl. 9.4:		P
	- 10 times (screw Ø / torque Nm)	Ø___mm___Nm (see table 11) Ø___mm___Nm	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 5 times (screw Ø / torque Nm)	Ø_4,86__mm_2,0__Nm (see table 11) Ø___mm___Nm	P
	Plug in connections tested by plugging in and pulling out five times		N/A
	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		N/A
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
	- alloy 58% copper for worked cold parts	For contact	P
	- alloy 50% copper for other parts		N/A
	- other metal	Zn plated Steel for screw	P
	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).		N/A
	The requirements of this subclause do not apply to contacts, magnetic circuits, heater elements, bimetals, shunts, parts of electronic devices or to screws, nuts, washers, clamping plates, similar parts of terminals and parts of the test circuit		P
8.1.5	**Terminals for external conductors**		--
	Compliance is checked by inspection and by the tests as relevant for the type of connection:		--
	by tests of clause 9.5 for screw-type terminals		P
	by specific tests for plug-in or bolt-on CBs included in the standard		N/A
	by the tests of Annexes J, K		P
8.1.5.1	Terminals ensure the necessary contact pressure		P
9.5	Torque test:		
	- torque (Nm); diameter (mm).....:	2,0Nm, Ø4,86mm	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- torque (Nm); diameter (mm).....:		--
	- torque (Nm); diameter (mm).....:		--
	- max. cross-sectional area (mm²).....:	25mm²	--
9.5.2	Pull test:		P
	Terminal shall be suitable for all types of conductors: rigid (solid or stranded) and flexible, unless otherwise specified by the manufacturer.		--
	Min. cross-section solid / stranded / flexible (mm²).....:	1mm²	--
	Max. cross-section solid / stranded / flexible (mm²).....:	25mm²	--
	Torque $^{2}/_{3}$ (Nm) .....:	1,33Nm	--
	Pull for 1 min solid / stranded / flexible (N).....:	50/100N	P
	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 damage		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

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Clause	Requirement + Test	Result - Remark	Verdict

	Rated current (A) / Range of nominal cross sections to be clamped* (mm^2): Rigid (solid or stranded) conductors / Flexible conductors ≤ 13: 1 to 2,5 / 1 to 2,5 > 13 ≤ 16: 1 to 4 / 1 to 4 > 16 ≤ 25: 1,5 to 6 / 1,5 to 6 > 25 ≤ 32: 2,5 to 10 / 2,5 to 6 > 32 ≤ 50: 4 to 16 / 4 to 10 > 50 ≤ 80: 10 to 25 / 10 to 16 > 80 ≤ 100: 16 to 35 / 16 to 25 > 100 ≤ 125: 24 to 50 / 25 to 35	1 to 25 mm^2	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 mm^2 up to 6 mm^2 be designed to clamp solid conductors only.		N/A
	- 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 of tapping screw 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 holding in position of which does not depend solely on their plug-in connection(s), shall be reliable and have adequate stability		N/A
8.1.7.2	Plug-in type circuit-breakers, the holding in position 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 holding in position 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
8.2	**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		P
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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)**		N/A
	Internal parts only	See above	N/A
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		P
8.10	**Resistance to heat**		P
	CB sufficiently resistant to heat		P
9.14	**Test of resistance to heat**		P
9.14.1	Test:		P
	- without removable covers ..... 1 h (100 ± 2) °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	Impression: 1,06mm for enclosure	P

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
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 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	**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
	external parts retaining current-carrying parts and parts of the protective circuit in position ..... (960 ± 15)°C	Enclosure	P
	all other external parts ..... (650 ± 10)°C	Handle	P
	No visible flames, no sustained glowing, or		N/A
	flames and glowing extinguish within 30 s after removal .....:	1s	P
	No ignition of tissue paper or scorching of the pinewood board		P

	TESTS „A“ 4 SAMPLE C63; 4POLE	**A_1**	
6	**MARKING AND OTHER INFORMATION**		
	Circuit-breaker marked with:		--
	a) Manufacturer’s name or trade mark.....:	Trademark: TEXENERGO	P

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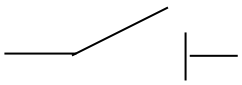
Clause	Requirement + Test	Result - Remark	Verdict
	b) Type designation, catalogue number or other serial number.....:	HEA2 C63	P
	c) Rated voltage (V).....:	400 V	P
	d) Rated current without symbol "A", preceded by the symbol of instantaneous tripping.....:	63 A	P
	e) Rated frequency (Hz) .....:	50 Hz	P
	f) Rated short circuit capacity (A).....:	3000 in rectangle	P
	g) Wiring diagram	See copy of marking plate	P
	h) Ambient air temperature, if different from 30°C		P
	i) Degree of protection, if different from IP20		P
	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		P
	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		N/A
	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		N/A
	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
	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 -		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

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Clause	Requirement + Test	Result - Remark	Verdict
	For CB with multiple current ratings, the maximum value is marked, the adjusted value indicated without ambiguity		N/A
	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		N/A
	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
	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		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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**		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
	Compliance for item 1 in Table 4 is checked by measurement and by the test of 9.7.5.4.1 and 9.7.5.4.2. The test is carried out with samples not submitted to the humidity treatment described in 9.7.1.		P
	The clearances of items 2 and 4 (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.		P
	In this case, after the humidity treatment in 9.7.1, compliance for item 2 and 4 and arrangements of 9.7.2 items b), c), d) and e) is checked:		P
	-Tests according to 9.7.2 to 9.7.4 as applicable		P
	-Test according to 9.7.5.2 with test voltages acc. Table 13 with test arrangements of 9.7.2 items b), c), d), e)		N/A
	If measurement does not show any reduced clearance, test 9.7.5.2 is not applied		P
	Compliance for item 3, checked by measurement		P
	The insulating materials are classified into Material Groups on the basis of their comparative tracking index (CTI) acc. to IEC 60664-1		P
	Clearances [mm] U_{imp}		--
	4 kV (see table 4) 2,5 kV (see table 4)	☒ ☐	--
	Minimum clearances (see table 4)		
		minimum clearances4,0 [mm]	--
	1.between live parts (of the main circuits) which are separated when the CB is in off position.....:	5,94 mm	P
	2.between live parts of different polarity.....:	8,62 mm	P
	3.between circuits supplied from different sources, one of which being PELV or SELV .....:	no such part	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	4. between live parts and		P
	- accessible surfaces of operating means.....:	23,52 mm	P
	- screws or other means for fixing covers.....:		N/A
	- surface on which the base is mounted.....:	23,26 mm to DIN rail	P
	- screws or other means for fixing the circuit breaker .....:		N/A
	- metal covers or boxes .....:		N/A
	- other accessible metal parts .....:	23,52	P
	- metal frames supporting the base (flush-type)..:		N/A
	Minimum creepage distances (see table 4)		
	Material group	☐ III_b ☒ III_a ☐ II ☐ I	--
		minimum creepage distances 4,0[mm]	--
	1.between live parts (of the main circuits) which are separated when the CB is in off position.....:	9,78 mm	P
	2.between live parts of different polarity.....:	10,82 mm	P
	3.between circuits supplied from different sources, one of which being PELV or SELV .....:	no such part	N/A
	4. between live parts and		P
	- accessible surfaces of operating means.....:	34,68 mm	P
	- screws or other means for fixing covers.....:		N/A
	- surface on which the base is mounted.....:	23,62 mm to DIN rail	P
	- screws or other means for fixing the circuit breaker .....:		N/A
	- metal covers or boxes .....:		N/A
	- other accessible metal parts .....:	34,68 mm	P
	- metal frames supporting the base (flush-type)..:		N/A
8.1.4	**Screws, current-carrying parts and connections**		--
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use		P
	Screws for mounting of the CB not of the thread-cutting type		N/A
	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)	Ø_4,86__mm_2,0__Nm (see table 11) Ø___mm___Nm	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Plug in connections tested by plugging in and pulling out five times		N/A
	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		N/A
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
	- alloy 58% copper for worked cold parts	For contact	P
	- alloy 50% copper for other parts		N/A
	- other metal	Zn plated Steel for screw	P
	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).		N/A
	The requirements of this subclause do not apply to contacts, magnetic circuits, heater elements, bimetals, shunts, parts of electronic devices or to screws, nuts, washers, clamping plates, similar parts of terminals and parts of the test circuit		P
8.1.5	**Terminals for external conductors**		--
	Compliance is checked by inspection and by the tests as relevant for the type of connection:		--
	by tests of clause 9.5 for screw-type terminals		P
	by specific tests for plug-in or bolt-on CBs included in the standard		N/A
	by the tests of Annexes J, K		P
8.1.5.1	Terminals ensure the necessary contact pressure		P
9.5	Torque test:		P
	- torque (Nm); diameter (mm).....:	2,0Nm, Ø4,86 mm	--
	- torque (Nm); diameter (mm).....:		--
	- torque (Nm); diameter (mm).....:		--

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Clause	Requirement + Test	Result - Remark	Verdict
	- max. cross-sectional area (mm²).....:	25mm²	--
9.5.2	Pull test:		P
	Terminal shall be suitable for all types of conductors: rigid (solid or stranded) and flexible, unless otherwise specified by the manufacturer.		--
	Min. cross-section solid / stranded / flexible (mm²).....:	1mm²	--
	Max. cross-section solid / stranded / flexible (mm²).....:	25mm²	--
	Torque 2/3 (Nm) .....:	1,33Nm	--
	Pull for 1 min solid / stranded / flexible (N).....:	50/100N	P
	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 damage		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

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A) / Range of nominal cross sections to be clamped* (mm^2): Rigid (solid or stranded) conductors / Flexible conductors ≤ 13: 1 to 2,5 / 1 to 2,5 > 13 ≤ 16: 1 to 4 / 1 to 4 > 16 ≤ 25: 1,5 to 6 / 1,5 to 6 > 25 ≤ 32: 2,5 to 10 / 2,5 to 6 > 32 ≤ 50: 4 to 16 / 4 to 10 > 50 ≤ 80: 10 to 25 / 10 to 16 > 80 ≤ 100: 16 to 35 / 16 to 25 > 100 ≤ 125: 24 to 50 / 25 to 35	1 to 25 mm^2	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 mm^2 up to 6 mm^2 be designed to clamp solid conductors only.		N/A
	- 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 of tapping screw 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 holding in position of which does not depend solely on their plug-in connection(s), shall be reliable and have adequate stability		N/A
8.1.7.2	Plug-in type circuit-breakers, the holding in position 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 holding in position 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
8.2	**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		P
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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)**		N/A
	Internal parts only	See above	N/A
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		P
8.10	**Resistance to heat**		P
	CB sufficiently resistant to heat		P
9.14	**Test of resistance to heat**		P
9.14.1	Test:		P
	- without removable covers ..... 1 h (100 ± 2) °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	Impression: 1,06mm for enclosure	P

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
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 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	**A_{2-1} A_{2-2} A_{2-3}**	P
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
	external parts retaining current-carrying parts and parts of the protective circuit in position ..... (960 ± 15)°C	Enclosure	P
	all other external parts ..... (650 ± 10)°C	Handle	P
	No visible flames, no sustained glowing, or		N/A
	flames and glowing extinguish within 30 s after removal .....:		P
	No ignition of tissue paper or scorching of the pinewood board		P

	TESTS „B“ 3 samples C63; 1POLE	**B_1 B_2 B_3**	P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	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 capabilityd		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.	4,0 kV	P
9.7	**Test of dielectric properties and isolating capability**		P
9.7.5.4	Verification of resistance of the insulation of open contact and basic insulation against an impulse voltage in normal conditions		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]:	4,0kV	--
	sea level of test laboratory [m]:	0 m	--
	test voltage (acc. Table 15) [kV]:	6,2kV	--
9.7.5.4.2	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
9.7.5.4.3	CB in closed position		P
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		P

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Clause	Requirement + Test	Result - Remark	Verdict
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the CB		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.		N/A
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 = 92…94 % T = 21,5…22,5 °C	P
9.7.1.3	Test procedure.		P
	The sample is kept in the cabinet for 48 h.		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
9.7.2	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, consecutively as follows:	[MΩ] [MΩ] [MΩ]	P
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position ≥ 2 MΩ	550 MΩ	P
	b) in off-position, between each pole in turn and the others connected together ≥ 2 MΩ		N/A
	c) in on-position, between all poles connected together and the frame ≥ 5 MΩ	550 MΩ	P
	d) between metal parts of mechanism and the frame ≥ 5 MΩ		N/A
	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material ≥ 5 MΩ		N/A
9.7.3	Dielectric strength of the main circuit		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	a) 2000 V		P
	b) 2000 V		N/A
	c) 2000 V		P
	d) 2000 V		N/A
	e) 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 V DC after 1 min:		--
	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
	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
9.7.5.2	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

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Clause	Requirement + Test	Result - Remark	Verdict
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2µs, and a time to half-value of 50µs		N/A
	The shape of the impulses is adjusted with the CB under test connected to the impulse generator.		N/A
	test performed with:		--
	-surge impedance of the test apparatus ≤500Ω and surge protective devices disconnected before testing or		N/A
	-hybrid generator with an surge impedance of 2 Ω and surge protective devices not disconnected before testing		N/A
	rated impulse withstand voltage [kV]:	kV	--
	see level of test laboratory [m]:	m	--
	test voltage (acc. Table 14) [kV]:	kV	--
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		N/A
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the CB		N/A
	A third series of tests is made applying the impulse voltage between (and not tested during the two first sequences described here above):		--
	b) between each pole and the others connected together		N/A
	c) between all poles connected together and the frame		N/A
	d) between metal parts of the mechanism and the frame		N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material		N/A
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.		N/A
	no disruptive discharges during the test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:	sect. ___16___ mm²			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 = _63___A			P
	Ambient air temperature.....:	Tamb= __23,5____°C			P
	Parts .....Temperature rise [K]	[K]	[K]	[K]	P
	L1	46,4	47,3	46,8	P
	L2	42,4	45,2	43,3	
	Terminals for external connections ..... 60 K	47,3			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	10,2	10,9	11,2	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	15,1	14,7	15,9	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				P
	Test current: I_N = 63 A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 13 W	W	W	W	P
	L1 L2	5,07 -	5,63 -	5,46 -	P
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. __16__ mm²	I_N = ___63____A			P
	During the test no tripping during the last period, temperature rise shall be measured				P
	Ambient air temperature.....:	23,0~23,3°C			P

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Clause	Requirement + Test	Result - Remark	Verdict

	Parts .....Temperature rise [K]	46,2[K]	45,9[K]	46,5[K]	P
	Terminals for external connections				P
	The temperature rise does not exceed the value measured during the temperature rise test (sub-clause 9.8) by more than 15 K				P
	Test current 1,45 I_N =91,35A	91,4A			P
	- Tripping within	[s]	[s]	[s]	P
	- 1h (≤ 63 A)	1min10s	57s	1min04s	P
	- 2h (> 63 A)				N/A

	TESTS „B“ 3 samples B63; 1POLE	**B_1**	**B_2**	**B_3**	P
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:	sect. ___16___ mm²			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 = 63 A			P
	Ambient air temperature.....:	Tamb= 23,3°C			P
	Parts .....Temperature rise [K]	[K]	[K]	[K]	P
	L1	47,9	48,2	43,6	P
	L2	45,2	43,7	45,7	
	Terminals for external connections ..... 60 K	48,2			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	10,8	11,2	12,2	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	15,4	16,2	15,7	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				P
	Test current: I_N =63 A (reach the steady state value)				P
	Loaded one pole after the other				P

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Clause	Requirement + Test	Result - Remark	Verdict

	Max. power loss : _____13___ W	W	W	W	P
	L1 L2	5,80 -	5,25 -	5,99 -	P
	TESTS „B“ 3 samples C63; 4POLE	**B_1**	**B_2**	**B_3**	P
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 capabilityd				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.	4,0 kV			P
9.7	**Test of dielectric properties and isolating capability**				P
9.7.5.4	Verification of resistance of the insulation of open contact and basic insulation against an impulse voltage in normal conditions				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]:	4,0kV			--
	sea level of test laboratory [m]:	0 m			--
	test voltage (acc. Table 15) [kV]:	6,2kV			--
9.7.5.4.2	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
9.7.5.4.3	CB in closed position				P

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Clause	Requirement + Test	Result - Remark	Verdict
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		P
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the CB		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.		N/A
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 = 92…94 % T = 21,5…22,3 °C	P
9.7.1.3	Test procedure.		P
	The sample is kept in the cabinet for 48 h.		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
9.7.2	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, consecutively as follows:	[MΩ] [MΩ] [MΩ]	P
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position ≥ 2 MΩ	550 MΩ	P
	b) in off-position, between each pole in turn and the others connected together ≥ 2 MΩ		N/A
	c) in on-position, between all poles connected together and the frame ≥ 5 MΩ	550 MΩ	P
	d) between metal parts of mechanism and the frame ≥ 5 MΩ		N/A

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	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material ≥ 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
	a) 2000 V		P
	b) 2000 V		P
	c) 2000 V		P
	d) 2000 V		N/A
	e) 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 V DC after 1 min:		--
	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
	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
9.7.5.2	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
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2µs, and a time to half-value of 50µs		N/A
	The shape of the impulses is adjusted with the CB under test connected to the impulse generator.		N/A
	test performed with:		--
	-surge impedance of the test apparatus ≤500Ω and surge protective devices disconnected before testing or		N/A
	-hybrid generator with an surge impedance of 2 Ω and surge protective devices not disconnected before testing		N/A
	rated impulse withstand voltage [kV]:	kV	--
	see level of test laboratory [m]:	m	--
	test voltage (acc. Table 14) [kV]:	kV	--
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		N/A
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the CB		N/A
	A third series of tests is made applying the impulse voltage between (and not tested during the two first sequences described here above):		--
	b) between each pole and the others connected together		N/A
	c) between all poles connected together and the frame		N/A
	d) between metal parts of the mechanism and the frame		N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material		N/A

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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.				N/A
	no disruptive discharges during the test				N/A
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:	sect. ___16___ mm²			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 = _63___A			P
	Ambient air temperature.....:	Tamb= __22,7____°C			P
	Parts .....Temperature rise [K]	[K]	[K]	[K]	P
	L1	45,8	46,6	47,2	
	L2	46,2	45,3	45,3	
	L3	45,1	46,2	46,7	
	L4	43,5	45,9	45,6	
	L5	43,2	43,7	43,7	
	L6	42,7	42,8	44,2	
	L7	41,6	42,7	43,6	
	L8	40,9	43,3	42,5	
	Terminals for external connections ..... 60 K	47,2			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	9,3	10,2	9,5	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	14,6	15,7	15,2	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				P

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Clause	Requirement + Test	Result - Remark	Verdict

	Test current: I_N = 63 A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 13 W	W	W	W	P
	L1 L2 L3 L4	5,49 5,87 5,29 5,05	5,83 5,88 5,49 5,29	5,59 5,27 5,36 5,30	P
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. __16__ mm²	I_N = ___63____A			P
	During the test no tripping during the last period, temperature rise shall be measured				P
	Ambient air temperature.....:	23,0~23,3°C			P
	Parts .....Temperature rise [K]	46,3[K]	47,7[K]	46,7[K]	P
	Terminals for external connections				P
	The temperature rise does not exceed the value measured during the temperature rise test (sub-clause 9.8) by more than 15 K				P
	Test current 1,45 I_N =91,35A	91,4A			P
	- Tripping within	[s]	[s]	[s]	P
	- 1h (≤ 63 A)	1min02s	53s	1min09s	P
	- 2h (> 63 A)				N/A

	TESTS „B“ 3 samples B63; 4POLE	**B_1**	**B_2**	**B_3**	P
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:	sect. ___16___ mm²			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 = _63___A			P
	Ambient air temperature.....:	Tamb= __22,5__°C			P
	Parts .....Temperature rise [K]	[K]	[K]	[K]	P
	L1	47,1	49,3	48,2	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L2	43,5	48,2	48,3	
	L3	46,3	47,6	47,6	
	L4(N)	45,2	48,2	47,9	
	L5	43,3	46,1	45,2	
	L6	44,6	45,3	45,4	
	L7	45,1	44,9	46,2	
	L8(N)	43,2	42,5	47,1	
	Terminals for external connections ..... 60 K	49,3			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	11,2	9,16	11,3	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	15,2	14,2	15,1	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				P
	Test current: I_N = 63 A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 13 W	W	W	W	P
	L1	5,63	5,56	5,69	P
	L2	5,80	5,66	5,49	
	L3	5,49	5,44	5,43	
	L4	5,87	5,17	5,36	

	TESTS „C“ 3 +3 samples C63, 1POLE				**P**
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

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Clause	Requirement + Test	Result - Remark	Verdict

	Test: Test Voltage 230 V (rated voltage) Test Current 63 A (rated current) Power factor 0,87 (0,85-0,9) Par. resistor _____ (Ω) Cross sect. area 16mm²	Obtained 233 V 63,6 A 0,87			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	In = 63 A			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 161 A	A			N/A
	Opening time not less 1 s or more than	[s]	[s]	[s]	P
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	27	36	29	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
9.12.11.2.1	Test at reduced short-circuit currents: Fig. 3				P
	Test current:	Obtained			--
	- 500 A or 10 In	I test= 643 A			--
	Test voltage 1,05 Un	Un = 245 V			--
	Power factor 0,93-0,98	0,94			--
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

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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	dimension of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value	869	871	872	--
	Sequence: 6 x "O" and 3 x "CO"	[kA²s]	[kA²s]	[kA²s]	--
	Max. I²t ≤ _____kA²s	4,03	3,49	4,07	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.= _240_ V. 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	< 0,01	< 0,01	< 0,01	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
9.12.11.2.2	**Test C_2 : Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems (3 sample)**				P
	Test current:				P

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Clause	Requirement + Test	Result - Remark	Verdict

	- 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	762A			P
	Test voltage 1,05 Un	422V			P
	Power factor 0,93-0,98	0,97			P
9.12.9.1	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" = 50 mm			P
9.12.9.2	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	1,77kA	1,76 kA	1,76 kA	--
	Sequence: "0" + "CO" on each protected pole	[kA2s]	[kA2s]	[kA2s]	--
	Shifted point 30 ° on the other protected pole	C2-1	C2-2	C2-3	--
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4	12,7	8,89	9,04	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 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 240V. The circuit – breaker is in the open position	**C_{2-1}** [mA]	**C_{2-2}** [mA]	**C_{2-3}** [mA]	P
	The leakage current shall not exceed 2 mA L1	< 0,1	< 0,1	< 0,1	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:	1500 V, 1 min, 100 mA			P

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Clause	Requirement + Test	Result - Remark	Verdict

	Test voltage 1500 V (see 8.7.2)		P
	a)		P
	b)		N/A
	c)		P
	d)		N/A
	e) 2000 V		N/A

	TESTS „C“ 2 samples C63, 2POLE				**P**
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 _400_ V (rated voltage) Test Current __63_ A (rated current) Power factor __0,86_ (0,85-0,9) Par. resistor _____ (Ω) Cross sect. area _16_ mm²	Obtained 404 V 63,6 A 0,88			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	In = 63 A			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				N/A
	Moreover test current..... 2,55 I_N _161__ A	A			N/A
	Opening time not less 1 s or more than	[s]	[s]	[s]	P

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Clause	Requirement + Test	Result - Remark			Verdict
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	42	35	40	P
	Dielectric strength reduced to 1500 V	1500 V; 1 min; 100 mA			P
9.12.11.2	**Test at reduced short-circuit currents**				P
9.12.11.2.1	Test on all circuit-breakers				P
9.12.11.2.1	Test at reduced short-circuit currents: Fig. 3				P
	Test current:	Obtained			--
	- 500 A or 10 In	I test= ___643_____A			--
	Test voltage 1,05 Un	Un = __245_____V (phase to earth)			--
	Power factor 0,93-0,98	__0,94_____			--
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	867A	--	--	--
	Sequence: 6 x "O" and 3 x "CO"	[kA²s]	[kA²s]	[kA²s]	--
	Max. I²t ≤ _____kA²s	5,67	--	--	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.= _440_ V. 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	< 0,01	< 0,01	< 0,01	P
	L2	< 0,01	< 0,01	< 0,01	P
	L3	< 0,01	< 0,01	< 0,01	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L4(N)	< 0,01	< 0,01	< 0,01	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
9.12.11.2.2	**Test C_2 : Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems (2 sample) C63, 2POLE**				P
	Test current:	C63, 2POLE			P
	- 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	762A			P
	Test voltage 1,05 Un	422V			P
	Power factor 0,93-0,98	0,97			P
9.12.9.1	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" = 50 mm			P
9.12.9.2	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	1,77 kA	1,78 kA		--
	Sequence: "0" + "CO" on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	--
	Shifted point 30 ° on the other protected pole	C2-1	C2-2	C2-3	--
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4	12,1	11,5		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

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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 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 440 V. The circuit – breaker is in the open position	**C_{2-1}** [mA]	**C_{2-2}** [mA]	**C_{2-3}** [mA]	P
	The leakage current shall not exceed 2 mA L1	< 0,1	< 0,1		P
	 L2	< 0,1	< 0,1		P
	 L3				N/A
	L4(N)				N/A
	Electric strength test:	1500 V, 1 min, 100 mA			P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				N/A
	d)				N/A
	e) 2000 V				N/A

	TESTS „C“ 3 +1 samples C63, 4POLE				**P**
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 _400_V (rated voltage) Test Current __63_A (rated current) Power factor __0,86_ (0,85-0,9) Par. resistor _____ (Ω) Cross sect. area _16_mm²	Obtained 404 V 63,6 A 0,88			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

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Clause	Requirement + Test	Result - Remark			Verdict
	- I_N > 32 A: 2 s on - 28 s off	In = 63 A			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				N/A
	Moreover test current..... 2,55 I_N 161 A	A			N/A
	Opening time not less 1 s or more than	[s]	[s]	[s]	P
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	42	35	40	P
	Dielectric strength reduced to 1500 V	1500 V; 1 min; 100 mA			P
9.12.11.2	**Test at reduced short-circuit currents**				P
9.12.11.2.1	Test on all circuit-breakers				P
9.12.11.2.1	Test at reduced short-circuit currents: Fig. 3				P
	Test current:	Obtained			--
	- 500 A or 10 In	I test= 643 A			--
	Test voltage 1,05 Un	Un = 245 V (phase to earth)			--
	Power factor 0,93-0,98	0,94			--
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	859A	864A	865A	--
	Sequence: 6 x "O" and 3 x "CO"	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. I^2t ≤ ____ kA^2s	3,71	7,81	5,96	P
	- 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	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.= _440_ V. 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	< 0,01	< 0,01	< 0,01	P
	L2	< 0,01	< 0,01	< 0,01	P
	L3	< 0,01	< 0,01	< 0,01	P
	L4(N)	< 0,01	< 0,01	< 0,01	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
9.12.11.2.2	**Test C_2 : Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems (1 sample)**				P
	Test current:				P
	- 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	762A			P
	Test voltage 1,05 Un	422V			P
	Power factor 0,93-0,98	0,97			P
9.12.9.1	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

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Clause	Requirement + Test	Result - Remark	Verdict

9.12.9.2	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	1,85 kA			P
	Sequence: "0" + "CO" on each protected pole	[kA2s]	[kA2s]	[kA2 s]	P
	Shifted point 30 ° on the other protected pole	C2-1	C2-2	C2-3	P
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4	16,9			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 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 440V. The circuit – breaker is in the open position	**C_{2-1}** [mA]	**C_{2-2}** [mA]	**C_{2-3}** [mA]	P
	The leakage current shall not exceed 2 mA L1	< 0,1			P
	L2	< 0,1			P
	L3	< 0,1			P
	L4(N)	< 0,1			P
	Electric strength test:	1500 V, 1 min, 100 mA			P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**C63; 1POLE**	P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	63A	--
	Sect. (mm²)	16mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
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	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min51s 2min10s 1min18s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	162A	P
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	12,1 15,7 13,2	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
	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]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	≥ 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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	___315__A	P
	Opening time:	[s] [s] [s]	P
	≥ 0,1 s		P
	Test current 10 I_N (A), starting from cold	___630_____ A	P
	Tripping less than 0,1 s	10,2ms 7,67ms 9,13ms	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	161	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	19,7 13,2 18,8	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]	N/A
	≥ 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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:		N/A
*see Annex 1 acc. EN60898-1	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
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]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =___-5_____°C	P
	Test current 1,13 I_N (A)	____71,2_____A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	_____120____A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min10s 53s 48s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	63A	P
	No tripping within		--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

	Tests „D_1“	**D_{1-1} D_{1-2} D_{1-3}**	P
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

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Clause	Requirement + Test	Result - Remark	Verdict

	- 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
	Prospective current obtained (A)	1,5 kA			--
	Power factor	0,94			--
	Test voltage 1,05 Un	243 V			--
	Test circuit: figure	3/5			--
	T (min)	3 min			--
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			--
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	6 O – 2 CO - O			--
	I_{Peak} (A) max. value	1,77kA	1,76kA	1,67kA	--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ _____kA^2s L1	12,7	8,89	9,04	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

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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.= 240 V. The circuit – breaker is in the open position	**D_{1-1}** [mA]	**D_{1-2}** [mA]	**D_{1-3}** [mA]	--
	The leakage current shall not exceed 2 mA L1	<0,01	<0,01	<0,01	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5 A			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 A			P
		D_{1-1} [min]	**D_{1-2}** [min]	**D_{1-3}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	3min49s	5min20s	5min07s	P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**C63; 4POLE**	P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	63 A	--
	Sect. (mm²)	16 mm²	--
	Instantaneous tripping current	☐ B ☐ C ☒ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	71,2 A	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)	91,4 A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min13s 1min53s 52s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	161 A	P
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	13,6s 16,7s 12,5s	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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 5 I_N (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
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	____314____A	P
	Opening time:	[s] [s] [s]	P
	≥ 0,1 s	2,32 3,11 2,71	P
	Test current 10 I_N (A), starting from cold	632 A	P
	Tripping less than 0,1 s	2,32ms 3,11ms 2,71ms	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	161A	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	9,23s 13,5s 12,7s	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	___A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		P
	Test current 1,1 It (A), (two pole) starting from cold	_____A	N/A
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	___110_____A	P
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)	1min19s 1min07s 1min14s	P
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		P
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =___-5_____°C	P
	Test current 1,13 I_N (A)	____71,2_____A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	_____120____A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	50s 1min02s 45s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	__63_____A	P
	No tripping within		--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

	Tests „D_1“	**D_{1-1} D_{1-2} D_{1-3}**	P
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

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Clause	Requirement + Test	Result - Remark	Verdict

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
	Prospective current obtained (A)	1,58 kA			--
	Power factor	0,96			--
	Test voltage 1,05 Un	425 V			--
	Test circuit: figure	3/5			--
	T (min)	3 min			--
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			--
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	6 O – 3 CO			--
	I_{Peak} (A) max. value	1,68 kA	1,67 kA	1,67 kA	--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ _____kA^2s L1	10,7	10,8	10,8	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

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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.= 440 V. The circuit – breaker is in the open position	**D_{1-1}** [mA]	**D_{1-2}** [mA]	**D_{1-3}** [mA]	--
	The leakage current shall not exceed 2 mA L1	<0,01	<0,01	<0,01	P
	L2	< 0,01	< 0,01	< 0,01	P
	L3	< 0,01	< 0,01	< 0,01	P
	L4(N)	< 0,01	< 0,01	< 0,01	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5 A			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 A			P
		D_{1-1} [min]	**D_{1-2}** [min]	**D_{1-3}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	3min16s	2min11s	3min32s	P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 1 sample	**C50; 1POLE**	P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	50 A	--
	Sect. (mm²)	10 mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 IN (A) starting from cold for:	56,6A	P
	- 1 h (IN ≤ 63 A)		P
	- 2 h (IN > 63 A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	72,6A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min13s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	128 A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	14,7 s	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
	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]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	≥ 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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_251_A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	4,72s	P
	Test current 10 I_N (A), starting from cold	__500_A	P
	Tripping less than 0,1 s	9,12s	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:		P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	___128__A	P
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	16,7s	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	56,6A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	95,0A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	51s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	50A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**C40; 1POLE**	P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	40A	--
	Sect. (mm²)	10mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	45,2A	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)	58,0A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min52s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	102A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	19,2s	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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 5 I_N (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
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_200__A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	2,83s	P
	Test current 10 I_N (A), starting from cold	__400_A	P
	Tripping less than 0,1 s	32,2s	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	____102_A	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		P
	- 120 s (> 32 A)	20,1	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	___A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		P
	Test current 1,1 It (A), (two pole) starting from cold	_____A	--
	Tripping within	[min] [min] [min]	N/A
	- 1h (≤ 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	45,2A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	76,0A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min08s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	40A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

	TESTS „D“ 3 samples C32; 1POLE		P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	32A	--
	Sect. (mm²)	6mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	36,2A	P
	- 1 h (I_N ≤ 63 A)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 2 h (I_N > 63 A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	46,4A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min52s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	81,6A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	19,4s	P
	- 120 s (> 32 A)		N/A
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
	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_160_A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	4,12	P
	Test current 10 I_N (A), starting from cold	__320_A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Tripping less than 0,1 s	32,3s	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	__81,6_A	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	15,2s	P
	- 120 s (> 32 A)		N/A
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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	___A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	36,2A	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 1,9 I_N (A) within 5s	60,8A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	59,1s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	32A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

	TESTS „D“ 3 samples C25; 1POLE		P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	25A	--
	Sect. (mm²)	4mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	28,3A	P
	- 1 h (I_N ≤ 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)	36,3A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min24s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	63,8A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	23,9s	P

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Clause	Requirement + Test	Result - Remark	Verdict
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
	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		N/A
	Test current $5I_N$ (A), starting from cold	_125__A	N/A
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	3,14s	N/A
	Test current 10 I_N (A), starting from cold	__250_A	N/A
	Tripping less than 0,1 s	13,1s	N/A
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	__63,8_A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	19,7s	N/A
	- 120 s (> 32 A)		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	___A	N/A
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	28,3A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	47,5A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min14s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	25,1A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 2h (> 63 A)		N/A

	TESTS „D“ 3 samples	**C20; 1POLE**	P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	20A	--
	Sect. (mm²)	4mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	22,6A	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)	29,1A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min28s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	51,1A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	21,9s	P
	- 120 s (> 32 A)		N/A
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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_101__A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	3,35s	P
	Test current 10 I_N (A), starting from cold	__200_A	P
	Tripping less than 0,1 s	8,92s	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_51,1__A	P
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	18,4s	P
	- 120 s (> 32 A)		N/A
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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	32,2s	N/A
	- 120 s (> 32 A)		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	22,6A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	38,1A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	46s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	20,1A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**C16; 1POLE**	P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	16A	--
	Sect. (mm²)	2,5mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	18,1A	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)	23,2A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	2min9s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	40,8A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	22,4s	P
	- 120 s (> 32 A)		N/A
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
	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]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	≥ 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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_80,2__A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	3,08s	P
	Test current 10 I_N (A), starting from cold	__161_A	P
	Tripping less than 0,1 s	11,5s	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	____40,8_A	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	20,7s	P
	- 120 s (> 32 A)		N/A
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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		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]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	18,1A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	30,4A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	59s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	16,1A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**C10; 1POLE**	P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	10A	--
	Sect. (mm²)	1,5mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	11,3A	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)	14,5A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min37s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	25,5A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	16,7s	P
	- 120 s (> 32 A)		N/A
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
	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]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	≥ 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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_50,2__A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	2,93s	P
	Test current 10 I_N (A), starting from cold	__100_A	P
	Tripping less than 0,1 s	32,4s	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	__25,5_A	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	13,1s	P
	- 120 s (> 32 A)		N/A
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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	___A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		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]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	11,3A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	19,0A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	41s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	10,1A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**C6; 1POLE**	P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	6A	--
	Sect. (mm²)	1,0mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	6,78A	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)	8,70A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min28s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	15,3A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	15,6s	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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 5 I_N (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
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_30__A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	3,81s	P
	Test current 10 I_N (A), starting from cold	__60_A	P
	Tripping less than 0,1 s	8,37s	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_15,3_A	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	10,9s	P
	- 120 s (> 32 A)		N/A
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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	__A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	6,80A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	11,4A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1 min 13s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	6,02A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

	TESTS „D“ 3 samples C4; 1POLE		P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	4A	--
	Sect. (mm²)	1,0mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	4,52A	P
	- 1 h (I_N ≤ 63 A)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 2 h (I_N > 63 A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	5,81A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min12s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	10,2A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	13,8s	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
	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_20,1__A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	2,55s	P
	Test current 10 I_N (A), starting from cold	__40,1_A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Tripping less than 0,1 s	7,62s	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	____10,2_A	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	12,1s	P
	- 120 s (> 32 A)		N/A
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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	4,52A	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 1,9 I_N (A) within 5s	7,60A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	55s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	4A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

	TESTS „D“ 3 samples C2; 1POLE		P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	2A	--
	Sect. (mm²)	1,0mm²	--
	Instantaneous tripping current	☐ B ☐ C ☒ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	2,26A	P
	- 1 h (I_N ≤ 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)	2,90A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min56s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	5,10A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	16,2s	P
	- 120 s (> 32 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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
	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[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		P
	Test current $5I_N$ (A), starting from cold	_10__A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	3,03s	P
	Test current 10 I_N (A), starting from cold	__20_A	P
	Tripping less than 0,1 s	33,5ms	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	____5,10_A	P
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	13,1s	P
	- 120 s (> 32 A)		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
**see Annex 1 acc. EN60898-1*	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	2,26A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	3,81A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	43s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	2,01A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 2h (> 63 A)		N/A

	TESTS „D“ 3 samples C1; 1POLE		P
8.6	**Automatic operation**		P
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-1} D_{O-2} D_{O-3}**	P
	I_N (A)	1A	--
	Sect. (mm²)	1,0mm²	--
	Instantaneous tripping current	☐ B ☐ C ☒ D	--
9.10.2	Test of time-current characteristic		P
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	1,13A	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)	1,45A	P
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	1min5s	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	2,55A	
	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	12,4s	P
	- 120 s (> 32 A)		N/A
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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	_____A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[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		P
	Test current 5I_N (A), starting from cold	_5,02__A	P
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	2,01s	
	Test current 10 I_N (A), starting from cold	__10_A	P
	Tripping less than 0,1 s	11,5ms	P
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	__2,55_A	P
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)	11,2s	P
	- 120 s (> 32 A)		N/A
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
9.10.2.2 *)	Test current 2,55 IN (A) starting from cold for:	___A	N/A
*see Annex 1 acc. EN60898-1	opening time not less than 1 s or more than	[s] [s] [s]	--
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T =-5°C	P
	Test current 1,13 I_N (A)	1,13A	P
	- Passed for 1h		P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	1,9A	P
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	49s	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature		P
	Test current I_N (A)	1A	P
	No tripping within	T =40°C	--
	- 1h (≤ 63 A)		P
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**B63; 1POLE (1 SAMPLE)**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	63 A	--
	Sect. (mm²)	16 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		P
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		P
*see Annex 1	Test current $3I_N$ (A), starting from cold	189 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*	6 s	P
	Test current 5 I_N (A), starting from cold	316 A	P
	Tripping less than 0,1 s	8,58 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	161 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s		N/A
	- 120 s	16 s	P
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold	_____	N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
**see Annex 1*	Test current 10I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

	TESTS „D“ 3 samples	**B50; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	IN (A)	50 A	--
	Sect. (mm²)	10 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		P
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	General test conditions		P
	For the lower values of the test current the test is made once, at any convenient voltage.		P

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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.		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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		P
*see Annex 1	Test current 3I_N (A), starting from cold	150 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*	4 s	P
	Test current 5 I_N (A), starting from cold	250 A	P
	Tripping less than 0,1 s	9,58 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	128 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s		N/A
	- 120 s	16 s	P
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current 5I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold	_____	N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
*see Annex 1	opening time not less than 1 s or more than	[s] _____ [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
*see Annex 1	Test current 10I_N (A), starting from cold	_____	--
	Opening time:	[s] _____ [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] _____ [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

	TESTS „D“ 3 samples	**B40; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	40 A	--
	Sect. (mm²)	10 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		N/A
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		N/A
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)*	☒ For circuit-breakers of the B – Type		P
**see Annex 1*	Test current 3I_N (A), starting from cold	120 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*	3 s	P
	Test current 5 I_N (A), starting from cold	201 A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Tripping less than 0,1 s	17,5 ms	P
9.10.1.2 *)	Test current 2,55 I_N (A) starting from cold for:	102 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s		N/A
	- 120 s	14 s	P
9.10.2.3 *)	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current 5I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold	_____	N/A
	Tripping less than 0,1 s		N/A
9.10.1.2 *)	Test current 2,55 I_N (A) starting from cold for:	_____	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)	☐ For circuit-breakers of the D – Type		N/A
*see Annex 1	Test current 10I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2 *)	Test current 2,55 I_N (A) starting from cold for:	_____	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „D“ 3 samples	**B32; 1POLE**	P
8.6	**Automatic operation**		P
8.6.1	Standard time-current zone		P
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.	**D_{O-1}**	P
9.10	**Tests: D_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	32 A	--
	Sect. (mm²)	6,0 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		N/A
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		P
*see Annex 1	Test current $3I_N$ (A), starting from cold	96 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	5 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	160 A	P
	Tripping less than 0,1 s	16,1 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	81,6 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	16 s	P
	- 120 s		N/A
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold	_____	N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
**see Annex 1*	Test current 10I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „D“ 3 samples	**B25; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	25 A	--
	Sect. (mm²)	4,0 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		P
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☐ For circuit-breakers of the B – Type		P
*see Annex 1	Test current $3I_N$ (A), starting from cold	75 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	4 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	126 A	P
	Tripping less than 0,1 s	14,3 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	63,8 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	11 s	P
	- 120 s		N/A
9.10.2.3 *)	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 10 I_N (A), starting from cold	_____	N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
**see Annex 1*	Test current 10I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

	TESTS „D“ 3 samples	**B20; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	20 A	--
	Sect. (mm²)	2,5 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		P
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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

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Clause	Requirement + Test	Result - Remark	Verdict
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		P
	The tripping time of the O operation is measured		P
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		N/A
*see Annex 1	Test current 3I_N (A), starting from cold	60 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	5 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	101 A	P
	Tripping less than 0,1 s	10,8 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	51 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	11 s	P
	- 120 s		N/A
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current 5I_N (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold		N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
*see Annex 1	Test current 10I_N (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--

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Clause	Requirement + Test	Result - Remark	Verdict
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

	TESTS „D“ 3 samples	**B16; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	16 A	--
	Sect. (mm²)	2,5 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		P
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		N/A
*see Annex 1	Test current $3I_N$ (A), starting from cold	48 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	4 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	80,8 A	P
	Tripping less than 0,1 s	11,7 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	40,8 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	10 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 120 s		N/A
9.10.2.3 *)	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current 5I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold	_____	N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
*see Annex 1	Test current 10I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „D“ 3 samples	**B10; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	10 A	--
	Sect. (mm²)	1,5 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		P
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		P
*see Annex 1	Test current $3I_N$ (A), starting from cold	30,0 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	5 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	50,2 A	P
	Tripping less than 0,1 s	10,5 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	25,5 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	9 s	P
	- 120 s		N/A
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 10 I_N (A), starting from cold		N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
**see Annex 1*	Test current 10I_N (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

	TESTS „D“ 3 samples	**B6; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	6 A	--
	Sect. (mm²)	1,0 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		N/A
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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

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Clause	Requirement + Test	Result - Remark	Verdict
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		P
	The tripping time of the O operation is measured		P
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		N/A
*see Annex 1	Test current 3I_N (A), starting from cold	18 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	4 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	30,1 A	P
	Tripping less than 0,1 s	10,9 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	15,3 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	12 s	P
	- 120 s		N/A
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current 5I_N (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold		N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
*see Annex 1	Test current 10I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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

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Clause	Requirement + Test	Result - Remark	Verdict
	Tripping less than 0,1 s		N/A
9.10.1.2*)	Test current 2,55 I_N (A) starting from cold for:	_____	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

	TESTS „D“ 3 samples	**B5; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	5 A	--
	Sect. (mm²)	1,0 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		N/A
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		N/A
*see Annex 1	Test current 3I_N (A), starting from cold	15 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	3 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	25,1 A	P
	Tripping less than 0,1 s	5,9 ms	P
9.10.1.2*)	Test current 2,55 I_N (A) starting from cold for:	12,75 A	--

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Clause	Requirement + Test	Result - Remark	Verdict
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	10 s	P
	- 120 s		N/A
9.10.2.3 *)	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current 5I_N (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold		N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
*see Annex 1	Test current 10I_N (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „D“ 3 samples	**B4; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	4 A	--
	Sect. (mm²)	1,0 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		N/A
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		N/A
*see Annex 1	Test current $3I_N$ (A), starting from cold	12 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	4 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	20,1 A	P
	Tripping less than 0,1 s	6,7 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	10,2 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	5 s	P
	- 120 s		N/A
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold		--
	Opening time:	[s] [s] [s]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold		N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
**see Annex 1*	Test current 10I_N (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**B2; 1POLE**	P
8.6	**Automatic operation**		P
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_O**	**D_{O-1} D_{O-2} D_{O-3}**	P
	I_N (A)	2 A	--
	Sect. (mm²)	1,0 mm²	--
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.1	Test of time-current characteristic		N/A
9.10.2	Test of instantaneous tripping and of correct opening of the contacts		P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts		P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type		N/A
*see Annex 1	Test current $3I_N$ (A), starting from cold	6 A	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*	3 s	P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*		N/A
	Test current 5 I_N (A), starting from cold	10 A	P
	Tripping less than 0,1 s	8,9 ms	P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	5,1 A	--
*see Annex 1	opening time not less than 1 s or more than	[s] [s] [s]	P
	- 60 s	6 s	P
	- 120 s		N/A
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type		N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold		--
	Opening time:	[s] [s] [s]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold		N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
**see Annex 1*	Test current 10I_N (A), starting from cold		--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples	**B1; 1POLE**			P
8.6	**Automatic operation**				P
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_O**	**D_{O-1}**	**D_{O-2}**	**D_{O-3}**	P
	I_N (A)		1 A		--
	Sect. (mm²)		1,0 mm²		--
	Instantaneous tripping current	☒ B	☐ C	☐ D	--
9.10.1	Test of time-current characteristic				N/A
9.10.2	Test of instantaneous tripping and of correct opening of the contacts				P
9.10.2.1	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
	After each operation the indicating means shall show the open position of the contacts				P
9.10.2.2 *)	☒ For circuit-breakers of the B – Type				N/A
*see Annex 1	Test current $3I_N$ (A), starting from cold		3 A		--
	Opening time:	[s]	[s]	[s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*		4 s		P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*				N/A
	Test current 5 I_N (A), starting from cold		5 A		P
	Tripping less than 0,1 s		7,2 ms		P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		2,55 A		--
*see Annex 1	opening time not less than 1 s or more than	[s]	[s]	[s]	P
	- 60 s		7 s		P
	- 120 s				N/A
9.10.2.3 *)*	☐ For circuit-breakers of the C – Type				N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold				--
	Opening time:	[s]	[s]	[s]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*		N/A
	Test current 10 I_N (A), starting from cold		N/A
	Tripping less than 0,1 s		N/A
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type		N/A
**see Annex 1*	Test current 10I_N (A), starting from cold	_____	--
	Opening time:	[s] [s] [s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*		N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*		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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

	TESTS „E_1“ 3 + 3 samples C63, 1POLE, 3 kA(test at 4kA)				P
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).....:	3kA(test at 4kA)			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	241V			--
	Prospective current.....:	4kA			--
	Prospective current obtained.....:	4,06 kA			--
	Power factor .....:	0,75…0,80			--
	Power factor obtained .....:	0,77			--
	Sequence .....:	O – O – 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" =50 mm			--
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 .....:	3,45 kA	3,59 kA	3,86 kA	--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4(N)	35,5 ___ ___ ___	40,4 ____ ___ ___	40,2 ___ ___ ___	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.= 240 V. 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	<0,01	<0,01	<0,01	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	___60,5_A			--
	- 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	___100___A			--
		E_{1-1} [min]	**E_{1-2}** [min]	**E_{1-3}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	78s	51s	62s	P
9.12.11.4.2	**Test „E_1“(Test at service short-circuit capacity) three phase tests for single circuit-breakers**	**E_{1-4}**	**E_{1-5}**	**E_{1-6}**	
	Service short-circuit capacity (Ics).....:	3kA(test at 4kA)			--
	Test circuit: figure .....:	5			--
	Test voltage 1,05 Un	420V			--
	Prospective current.....:	4kA			--
	Prospective current obtained.....:	4,04 kA			--
	Power factor .....:	0,75…0,80			--
	Power factor obtained .....:	0,77			--
	Sequence .....:	O	O	O	--
		-	CO	O	
		O	-	CO	
		CO	O	-	
	T (min) .....:	____3_____min			--
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” = __50____ mm			--
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 .....:	3,49kA			--
	- 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.= 440 V. 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	<0,01	<0,01	<0,01	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,6 A			--
	- 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 A			--
		E_{1-4} [min]	**E_{1-5}** [min]	**E_{1-6}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	39s	82s	51s	P

	TESTS „E_1“ 3 + 3 samples C1, 1POLE, 3 kA(test at 4kA)				P
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-1}**	**E_{1-2}**	**E_{1-3}**	
	Service short-circuit capacity (Ics).....:	3kA(test at 4kA)			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	241V			--
	Prospective current.....:	4kA			--
	Prospective current obtained.....:	4,06kA			--
	Power factor .....:	0,75…0,80			--
	Power factor obtained .....:	0,77			--
	Sequence .....:	O – O – CO			--
	T (min) .....:	3 min			--

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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" = __50____ mm			--
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 .....:	0,94kA	0,95kA	1,54kA	--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4(N)	2,61 ___ ___ ___	2,76 ____ ___ ___	7,88 ___ ___ ___ ___	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.= _440____ V. 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	<0,01	<0,01	<0,01	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	___0,96__A			--
	- 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	___1,60___A			--
		E_{1-1} [min]	**E_{1-2}** [min]	**E_{1-3}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	24s	38s	29s	P
9.12.11.4.2	**Test „E_1“(Test at service short-circuit capacity) three phase tests for single circuit-breakers**	**E_{1-4}**	**E_{1-5}**	**E_{1-6}**	
	Service short-circuit capacity (Ics).....:	3kA(test at 4kA)			--
	Test circuit: figure .....:	5			--
	Test voltage 1,05 Un	422V			--
	Prospective current.....:	4kA			--
	Prospective current obtained.....:	4,04 kA			--
	Power factor .....:	0,75…0,80			--
	Power factor obtained .....:	0,77			--
	Sequence .....:	O	O	O	--
		-	CO	O	
		O	-	CO	
		CO	O	-	
	T (min) .....:	____3_____min			--
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” = __50____ mm			--
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 .....:	4,6 kA			--
	- 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.= 440_ V. 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	<0,01	<0,01	<0,01	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	0,96_A			--
	- 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	1,60_A			--
		E_{1-4} [min]	**E_{1-5}** [min]	**E_{1-6}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	39s	52s	41s	P

	TESTS „E_1“ 3 samples C63, 2POLE, 3 kA(test at 4kA)				P
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).....:	3kA(test at 4kA)			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	425V			--
	Prospective current.....:	4kA			--
	Prospective current obtained.....:	4,02 kA			--
	Power factor .....:	0,75…0,80			--
	Power factor obtained .....:	0,77			--
	Sequence .....:	O – O – CO			--
	T (min) .....:	3 min			--

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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" = __50____ mm			--
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 .....:	2,38kA	2,53kA	2,50kA	--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4(N)	14,4 ___ ___ ___	15,7 ____ ___ ___	16,4 ___ ___ ___	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.= _440____ V. 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	<0,01	<0,01	<0,01	P
	L2	<0,01	<0,01	<0,01	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	___60,5__A			--
	- 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	___100___A			--
		E_{1-1} [min]	**E_{1-2}** [min]	**E_{1-3}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	2min14s	3min2s	2min16s	P

	TESTS „E_1“ 3 samples C1, 2POLE, 3 kA(test at 4kA)				P
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).....:	3kA(test at 4kA)			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	425V			--
	Prospective current.....:	4kA			--
	Prospective current obtained.....:	4,02 kA			--
	Power factor .....:	0,75…0,80			--
	Power factor obtained .....:	0,77			--
	Sequence .....:	O – O – CO			--
	T (min) .....:	____3_____min			--
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” = __50____ mm			--
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 .....:	1,26kA	0,92kA	0,94kA	--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4(N)	4,67 ___ ___ ___	2,54 ____ ___ ___	2,02 ___ ___ ___ ___	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.= _440___ V. 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	<0,01	<0,01	<0,01	P
	L2	<0,01	<0,01	<0,01	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	0,96 A			--
	- 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	1,60 A			--
		E_{1-1} [min]	**E_{1-2}** [min]	**E_{1-3}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	37s	42s	29s	P

	TESTS „E_1“ 3 samples C63, 4POLE, 3 kA(test at 4kA)				P
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).....:	3kA(test at 4kA)			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	422V			--
	Prospective current.....:	4kA			--
	Prospective current obtained.....:	4,04 kA			--
	Power factor .....:	0,75…0,80			--
	Power factor obtained .....:	0,77			--

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Clause	Requirement + Test	Result - Remark	Verdict

	Sequence .....:	O – O – CO			--
	T (min) .....:	3 min			--
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" = 50 mm			--
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 .....:	2,73kA	2,60kA	2,64kA	--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4(N)	16,5 ___ ___ ___	16,4 ___ ___ ___	16,9 ___ ___ ___ ___	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.= _440___ V. 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	<0,01	<0,01	<0,01	P
	L2	<0,01	<0,01	<0,01	P
	L3	<0,01	<0,01	<0,01	P
	L4(N)	<0,01	<0,01	<0,01	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 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)	___60,5__A			--
	- 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___A			--
		E_{1-1} [min]	**E_{1-2}** [min]	**E_{1-3}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	56s	37s	28s	P

	TESTS „E_1“ 3 samples C1, 4POLE, 3 kA(test at 4kA)				P
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).....:	3kA(test at 4kA)			--
	Test circuit: figure .....:	3			--
	Test voltage 1,05 Un	422V			--
	Prospective current.....:	4kA			--
	Prospective current obtained.....:	4,04 kA			--
	Power factor .....:	0,75…0,80			--
	Power factor obtained .....:	0,77			--
	Sequence .....:	O – O – CO			--
	T (min) .....:	____3_____min			--
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” = __50____ mm			--
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 .....:	1,28kA	1,22kA	1,26kA	--
	$I^2t \leq$ _____ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ _____kA^2s L1 L2 L3 L4(N)	6,04 ___ ___ ___	3,76 ____ ___ ___	4,28 ___ ___ ___	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.= _440____ V. 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	<0,01	<0,01	<0,01	P
	L2	<0,01	<0,01	<0,01	P
	L3	<0,01	<0,01	<0,01	P
	L4(N)	<0,01	<0,01	<0,01	P
	Electric strength test:				P
	Test voltage 1500 V (see 9.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	0,96 A			--
	- 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	1,60 A			--
		E_{1-1} [min]	E_{1-2} [min]	E_{1-3} [min]	--
	Tripping within ☐ 1 hour / ☐ 2 hour	56s	42s	31s	P

	Annex E		N/A
	Special requirements for auxiliary circuits for safety extra-low voltage		N/A
8.1.3	**Clearances and creepage distances**		N/A
	Additional note to table 4 NOTE 4 live parts in auxiliary circuits intended to be connected to safety extra low voltages shall be separated from circuits with higher voltages in accordance with the requirements of 411.1.3.3 of IEC 60364-4-41		--
	Compliance is checked by inspection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9.7.4	**Dielectric strength of the auxiliary circuits**		N/A
	Note: A test for circuits intended for connection to safety extra-low voltage is under consideration		N/A

	Annex J		N/A
	Particular requirements for circuit-breakers with screw less type terminals for external copper conductors (In not exceeding 20 A, cross-sectional area up to 4 mm^2		N/A
J.6	**Marking**		**N/A**
	Universal terminals		--
	- no marking		N/A
	Non-universal		--
	- declared for rigid-solid conductors	marked with: “sol”	N/A
	- declared for rigid(solid and stranded) .....:	marked with: “r”	N/A
	- declared for flexible conductors .....:	Marked with: “f”	N/A
	The markings should appear on the circuit-breaker or, if available space is not sufficient, on smallest package unit or in technical information .....:		N/A
	Indication of length of insulation to be removed on the circuit-breaker.....:	_____mm	N/A
J.7	**Standard conditions for operation in service**		N/A
	Clause 7 applies		N/A
J.8	**Constructional requirements**		N/A
	Clause 8 applies with the follow modifications:		N/A
	In clause 8.1.5 only –5.1, -5.2. –5.3, - 5.6 and - 5.7 apply		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.1	**Connection or disconnection of conductors**		N/A
	The connection or disconnection shall be made by:		N/A
	A general purpose tool or by a convenient device integral with the terminal or		N/A
	for rigid conductors by simple insertion		N/A
	For disconnection an operation other than a pull shall be necessary (push-wire terminals)		N/A
	Universal terminals shall accept rigid (solid or stranded and flexible unprepared conductors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Non-universal terminals shall accept conductors declared by the manufacturer		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.2	**Dimensions of connectable conductors**		N/A
	The dimensions of connectable conductors are given in table J.1		N/A
	The ability to connect these conductors shall be checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.3	**Connectable cross-sectional areas**		N/A
	The nominal cross-sections to be clamped are given in table J.2		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.4	**Insertion and connection of conductors**		N/A
	The insertion and disconnection of the conductors shall be made in accordance with the manufacturer's instructions		N/A
J.8.5	**Design and construction of terminals**		N/A
	Terminals shall be designed and constructed that:		N/A
	- each conductor is clamped individually		N/A
	- connection or disconnection connectors connected or disconnected separate or same		N/A
	- inadequate insertion of the conductor is avoided		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.6	**The terminals shall be resistant to ageing**		N/A
	Compliance is checked by the tests of J.9.3		N/A
J.9	**Tests**		--
	Clause 9 applies, by replacing 9.4 and 9.5 by the follow		N/A
J.9.1	**Test of reliability of screw less terminals**		N/A
J.9.1.1	**Reliability of screw less system**		N/A
	5 times connection and disconnection		N/A
	3 rigid conductors min. cross-section max. cross-section	_____mm^2 _____mm^2	N/A
	3 flexible conductors min. cross-section max. cross-section	_____mm^2 _____mm^2	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	After tests, the terminal shall not be damage in such a way as to impair its further use		N/A
J.9.1.2	**Test of reliability of connection**		N/A
	3 terminals of poles of new sample are fitted with new copper conductors according table J.2		N/A
	rigid conductors min. cross-section max. cross-section	_____mm² _____mm²	N/A
	flexible conductors min. cross-section max. cross-section	_____mm² _____mm²	N/A
	Each conductor is either pushed as far as possible into the terminal or shall be inserted so that adequate connection is obvious		N/A
	After tests, no wire of the conductor shall have escaped outside the terminals		N/A
J.9.2	**Tests of reliability of terminals for external conductors: Mechanical strength**		N/A
	Three terminals of new samples are fitted with new conductors of the type and of the minimum and maximum cross sectional area according table J.2.		N/A
	Each conductor is subjected to a pull force of value shown in table J.3. for 1 min		N/A
	Terminal screw torque : $^2/_3$ of table 11	_____ Nm	N/A
	rigid conductors min. cross-section max. cross-section	_____ mm² / _____N _____ mm² / _____N	N/A
	flexible conductors min. cross-section max. cross-section	_____ mm² / _____N _____ mm² / _____N	N/A
	During the test the conductor shall not slip out of the terminal		N/A
J.9.3	**Cycling test**		N/A
	The test is carried out with new copper conductors having a cross sectional area according table 10	_____ mm ²	N/A
	The test is carried out on new samples(a sample is one pole, the number of which is defined below, according the type of terminal		N/A
	- universal terminals for rigid (solid and stranded) and flexible conductors	3 + 3 samples	N/A
	- non-universal terminals for solid conductors only	3 samples	N/A
	-- non- universal terminals for rigid (solid and stranded) conductors	3 + 3 samples	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	- non-universal terminals for flexible conductors only	3 samples			N/A
	The conductors are connected in series as in normal use to each of the three samples as defined on fig. J.1.				N/A
	The sample is provided with a hole or equivalent in order to measure the voltage drop on the terminal				N/A
	The test arrangement is placed in a heating cabinet which is initially on 20°C				N/A
	Except the cooling period the test current (rated current) is applied to the circuit	I test _____ A			N/A
	The samples shall be subjected to 192 temperature cycles, each cycle having a duration of +/- 1 hour				N/A
	Description of the temperature cycle: In 20 min raised to 40°C, maintained for 10 min, then cool down in 20 min to 30 °C, maintained for 10 min. For measurement of the voltage drop it is allowed to cool down to 20 °C				N/A
	The maximum voltage drop, measured on each terminal, at the end of the 192nd cycle, with Inom. shall not exceed the smaller of the two following values - either 22,5 mV - or 1,5 times the value measured after the 24 cycle	Uv max. _____ mV			N/A
	Sample after 24 cycles: rigid conductors (mV) flexible conductors (mV)	J_1 _____ _____	J_2 _____ _____	J_3 _____ _____	N/A
	Sample after 192 cycles: rigid conductors (mV) flexible conductors (mV)	J_1 _____ _____	J_2 _____ _____	J_3 _____ _____	N/A
	After this test the samples shall show no changes evidently impairing further use, such as cracks, deformations or like				N/A

	Annex K		N/A
	Particular requirements for circuit-breakers with flat quick-connect terminations		--
K.6	**Marking**		N/A
	The whole of clause 6 applies		N/A
	Addition after the lettered item k		--

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Clause	Requirement + Test	Result - Remark	Verdict
	The following information regarding the female connector according to IEC 61210 and the type of conductor to be used shall be given in the manufacturer's instructions		N/A
	a) manufacturers name or trade mark		--
	b) type reference		N/A
	c) information on cross-sections of conductors and colour code of insulating female connectors (see table K.1)		N/A
	d) the use of only silver or tin-plated copper alloys		N/A
K.7	**Standard conditions for operation in service**		N/A
	Clause 7 applies		N/A
K.8	**Constructional requirements**		N/A
	Clause 8 applies with the follow modifications:		N/A
	replacement of 8.1.3 by:		N/A
K.8.1	**Clearances and creepage distances (see annex B)**		N/A
	Subclause 8.1.3 applies, the female connectors being fitted to the male tabs of the circuit-breaker		N/A
	Replacement of 8.1.5 by:		N/A
K.8.2	**Terminals for external conductors**		N/A
K.8.2.1	Male tabs and female connectors shall be of a metal having mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use		N/A
K.8.2.2	The nominal width of male tab is 6,3 mm and the thickness 0,8 mm, applicable to rated currents up to and including 16 A NOTE 1:The use for rated currents up to and including 20 A is accepted in BE, FR, IT, PT, ES and US		N/A
	The dimensions of the male tab shall comply with those specified in table K.3 and in figures K.2, K3, K4, K5, where the dimensions A, B, C, D, E, F, J, M, N and Q are mandatory		N/A
	The dimensions of the female connector which may be fitted-on are given in figure K.6 and in table K.4		N/A
	Compliance is checked by inspection and by measurement	See table on page _____	N/A
K.8.2.3	**Male tabs shall be securely retained**		N/A
	Compliance is checked by the mechanical overload test of K.9.1		N/A
K.9	**Tests**		N/A

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	Clause 9 applies, with follow modifications:		N/A
	Replacement of 9.5 by:		N/A
K.9.1	**Mechanical overload-force**		N/A
	10 terminals of circuit-breakers, mounted as normal use are subjected to a axial push force and successively the axial pull force specified in table K2 applied to male tab once	push force 96 N pull force 88 N	N/A
	No damage which could impair further use shall occur to the tab or to the circuit-breaker in which the tab is integrated		N/A
	Addition to 9.8.3:		N/A
	Fine –wire thermocouples shall be placed in such a way as not to influence the contact or the connection area. An example of placement is shown in fig K.1		N/A

		Dimensions of tabs according Table K.3		Measured in mm	Verdict
		Minimum	Maximum		N/A
A	Dimple	0,7	1,0	_____	N/A
	Hole	0,5	1,0	_____	N/A
B	Dimple	7,8 min		_____	N/A
	Hole	7,8 min		_____	N/A
C	Dimple	0,77	0,84	_____	N/A
	Hole	0,77	0,84	_____	N/A
D	Dimple	6,20	6,40	_____	N/A
	Hole	6,20	6,40	_____	N/A
E	Dimple	3,6	4,1	_____	N/A
	Hole	4,3	4,7	_____	N/A
F	Dimple	1,6	2,0	_____	N/A
	Hole	1,6	2,0	_____	N/A
J	Dimple	8°	12°	_____	N/A
	Hole	8°	12°	_____	N/A
M	Dimple	2,2	2,5	_____	N/A
	Hole	---	---	---	---
N	Dimple	1,8	2,0	_____	N/A
	Hole	---	---	---	---
P	Dimple	0,7	1,8	_____	N/A
	Hole	0,7	1,8	_____	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

		Dimensions of tabs according Table K.3		Measured in mm	Verdict
Q	Dimple	8,9 min	---	_____	N/A
	Hole	8,9 min	---	_____	N/A
B3			7,8 max	_____	N/A
L2			3,5 max	_____	N/A

	Annex L		N/A
	Specific requirements for circuit-breakers with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors		N/A
L.6	**Marking**		**N/A**
	In addition to clause 6 the following apply:		N/A
	Terminal marking according table L.1, on the circuit breaker, near the terminals		--
	Conductor types accepted: Copper only Aluminium only Aluminium and copper	 ☐ None ☐ "Al" ☐ "Al/Cu"	N/A N/A N/A N/A
	Other information concerning the number of conductors, screw torque (if different from table 11) and cross-section shall be indicated on the circuit-breaker	_____ Nm _____ mm²	N/A
L.7	**Standard conditions for operation in service**		N/A
	Clause 7 applies		N/A
L.8	**Constructional requirements**		N/A
	Clause 8 applies with the following exceptions:		N/A
8.1.5.2	is completed by:		N/A
	For connection of aluminium conductors, circuit-breakers shall be provided with screw-type terminals allowing the connection of conductors having nominal cross-sections as shown in table L.2		N/A
	Terminals for the connection of aluminium conductors and terminals of aluminium for the connection of copper or aluminium conductors shall have mechanical strength adequate to withstand the tests of 9.4, with the test conductors tightened with the torque indicated in table 11, or with the torque specified by the manufacturer, which shall never be lower than that specified in table 11.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Compliance is checked by inspection, by measurement and by fitting in turn one conductor of the smallest and one of the largest cross-section areas as specified		N/A
8.1.5.4	Terminals shall allow the conductors to be connected without special preparation		N/A
	Compliance is checked by inspection and by the tests of L.9		N/A
L.9	**Tests**		N/A
	Clause 9 applies with the following modifications/additions:		N/A
	For the tests which are influenced by the material of the terminal and the type of conductor that can be connected, the test conditions of table L.3 are applied		N/A
	Additionally the test of L.9.2 is carried out on terminals separated from the circuit-breaker		N/A
L.9.2	**Current cycling test**		N/A
	This test is carried out on separate terminals		N/A
	The general arrangement of the samples shall be as shown in figure L.1		N/A
	90 % of torque stated by the manufacturer or selected in table 11 used for the specimens	torque:_____Nm	N/A
	The test is carried out with conductors according to table L.5. The length of the test conductor from the point of entry to the screw-type terminal specimens to the equalizer shall be as in table L.6	cross-section:_____mm^2 minimum conductor length:_____mm	N/A
	Cross section of equalizer not greater than that given in table L.7	max. crosssection_____mm^2	N/A
L.9.2.5	Test method and acceptance criteria		N/A
	Test loop subjected to 500 cycles of 1h current-on and 1h current-off, starting at an a.c. current value of 1,12 times the test current value determined in table L.8	test current:_____A	N/A
	Near the end of each current-on period of the first 24 cycles, the current shall subsequently be adjusted to raise the temperature of the reference conductor to 75°C		N/A
	At the end of the 25^{th} cycle the test current shall be adjusted the last time and the stable temperature shall be recorded as the first measurement. No further adjustment of test current for the remainder of the test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Temperatures recorded for at least one cycle of each working day, and after approximately 25, 50, 75, 100, 125, 175, 225, 350, 425 and 500 cycles			N/A
	For each screw-type terminal			N/A
	- the temperature rise shall not exceed 110 K			N/A
	- the stability factor Sf shall not exceed ± 10 °C			N/A
	ambient air temperature: _____°C	max. temperature rise [K]	max. stability factor Sf [°C]	N/A
	Terminal 1			N/A
	Terminal 2			N/A
	Terminal 3			N/A
	Terminal 4			N/A
	Terminal 5			N/A
	Terminal 6			N/A
	Terminal 7			N/A
	Terminal 8			N/A

	TABLE: Heating Test		**P**
	Test voltage (V) .....:		**—**
	Ambient (°C) .....:		**—**

Thermocouple Locations	**max. temperature measured, (K)**	**max. temperature limit, (K)**

Supplementary information:
Refer to test sequence B of this test report about temperature rise

	TABLE: Dielectric Strength	**P**

Test voltage applied between:	**Test potential applied (V)**	**Breakdown / flashover (Yes/No)**
with the circuit-breaker in the open position, between each pair of the terminals which are electrically connected together when the circuit-breaker is in the closed position, in turn on each pole;	2000	No

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Clause	Requirement + Test	Result - Remark	Verdict

with the circuit-breaker in the closed position, between each pole and the others connected together;	2000	No
with the circuit-breaker in the closed position, 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;	2000	No
Supplementary information:		

	TABLE: insulation resistance measurements		N/A
Insulation resistance R between:		**R (MΩ)**	**Required R (MΩ)**
Between mains poles (primary fuse disconnected)			N/A
Between parts separated by basic or supplementary insulation			N/A
Between parts separated by double or reinforced insulation			N/A
Supplementary information:			

	TABLE: Impact Resistance		N/A
Impacts per surface	**Surface tested**	**Impact energy (Nm)**	**Comments**
Supplementary information:			

	TABLE: Clearance And Creepage Distance Measurements					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)**
L-N for off position	4,0k	400	4,0	5,94	4,0	8,96
Pole to pole	4,0k	400	3,0	-	4,0	-
Live part to operating means	4,0k	400	3,0	23,52	4,0	34,68
Live part to DIN rail	4,0k	400	3,0	23,26	4,0	34,62

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:						

	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) ..... :		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Enclosure	HUAJIA ELECTRICAL (GROUP) CO., LTD.	125	1,06	
Supplementary information:				

	TABLE: Needle- flame test (NFT)				N/A
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Supplementary information: **NFT not relevant (or applicable) for Parts of material classified as V-0 or V-1** **NFT not relevant (or applicable) for Base material of PCBs classified as V-0 or if relevant VTM-0**					

	TABLE: Resistance to heat and fire - Glow wire tests						P
Object/ Part No./ Material	**Manufacturer / trademark**	**Glow wire test (GWT); (°C)**					**Verdict**
		550	**650**		**750**	**960**	
			te	**ti**	**te** ti		

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Clause	Requirement + Test	Result - Remark	Verdict

Enclosure/PA66	HUAJIA ELECTRICAL (GROUP) CO., LTD.	--	--	--	--	--	OK	P

Object/ Part No./ Material	Manufacturer / trademark	Glow-wire flammability index (GWFI), °C				GW ignition temp. (GWIT), °C		Verdict
		550	650	750	850	675	775	
		--	--	--				

The test specimen passed the glow wire test (GWT) with no ignition [(te – ti) ≤ 2s] (Yes/No) :	P
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No) .....:	N/A
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)?.....:	N/A
Ignition of the specified layer placed underneath the test specimen (Yes/No) .....:	N/A

Supplementary information:

550 °C GWT not relevant (or applicable) to parts of material classified at least HB40 or if relevant HBF
The GWIT pre-selection option, the 850 °C GWFI pre-selection option, and the 850 °C GWT are not relevant (or applicable) for attended appliances.

	TABLE: Threaded Part Torque Test		P
Threaded part identification	**Diameter of thread (mm)**	**Column number (I, II, or III)**	**Applied torque (Nm)**
Terminal screw	4,86	II	2,0

Supplementary information:

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Clause	Requirement + Test	Result - Remark	Verdict

	Annex 1	
	EN 60898-1 **COMMON MODIFICATIONS**	

	GENERAL		P
9.12	**Short-circuit tests**		P
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		P
	voltage (including recovery voltage) : 0, -5%		P

	TESTS „A“ 1 sample	C63/1POLE, C63/4POLE	P
6	**MARKING AND OTHER INFORMATION**		P
6.1	**Standard marking:**		P
	f) Rated short circuit capacity (A):within a rectangle, without symbol “A”.....	3000 in rectangle	P
	h)Calibration temperature, if different from 30°C		P
	j) Energy limiting class in a square in accordance with annex ZA, if applied	Not applied	N/A
	k) Making and breaking capacity on an individual protected pole of multipole circuit-breakers (Icn1), if different from Icn	Icn1=Icn	N/A
6.2	**Additional marking**		P
	Additional marking to other standards (EN or IEC or other) is allowed under the follow conditions:	EN 60898-1	P
	- the circuit-breaker shall comply with all the requirements of the additional standard;		P
	- the relevant standard to which the additional marking refers shall be indicated adjacent to this marking and shall be clearly differentiated or separated from the standard marking according to cl. 6.1		P
	Compliance is checked by inspection and by carrying out all the test sequences required by the relevant standard. Equivalent or less severe test sequences need not be repeated.		P
6.3	**Guidance table for marking**		P
	Each MCB shall be marked in a durable manner with all or, for small apparatus, according table for marking		P

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „C“ 3 + 3 samples	**C1 C2 C3**	**P**
9.11.3	Dielectric strength reduced to 900 V		P

	TESTS „D“ 3 samples				**P**
9.10	**Tests: D0**	**D0-1**	**D0-2**	**D0-3**	**P**
9.10.2.2 *)	☒ For circuit-breakers of the B – Type				P
*see Annex 1	Test current 3I_N (A), starting from cold	**Test results refer to Test sequence D in this report.**			--
	Opening time:	[s]	[s]	[s]	--
	- 0,1s ≤ t *[≤ 45s (≤ 32A) *)acc. EN60898]*				P
	- 0,1s ≤ t *[≤ 90s (> 32A) *)acc. EN60898]*				P
	Test current 5 I_N (A), starting from cold		A		P
	Tripping less than 0,1 s		ms		P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:		A		--
*see Annex 1	opening time not less than 1 s or more than	[s]	[s]	[s]	P
	- 60 s		s		P
	- 120 s				P
9.10.2.3 *)*	☒ For circuit-breakers of the C – Type				P
*see Annex 1	Test current 5I_N (A), starting from cold	**Test results refer to Test sequence D in this report.**			--
	Opening time:	[s]	[s]	[s]	--
	- 0,1s ≤ t *[≤ 15s (≤ 32A) *)acc. EN60898]*				P
	- 0,1s ≤ t *[≤ 30s (> 32A) *)acc. EN60898]*				P
	Test current 10 I_N (A), starting from cold				P
	Tripping less than 0,1 s				P
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:				--
*see Annex 1	opening time not less than 1 s or more than	[s]	[s]	[s]	P
	- 60 s				P
	- 120 s				P
9.10.2.4 *)*	☐ For circuit-breakers of the D – Type				N/A
*see Annex 1	Test current 10I_N (A), starting from cold				--
	Opening time:	[s]	[s]	[s]	--
	- 0,1s ≤ t *[≤ 4s (≤ 32A) *)acc. EN60898]*				N/A
	- 0,1s ≤ t *[≤ 8s (> 32A) *)acc. EN60898]*				N/A

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
9.10.1.2*)*	Test current 2,55 I_N (A) starting from cold for:	_____	--
**see Annex 1*	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A

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

ANNEX C (NORMATIVE)

replace table C.1 by:

Test sequence and number of samples to be submitted for certification purposes
Table C.1 - Test sequences

Test sequence		Clause or subclause	Test (or inspection)
A		6 8.1.1 8.1.2 9.3 8.1.3 8.1.6 9.4 9.5 9.6 9.14 8.1.3 9.15 9.16	Marking General Mechanism Indelibility of marking Clearance and creepage distances (external parts only) Non-interchangeability Reliability of screws, current-carrying parts and connections Reliability of terminals for external conductors Protection against electric shock Resistance to heat Clearances and creepage distances (internal parts) Resistance to abnormal heat and to fire Resistance to rusting
B		9.7 9.8 9.9	Dielectric properties Temperature-rise 28-day test
C	C_1	9.11 9.12.11.2.1 9.12.12	Mechanical and electrical endurance Performance at reduced short-circuit currents Verification of the circuit-breaker after short-circuit tests
	C_2	9.12.11.2.2 9.12.12	Short-circuit test for verifying the suitability of circuit-breakers for use in IT systems Verification of the circuit-breaker after short-circuit tests
D	D_0	9.10	Tripping characteristic
	D_1	9.13 9.12.11.3 9.12.12	Resistance to mechanical shock and impact Short-circuit performance at 1 500 A Verification of circuit-breaker after short-circuit tests
E	E_1	9.12.11.4.2 and 9.12.12	Service short-circuit capacity (I_{cs}) Verification of circuit-breaker after short-circuit tests
	E_2	9.12.11.4.3 and 9.12.12	Performance at rated short-circuit capacity (I_{cn}) Verification of circuit-breaker after short-circuit tests
	E_3	9.12.11.4.4 and 9.12.12	Performance at rated making and breaking capacity (I_{cn1}) on an individual pole of multipole circuit-breakers Verification of circuit-breaker after short-circuit tests
NOTE With the agreement of the manufacturer the same samples may be used for more than one test sequence.			

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

replace table C.2 by:

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

Test sequence		Number of samples	Minimum number of samples which shall pass the test[a) b)]	Maximum number of samples for repeated tests[c)]
A		1	1	--
B		3	2	3
C	C_1	3	2 [e)]	3
	C_2 [f)]	3	2[e)]	3
D		3	2[e)]	3
E_1		3 + 4 [d)]	2 [e)] + 2 [d), e)]	3 + 4 [d)]
E_2		3 + 4 [d)]	2 [e)] + 3 [d), e)]	3 + 4 [d)]
E_3		3	2 [e)]	3

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

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

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

d) Supplementary samples in the case of single-pole circuit-breakers rated 230/400 V or 240/415 V (see table 1).

e) All samples shall meet the test requirements of 9.12.10, 9.12.11.2, 9.12.11.3 and 9.12.11.4, as appropriate.

f) For this sequence read "number of protected poles" instead of "number of samples". In total a maximum of three test sequences may be repeated.

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

replace table C.3 by:

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

Test sequence		Number of samples depending on number of poles [a]			
		One pole [b]	Two poles [c]	Three poles [d]	Four poles [e]
A		1 max. rated I_N	1 [g),i)] max. rated I_N	1[i)] max. rated I_N	1[i)] max. rated I_N
B		3 max. rated I_N	3[g)] max. rated I_N	3 max. rated I_N	3 max. rated I_N
C	C_1	3 max. rated I_N	3[g)] max. rated I_N	3 max. rated I_N	3 max. rated I_N
C	C_2	3 max. rated I_N	2 max. rated I_N for 2 protected poles, or 3 max. rated I_N for one protected pole	1 max. rated I_N	1 max. rated I_N
$D_0 + D_1$		3 max. rated I_N	3[h)] max. rated I_N	3 max. rated I_N	3 max. rated I_N
D_0		1 of all other rated I_N			
E_1		3+4 [f)] max. rated I_N 3+4[f)] min. rated I_N	3 max. rated I_N 3 min. rated I_N	3 max. rated I_N 3 min. rated I_N	3 max. rated I_N 3 min. rated I_N
E_2		3+4[f)] max. rated I_N 3+4[f)] min. rated I_N	3 max. rated I_N 3 min. rated I_N	3 max. rated I_N 3 min. rated I_N	3 max. rated I_N 3 min. rated I_N
E_3		[k)]	3[j)] max. rated I_N	3[j)] max. rated I_N	3[j)] max. rated I_N

a) If a test is to be repeated according to the acceptance criteria of C.2, a new set of samples is used for the relevant test sequence. In repeated tests all results shall be satisfactory.
b) If only multipole circuit-breakers are submitted, this column applies to the set of samples having the smallest number of poles (instead of the relevant column).
c) Applicable to two-pole circuit-breakers whether with two protected poles or with one protected pole.
d) This series is omitted when four-pole circuit-breakers are also tested.
e) Also applicable to circuit-breakers with three protected poles and a neutral pole.
f) Supplementary samples in case of single-pole circuit-breakers of 5.3.1.4.
g) This test sequence is omitted when three-pole or four-pole circuit-breakers have been tested.
h) This test sequence shall be omitted for two-pole circuit breakers with two protected poles, when three-pole or four-pole circuit-breakers have been tested.
i) When multipole circuit-breakers are submitted, a maximum of four screw-type terminals for external conductors are subjected to the tests of 9.5, i.e. two supply and two load terminals.
j) If each pole of the multipole is identical to the individual pole tested in E2, this test is omitted. If not this test is carried out on an individual protected pole, taken at random, of the circuit-breaker with the highest number of poles
k) Covered by test sequence E2

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Clause	Requirement + Test	Result - Remark	Verdict

	Annex ZC (normative)	
	EN 60 898-1 **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, Denmark, Germany, Netherlands, Norway and Switzerland**	
	The upper limit of current for use of screw less terminals is 16 A	
J.3.3	**Austria, Belgium, Denmark, France, Germany, Italy, Portugal, Spain, Sweden, Switzerland, and United Kingdom**	
	Only universal screwless type terminals are accepted.	
K1	**BELGIUM, FRANCE, ITALY, PORTUGAL, SPAIN, AND UNITED KINGDOM**	
	The use of circuit-breakers with flat quick-connect terminations for rated currents up to and including 20 A is accepted.	
K.8.2.2	**BELGIUM, FRANCE, ITALY, PORTUGAL, SPAIN, AND UNITED KINGDOM**	
	The use for rated currents up to and including 20 A	

Attachment 1

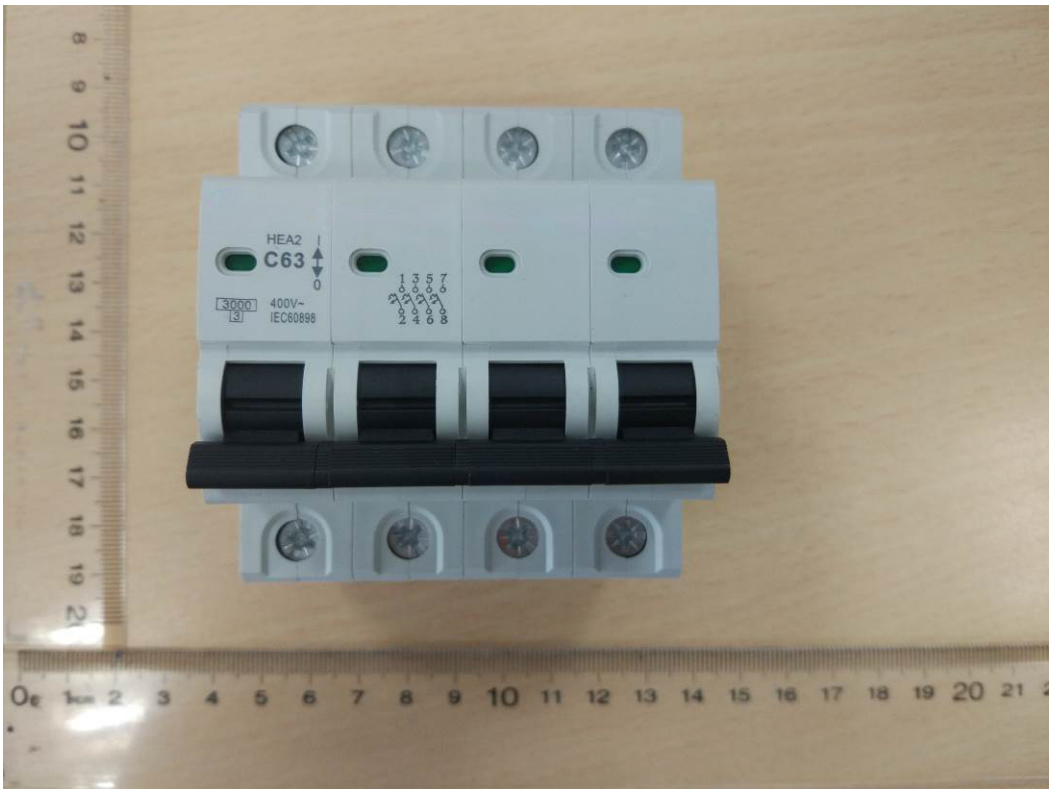
Measuring equipment list (Test location: The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)):

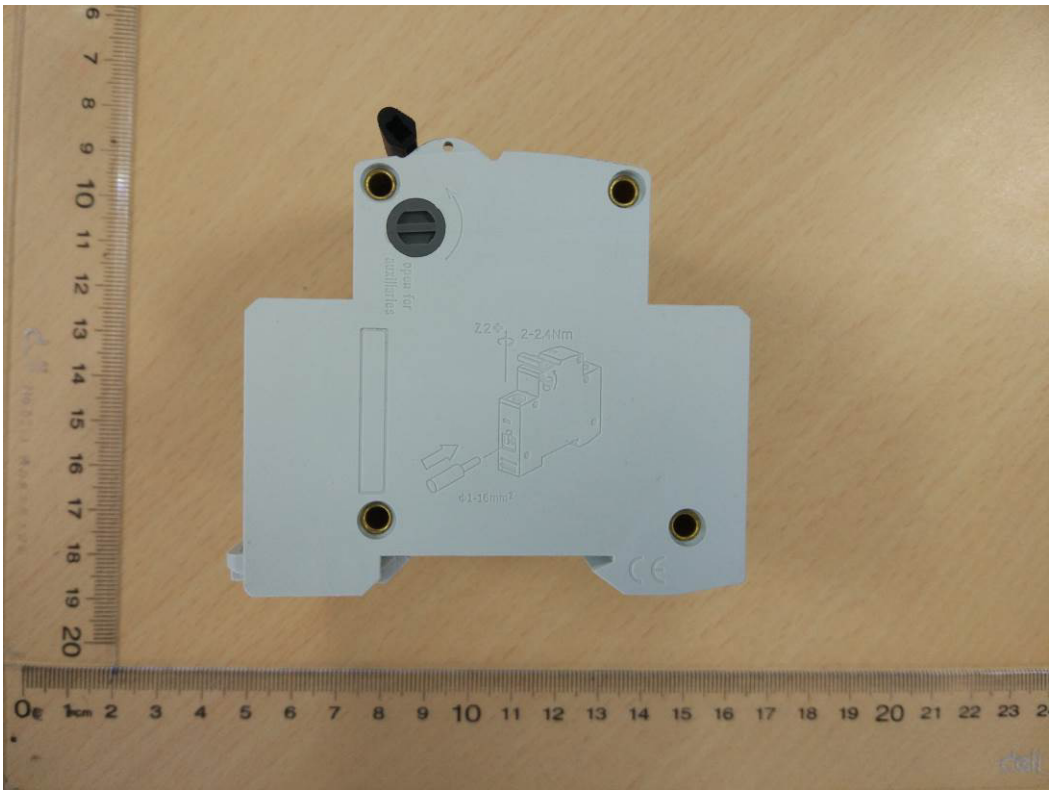
Measuring equipment	Type	Inventory / Serial No.	Next Calibration
AC and DC current meter	T19-A	SB-Ⅰ-A006	2017-09-13
Glass thermometers	(0-100)℃	SB-Ⅰ-C004	2017-09-13
Glass thermometers	0-100℃	SB-Ⅰ-C007	2017-09-13
Temperature and humidity recorder	HC-02	SB-Ⅰ-C015	2017-09-13
Digital millisecond meter	DTM-3	SB-Ⅰ-D002	2018-04-12
Electronic stopwatch	JD-2Ⅱ	SB-Ⅰ-D004	2017-09-13
Digital timer	CSY-5E	SB-Ⅰ-D016	2017-09-13
Digital timer	CSY-5E	SB-Ⅰ-D017	2017-09-13
Digital timer	CSY-5E	SB-Ⅰ-D018	2017-09-13
Yernier caliper	0-100mm	SB-Ⅰ-E003	2017-09-13
Scale magnifier	PEAK2017-L	SB-Ⅰ-E004	2017-09-13
Digital force gauge	HG-500	SB-Ⅰ-F006	2017-09-13
Current mutual inductance meter	HL55	SB-Ⅰ-M004	2018-04-15
Current mutual inductance meter	HL55	SB-Ⅰ-M005	2018-04-15
Current mutual inductance meter	HL55	SB-Ⅰ-M006	2018-04-14
Current mutual inductance meter	HL23-1	SB-Ⅰ-M010	2017-09-13
Current mutual inductance meter	HL23-1	SB-Ⅰ-M011	2018-04-15
Current mutual inductance meter	HL23-1	SB-Ⅰ-M012	2019-04-14
Current mutual inductance meter	HL23-5	SB-Ⅰ-M036	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M037	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M038	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M039	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M040	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M041	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M042	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M043	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M044	2018-10-27
Current mutual inductance meter	HL23-5	SB-Ⅰ-M045	2018-10-27
Insulation resistance measuring instrument	1508	SB-Ⅰ-N012	2018-04-12
Standard test	---	SB-Ⅰ-S002-1	2017-09-13
Glow wire test apparatus	GWH-A	SB-Ⅰ-S010	2017-09-13
Digital power meter	GDW1200A	SB-Ⅰ-S013	2017-09-13

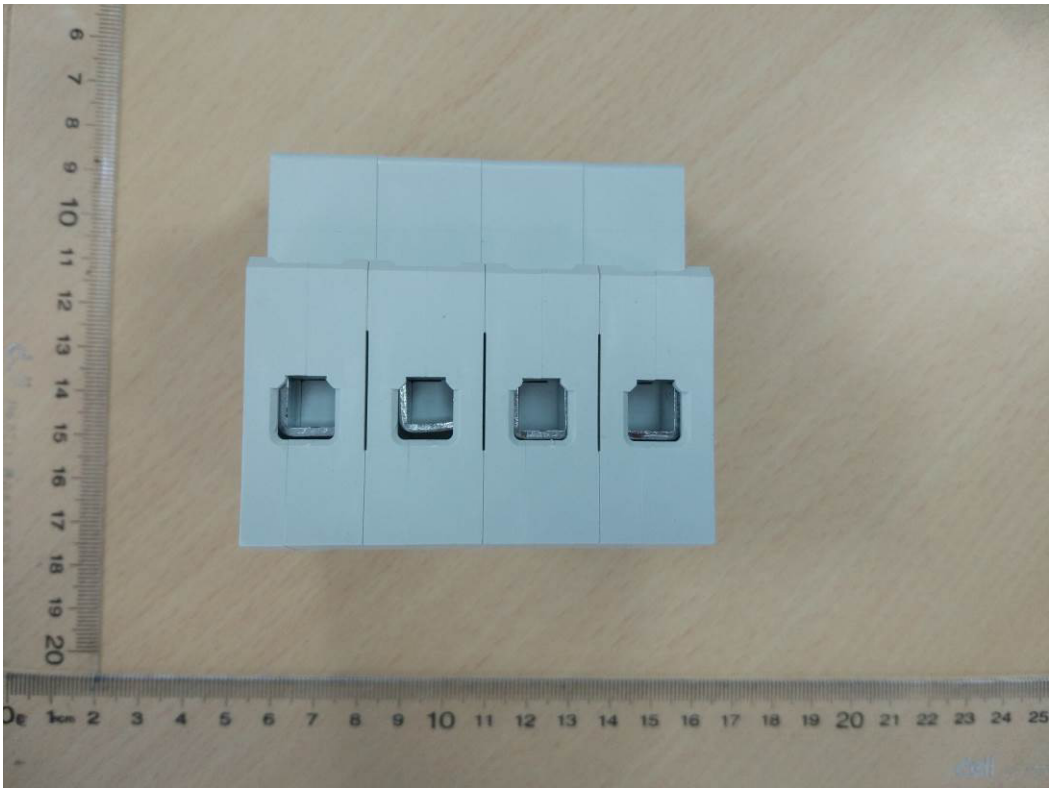
Measuring equipment	Type	Inventory / Serial No.	Next Calibration
Digital power meter	GDW305B	SB-Ⅰ-S018	2017-09-13
Digital power meter	GDW305B	SB-Ⅰ-S019	2017-09-13
Torque screwdriver	NQ-2	SB-Ⅰ-S021	2017-09-13
Torque screwdriver	NQ-4	SB-Ⅰ-S022	2018-04-12
Ball pressure test device	SH9104	SB-Ⅰ-S031	2017-09-13
Test finger	75N	SB-Ⅰ-S033	2017-09-13
Impulse voltage test instrument	GC-20	SB-Ⅰ-S035	2017-09-13
Current transformer	34970A	SB-Ⅰ-S040	2017-09-13
Current transformer	GENESIS	SB-Ⅰ-S041	2018-04-13
16 Channel data collecting system	SYNERGY	SB-Ⅰ-S045	2018-04-12
Coil	F-4419 F-4420 F-4421	SB-Ⅰ-S048	2017-09-13
Coil	FJ-4141 FJ-4142 FJ-4143	SB-Ⅰ-S056	2017-09-13
Withstand voltage tester	VG2672F	SB-Ⅰ-S058	2018-04-12
Into the test box type high temperature	GD-V180M40P60	SB-Ⅰ-S060	2017-09-13
Into the test box type high temperature	HW-V160P15P60	SB-Ⅰ-S062	2017-09-13
Alternating high and low temperature test box	EL-10KA	SB-Ⅰ-S067	2017-09-13
Electronic balance	DT5000	SB-Ⅱ-F006	2017-09-13
Leakage current tester	WB2675	SB-Ⅱ-S032	2018-04-13

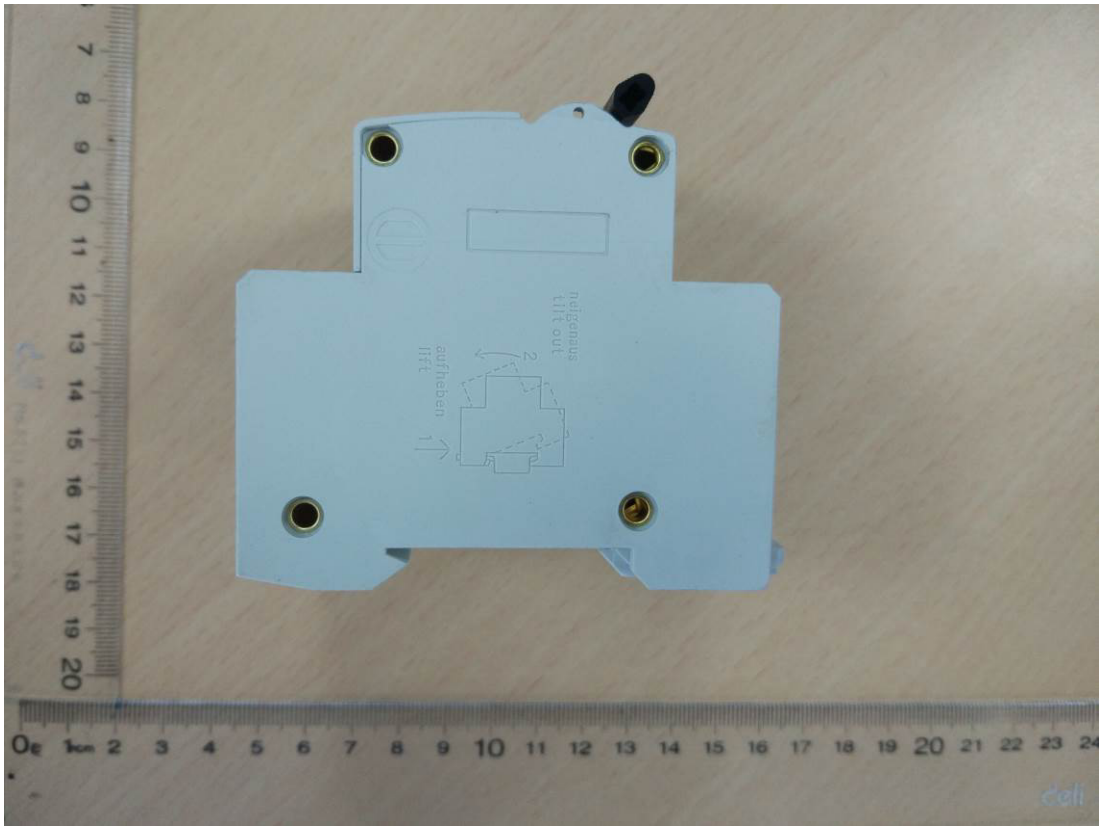
Attachment 2

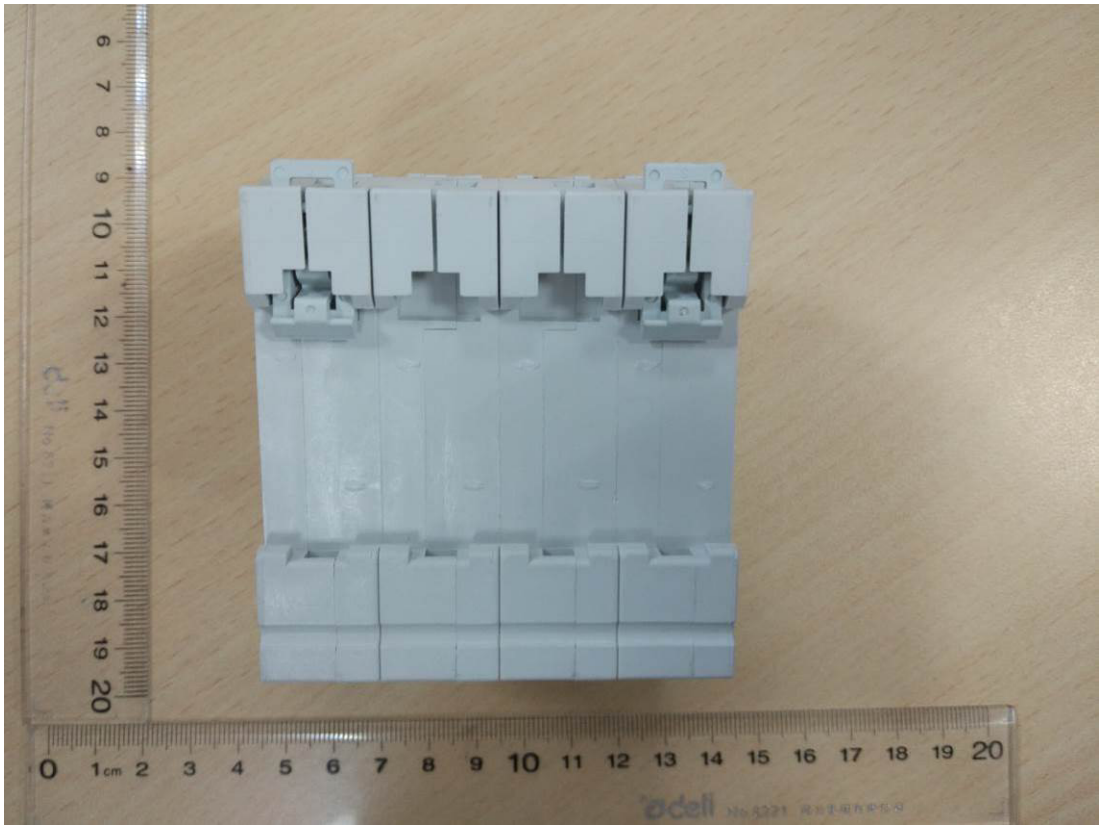
Photograph documentation:
Outer construction of 4P:



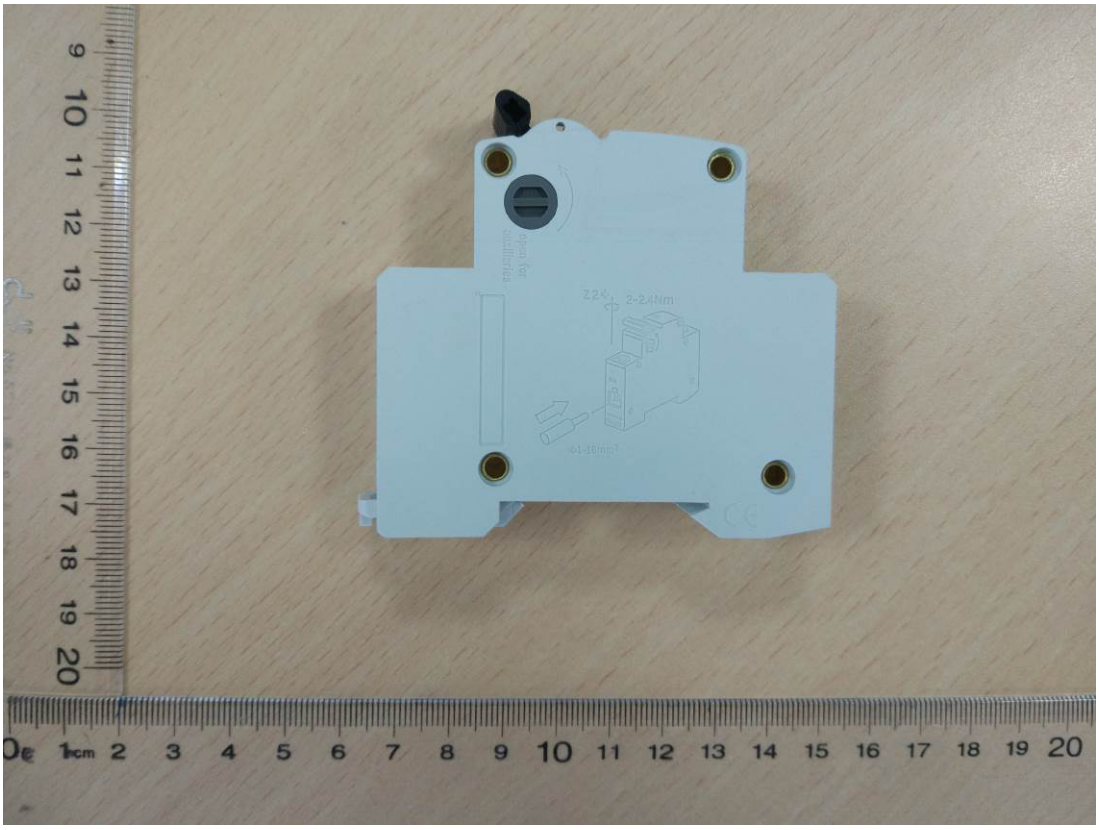


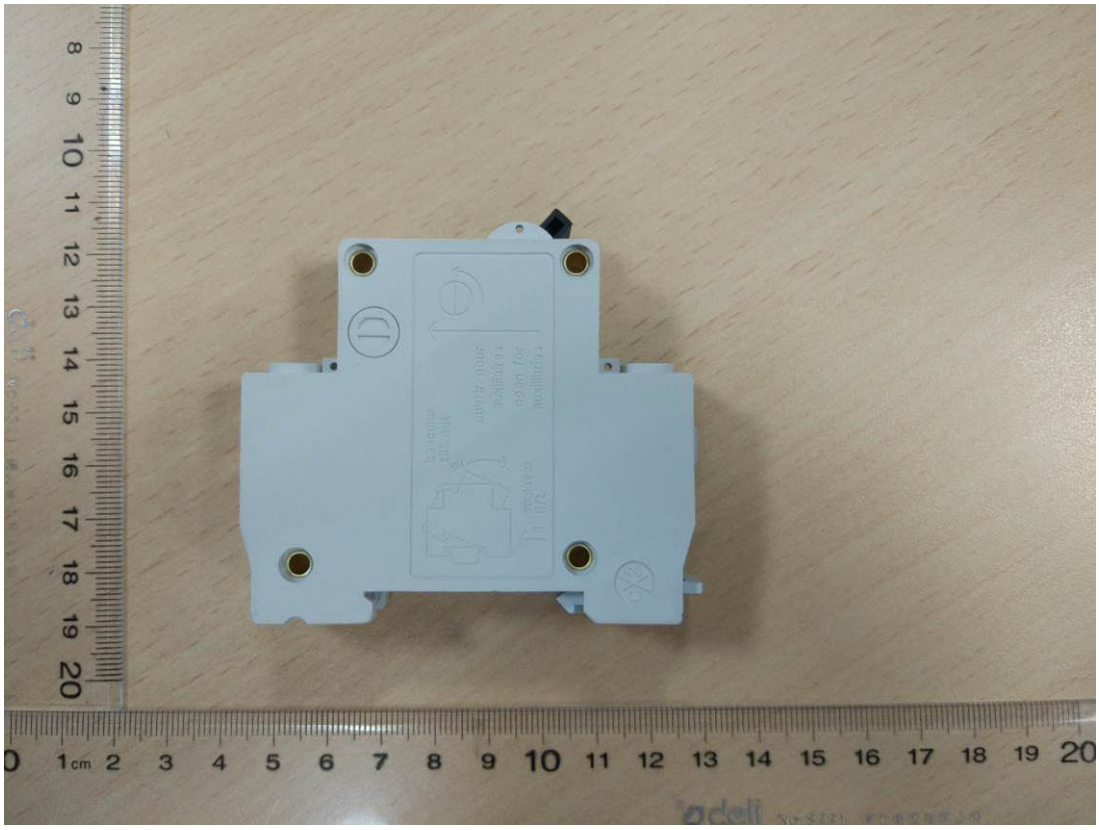


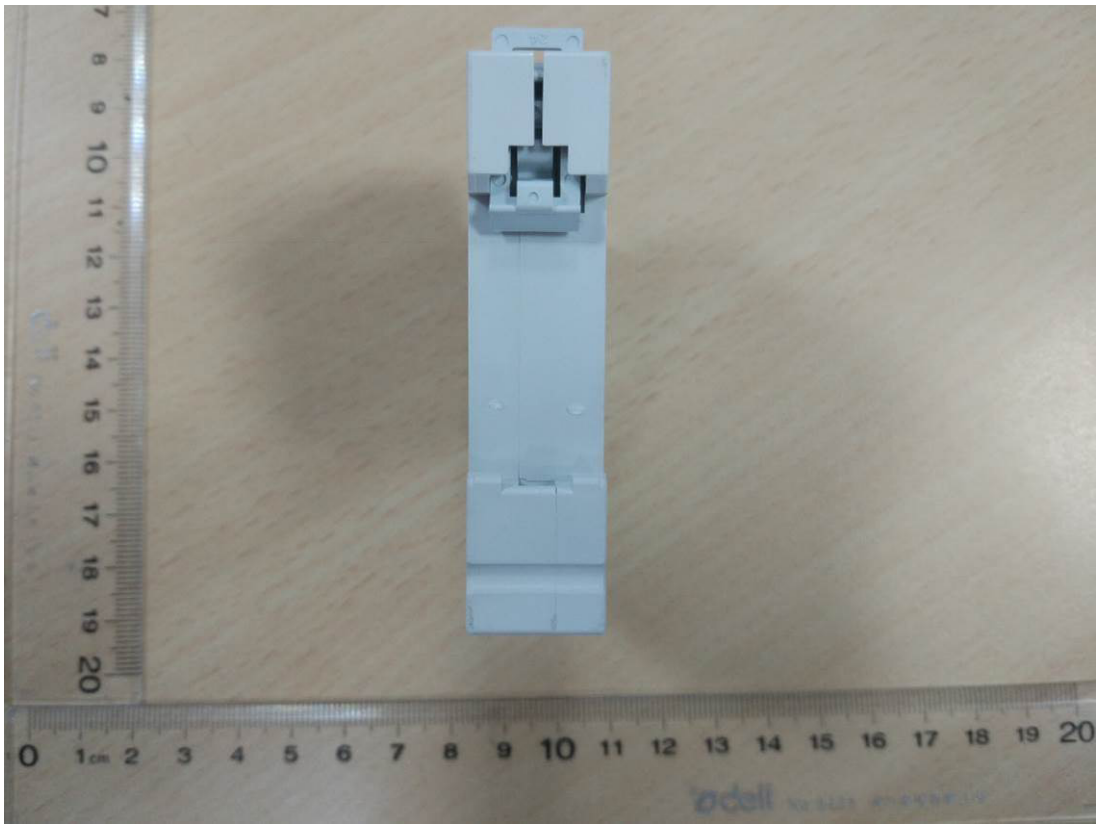

neigenaus
tilt out
aufheben
lift



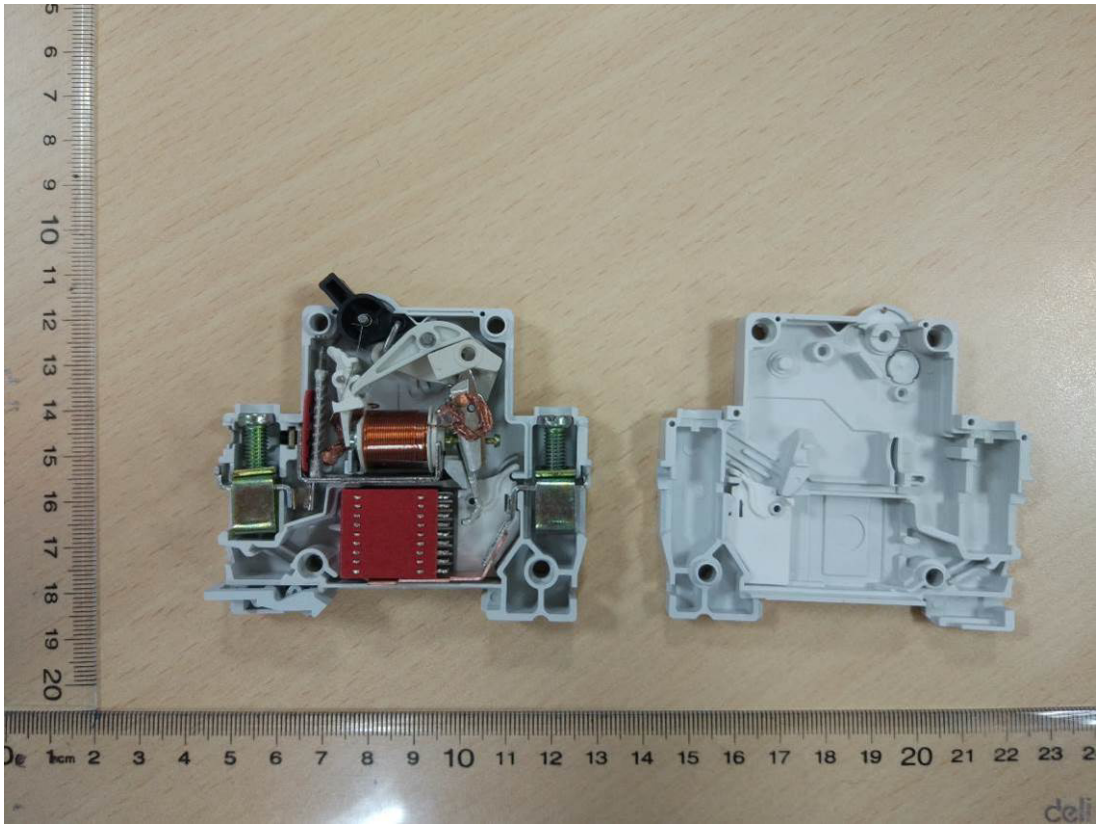
Outer construction of 1P:

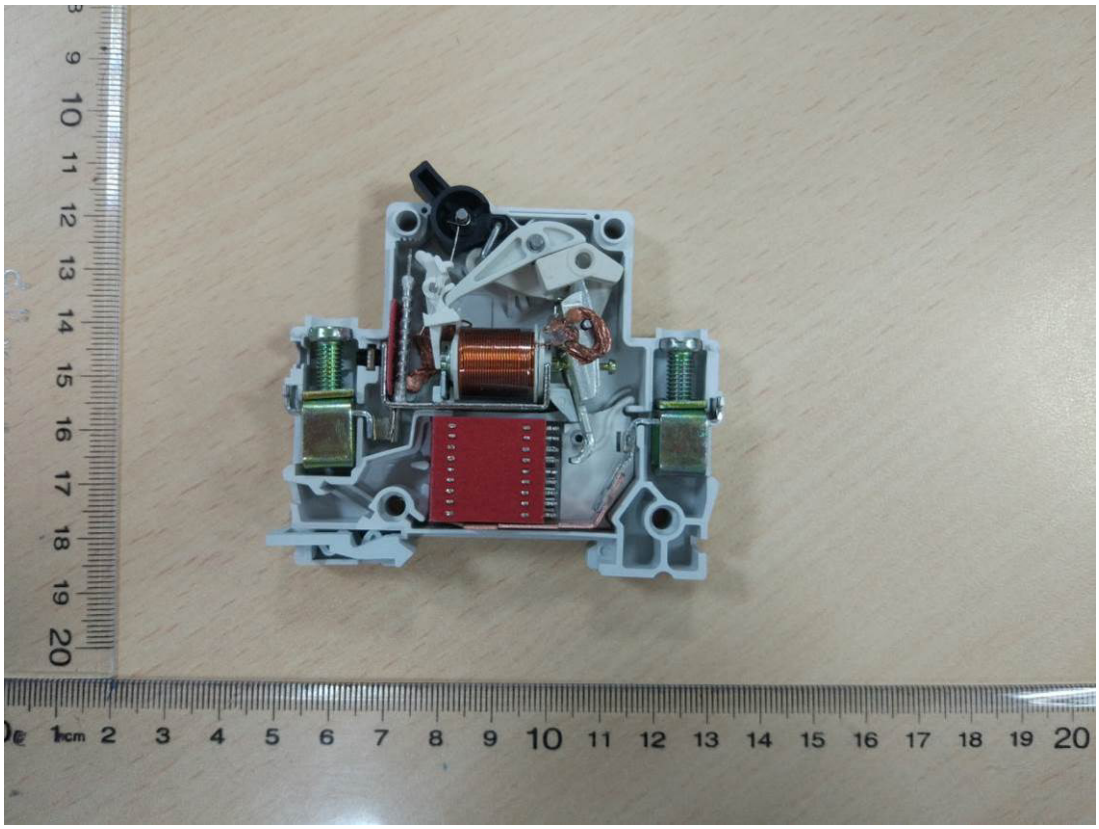


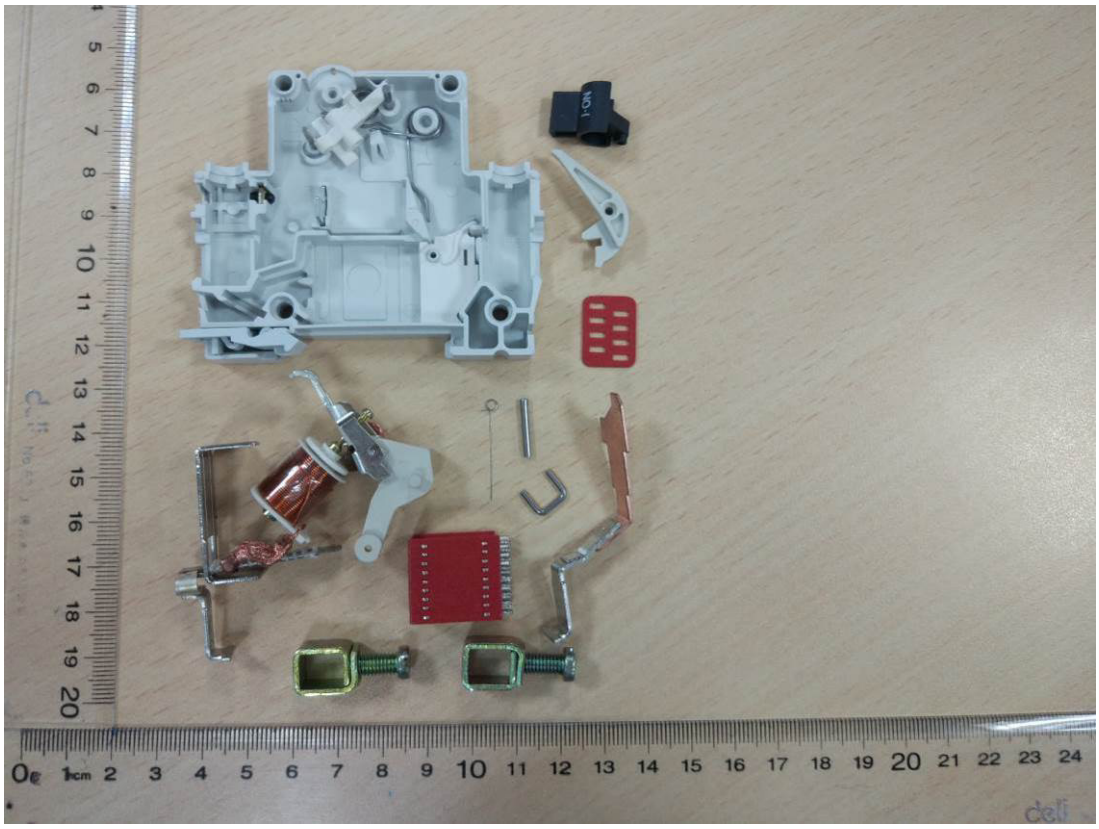




Insider construction of C1:







Insider construction of C63: