Test Report issued under the responsibility of

KEMA

TEST REPORT

EN 60898-1:2003 and / or IEC 60898-1:2002
Circuit-Breakers for overcurrent protection for household and similar installations

Report Reference No. ..... :	W0711002.50
Tested by (name+signature) ..... :	Harry wang Harry wang
Witnessed by (name+signature) ..... :	
Supervised by (name+signature) ..... :	
Approved by (name+signature) ..... :	Eric Wang
Date of issue ..... :	29 May 2008
CB Testing Laboratory ..... :	KEMA Quality Testing Services (Zhejiang)Co.,Ltd
Address ..... :	No.5,Changjiang Road Great Bridge Industrial Park North Baixiang Wenzhou,Zhejiang,325603 P.R.China
Testing location/ procedure ..... :	CBTL ☒ RMT ☐ SMT ☐ WMT ☐ TMP ☐
Testing location ..... :	KEMA Quality Testing Services (Zhejiang)Co.,Ltd
Applicant's name ..... :	HYUNDAI HEAVY INDUSTRIES CO.,LTD
Address ..... :	1 CHEONHA-DONG,DONG-GU ULSAN,KOREA
Manufacturer's Name ..... :	HYUNDAI HEAVY INDUSTRIES CO.,LTD
Address ..... :	1 CHEONHA-DONG,DONG-GU ULSAN,KOREA
Factory ..... :	HYUNDAI HEAVY INDUSTRIES (CHINA) ELECTRIC CO.,LTD
Address ..... :	Lianzhong Avenue,Xinba Scientific Technologic Zone,Yangzhong,Jiangsu,P.R. China
Test specification:	
Standard ..... :	EN 60898-1: 2003 +A1:2004+A11: 2006
	IEC 60898-1: 2002 + Amd. 1:2002+Amd 2:2003
Test procedure ..... :	CB
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IECEN60898_1B
TRF Originator ..... :	KEMA
Master TRF ..... :	2006-03

Test item description .....:	Circuit-breaker for overcurrent protection
Trade Mark .....:	HYUNDAI
Manufacturer .....:	HYUNDAI HEAVY INDUSTRIES CO.,LTD
Model/Type reference .....:	HiBD63
Ratings .....:	Ue: 240 / 415 Vac (1P, 1P+N); Ue: 415 Vac (2P, 3P, 3P+N, 4P); In: 1, 2, 3, 4, 5, 6, 10, 13, 15, 16, 20, 25, 32, 40, 50, 63 A

Test items particulars:	
Type of circuit-breaker	
Number of poles	☒ 1-P ☒ 1-P+N 2-P ☒ 3-P ☒ 3-P+N 4-P ☐ Other ……
Protection against external influences	☐enclosed ☒ unenclosed
Method of mounting	☐surface ☒ flush ☒ panel board / distribution board
Method of connection	☒.not associated with the mechanical mounting ☐ associated with the mechanical mounting
Instantaneous tripping current	☒B ☒ C ☒ D
Ambient air temperature (°C)	☒ 30 °C ☐ 40 °C ☐ Other _____°C
Energy limiting class	☐ Class 1 ☐ Class 2 ☐ Class 3
Rated short-circuit capacity (A)	☐ 1,5 kA ☐ 3 kA ☐ 4,5 kA ☒ 6 kA ☐ 10 kA ☐ 15 kA ☐ 20 kA ☐ 25 kA
Type of terminal	☐ screw [a) b)] ☒ pillar [a) b)] ☐ cage [a) b)] ☐ lug ☐ screw less[)] ☐ flat quick connect [a)] ☐ plug-in ☐ screw-in [a)] copper conductors [b)] aluminium conductors***
Value of rated operational voltage	☐ 120 V ** ☐ 230 V ☐ 240 V ** ☐ 120/240 V ** ☐ 230/400 V ☐ 400 V ☒ 240/415 V ☒ 415 V
Value of rated current	1, 2, 3, 4, 5, 6, 10, 13, 15, 16, 20, 25, 32, 40, 50, 63 A
Value of rated frequency	☒ 50 Hz ☒ 60 Hz
Rated impulse withstand voltage (Uimp)	☐ 2,5 kV** ☒ 4 kV ☐ declared ___kV
Material group and CTI declared by manufacturer	☐ Group I, (600 V ≤ CTI) ☐ Group II, (400 V ≤ CTI < 600 V) ☒ Group IIIa, (175 V ≤ CTI < 400 V)

Test case verdicts:	
Test case does not apply to the test object	N/A
Test item does meet the requirement :	P(ass)
Test item does not meet the requirement	F(ail)
Testing:	
Date of receipt of test item	November 1,2007
Date(s) of performance of test	From November 1,2007 to January 25,2008

General remarks:

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.

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(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 or ☐point is used as the decimal separator.

Remark: ** delete for EN and *** only for EN

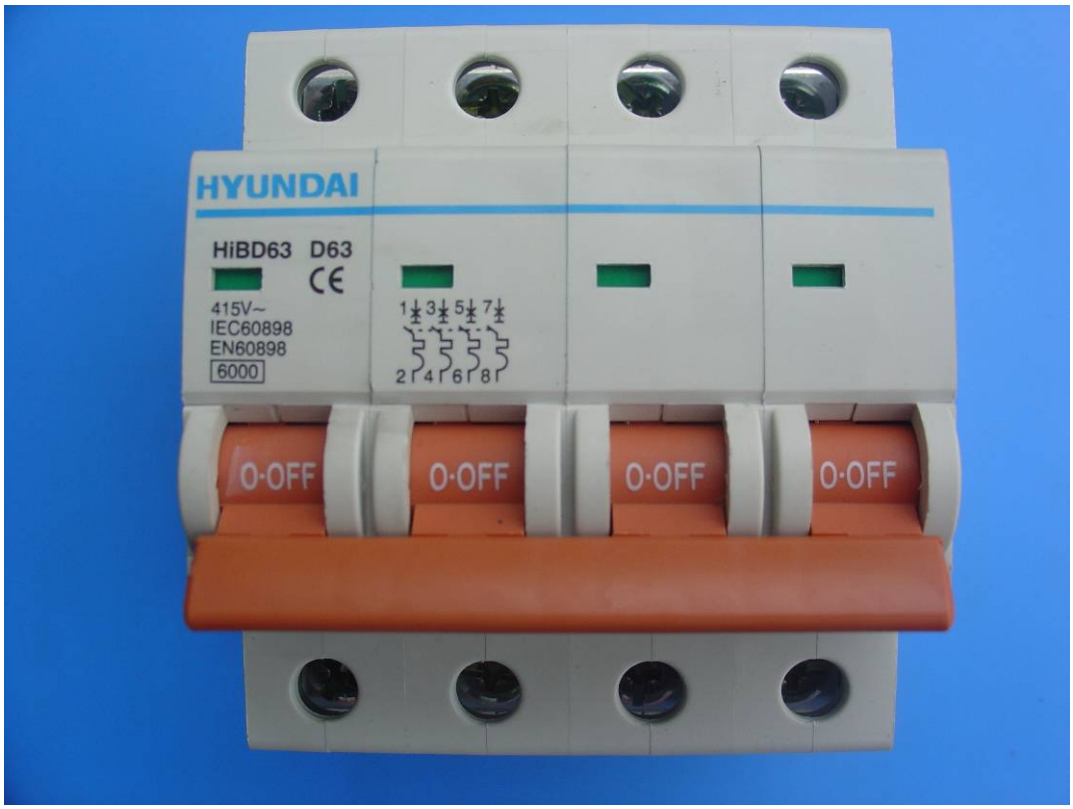
General product information:

Ue: 240 / 415 Vac (1P, 1P+N), 415 Vac (2P, 3P, 3P+N, 4P);
In: 1, 2, 3, 4, 5, 6, 10, 13, 15, 16, 20, 25, 32, 40, 50, 63 A ; B ,C and D Type ;
Ics = Icn: 6000 A

All the samples are without symbols for line / load. The internal constructions for 1P+N and 3P+N are identical to these of 2P and 4P.

Factory Location : HYUNDAI HEAVY INDUSTRIES (CHINA) ELECTRIC CO.,LTD
Lianzhong Avenue,Xinba Scientific Technologic Zone,Yangzhong,Jiangsu,P.R. China

Copy of marking plate



Summary of testing:

Tests performed (name of test and test clause):

Report ref.NO.	NO.of poles	In(A)	Type	TEST SEQUENCE AND NUMBER OF SAMPLES								
				A	B	C1	C2	D1+D1	D0	E1	E2[C]	E3[C]
W0711002	1P	63	D	×-	×-	×-	×-	×-	-	×-	-	-
	1P	50	D	-	-	-	-	-	×[b)]	-	-	-
	1P	40	D	-	-	-	-	-	×[b)]	-	-	-
	1P	32	D	-	-	-	-	-	×[b)]	-	-	-
	1P	25	D	-	-	-	-	-	×[b)]	-	-	-
	1P	20	D	-	-	-	-	-	×[b)]	-	-	-
	1P	16	D	-	-	-	-	-	×[b)]	-	-	-
	1P	15	D	-	-	-	-	-	×[b)]	-	-	-
	1P	13	D	-	-	-	-	-	×[b)]	-	-	-
	1P	10	D	-	-	-	-	-	×[b)]	-	-	-
	1P	6	D	-	-	-	-	-	×[b)]	-	-	-
	1P	5	D	-	-	-	-	-	×[b)]	-	-	-
	1P	4	D	-	-	-	-	-	×[b)]	-	-	-
	1P	3	D	-	-	-	-	-	×[b)]	-	-	-
	1P	2	D	-	-	-	-	-	×[b)]	-	-	-
	1P	1	D	-	-	-	-	-	×[b)]	-	-	-
	1P	63	C,B	-	×[a)]	-	-	-	×[b)]	-	-	-
	1P	50	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	40	C,B	-	--	-	-	-	×[b)]	-	-	-
	1P	32	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	25	C,B	-	-	-	--	-	×[b)]	-	-	-
	1P	20	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	16	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	15	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	13	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	10	C,B	-	-	-	-	-	×[b)]	-	-	
	1P	6	C,B	-	-	-	-	-	-×[b)]	-	-	-
	1P	5	C,B		-	-	-	-	×[b)]	-		-
	1P	4	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	3	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	2	C,B	-	-	-	-	-	×[b)]	-	-	-
	1P	1	C,B	-	-	-	-	-	×[b)]	-	-	-
	4P	63	C,B	-	×[a)]	-	-	-	-	-	-	-

W0711002	2P	63	D	-	-	-	×	-	-	×		-
	2P	1	D	-	-	-	-	-	-	×	-	-
	3P[d)]	--	D	-	-	-	-	-	-	-	-	-
	4P	63	D	×	×	×	×	×	-	×	-	-
	4P	1	D	-	-	-	-	-	-	×	-	-

a):For this test sequence only test of clause 9.8 is required according to table C.4.

b):For this test sequence only test of clause 9.10.2 is required according to table C.4.

C):Test sequence in IEC/EN 60898-1,due to Ics=Icn ,the test sequence is omitted.

d):The tests of three-pole circuit-breakers are omitted when four-pole circuit-breakers have been tested according to IEC/EN 60898-1 Annex C .

REMARKS:

1.Test at service short-circuit capacity (Ics):

For single-pole circuit-breakers of rated voltage 230 / 400V or 240 / 415V, an additional set of three samples is tested in a circuit according to figure 5. During the test the I^2t values need not be measured .

The test procedure is shown as below:

Operation	Samples		
	1	2	3
1	O	O	O
2	--	CO	O
3	O	--	CO
4	CO	O	--

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
6	**MARKING AND OTHER INFORMATION -1 sample D63 ,1P A-1**		
6.1	**Standard marking:**		
	Circuit-breaker marked with:		
	a) Manufacturer's name or trade mark..... :	HYUNDAI	P
	b) Type designation, catalogue number or other identification number..... :	HiBD63	P
	c) Rated voltage (V) ..... :	240 / 415 Vac	P
	d) Rated current (A)..... :	63	P
	e) Rated frequency (Hz)..... :		N/A
	f) Rated short circuit capacity (A):within a rectangle, without symbol "A" ..... :	6000 within a rectangle	P
	g) Wiring diagram		P
	h) Reference air temperature, if different from 30°C		N/A
	i) Degree of protection, if different from IP20		N/A
	j) Energy limiting class in a square in accordance with annex ZA, if applied		N/A
	k) Making and breaking capacity on an individual protected pole of multipole circuit-breakers (Icn1), if different from Icn		N/A
	Symbol for instantaneous tripping current	D	P
	Symbol for nature of supply	~	P
	Marking for rated current and for instantaneous tripping shall be readily visible when CB is installed		P
	Other marking shall be easily discernible		P
	The suitability for isolation, which is provided by all circuit-breakers of this standard, mm be indicated by the symbol on the device	Combined with symbols of other functions	P
	Energy limiting class		N/A
	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 -	OFF: O ON : 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

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	This symbol shall be easily discernible		P
	For CB with multiple current ratings, the maximum value is marked, the adjusted value indicated without ambiguity		N/A
6.2	**Additional marking *** **		N/A
	Additional marking to other standards (EN or IEC or other) is allowed under the follow conditions:		N/A
	- the circuit-breaker shall comply with all the requirements of the additional standard;		N/A
	- 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		N/A
	Compliance is checked by inspection and by carrying out all the test sequences need not be repeated.		N/A
6.3	**Guidance table for marking *** **		
	Each MCB shall be marked in a durable manner with all or, for small apparatus, according table for marking		P

8.	**REQUIREMENTS FOR CONSTRUCTION AND OPERATION**		
8.1.1	**General**		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

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	If the indication is on the actuating means, it shall, when released, automatically take up or stay in the position corresponding to that of the moving contacts; operating means shall have two different rest positions, except that, for automatic operation, a third distinct rest position mm be provided		P
	If a separate mechanical indicator is used to indicate the position of the min contacts, colour red shall be used for the on position and green for the off position.		P
	The action of the mechanism shall not be influenced by the position of enclosures		P
	If the cover is used as a guiding means for push-button, it shall not be possible to remove this button from the outside		N/A
	Operating means securely fixed, not possible to remove them without a tool		P
	For the up-down operating means the contacts shall be closed by the up movement.		P
9.3	**Indelibility of marking**		
	Marking shall be indelible and easily legible (not on removable parts) by rubbing with cotton soaked for 15 s with water and 15 s with hexane		P
8.1.3	**Clearances and creepage distances**		P
8.1.3	**Clearances [mm] see table 4, (for EN take table 4 of EN)**		P
	1.between live parts (of the main circuits) which are separated when the CB is in off position ..... :	≥ 4,5 mm	P
	2.between live parts of different polarity ..... :		N/A
	3.between circuits supplied from different sources, one of which being PELV or SELV ..... :		N/A
	4. Between live parts and		P
	- accessible surfaces of operating means ..... :	≥ 6,9 mm	P
	- screws or other means for fixing covers ..... :		N/A
	- surface on which the base is mounted ..... :	≥ 4,9 mm	P
	- screws or other means for fixing the circuit breaker ..... :		N/A
	- metal covers or boxes ..... :		N/A
	- other accessible metal parts ..... :		N/A
	- metal frames supporting the base (flush-type) . :	≥ 4,8 mm to fixing rail	P
	5.between metal parts of mechanism and:		P
	- accessible metal parts ..... :	≥ 7,0 mm	P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	- screws or other means for fixing the circuit breaker ..... :		N/A
	- metal frames supporting the base (flush type) . :	≥ 4,8 mm to fixing rail	P
8.1.3	**Creepage distances [mm] (see table 4)**		
	Insulating material		P
	Comparative tracking index (CTI) .....:	175 V (50 drops)	P
	Material group .....:	☐ I ☐ II ☒ IIIa	P
	1.between live parts (of the min circuits) which are separated when the CB is in off position ..... :	≥ 4,5 mm	P
	2.between live parts of different polarity ..... :		N/A
	3.between circuits supplied from different sources, one of which being PELV or SELV ..... :		N/A
	4. between live parts and		P
	- accessible surfaces of operating means ..... :	≥ 6,9 mm	P
	- screws or other means for fixing covers..... :		N/A
	- surface on which the base is mounted ..... :	≥ 4,9 mm	P
	- screws or other means for fixing the circuit breaker ..... :		N/A
	- metal covers or boxes ..... :		N/A
	- other accessible metal parts..... :		N/A
	- metal frames supporting the base (flush-type) . :	≥ 4,8 mm to fixing rail	P
Deleted **	5.between metal parts of mechanism and:		P
	- accessible metal parts ..... :	≥ 7,0 mm	P
	- screws or other means for fixing the circuit breaker ..... :		N/A
	- metal frames supporting the base (flush type) . :	≥ 4,8 mm to fixing rail	P
8.1.4	**Screws, current-carrying parts and connections**		P
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use		P
	Screws for mounting of the CB not of the thread-cutting type		P
	Test according to cl. 9.4:		P
	- 10 times (screw Ø / torque Nm)	Ø___mm___Nm (see table 10) Ø___mm___Nm	N/A
	- 5 times (screw Ø / torque Nm)	Ø 5,0 mm 2 Nm (see table 10) Ø___mm___Nm	P
	Plug in connections tested by plugging in and pulling out five times		N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	After test connections have not become loose nor electrical function impaired		P
8.1.4.2	Screws with a thread of insulating material ensured correct introduction		N/A
8.1.4.3	Electrical connection: contact pressure not transmitted through insulating material, unless there is sufficient resilience in the metallic parts		P
	Compliance is checked by inspection		P
8.1.4.4	Current-carrying parts and connections including parts intended for protective conductors, if any, shall be of		P
	- copper		P
	- alloy 58% copper for worked cold parts		N/A
	- alloy 50% copper for other parts		N/A
	- other metal		N/A
	The requirements of this sub clause do not apply to contacts, magnetic circuits, heater elements, bimetals, current limiting materials, shunts, electronic parts including circuit-boards		P
	Compliance is checked by inspection in accordance with manufacturers declaration		P
8.1.5	**Terminals for external conductors**		P
8.1.5.1	Terminals ensure correct connection of conductors (Test acc. to cl. 9.5 or annex J or K)		P
9.5	Torque Ø___mm___Nm Ø___mm___Nm Ø___mm___Nm max. sect. _____ mm²	Ø 5,0 mm 2 Nm	P
9.5.1	Pull test: min sect.__mm² Pull ___ N max sect.__mm² Pull ___ N Pull _____ N for min During the test conductor does not move noticeably	min sect.1,0 mm² Pull 50 N max sect. 25 mm² Pull 100 N N for 1 min	P
9.5.2	min sect.__ ___ mm² Torque (2/3)=___Nm max sect. ____ _mm² The conductor shows no damage	min sect. 1,0 mm² Torque (2/3)=1,33 Nm max sect. 25 mm²	P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
9.5.3	Nominal cross-section from _ to _____ mm² No of wires ___ Ø of wires ____ mm Ø of wires ____ mm Torque (2/3) =___Nm After the test no wire escaped outside	Nominal cross-section from 1,0 to 25 mm² No of wires 7 Ø of wires 0,67 mm Ø of wires 2,14 mm Torque (2/3) =1,33 Nm	P
8.1.5.2	Terminals allow the connection of conductors of the following cross-sectional areas: (table 5)		P
	Rated current (A) / Range of nominal cross sections to be clamped (mm²): ≤ 13: 1 to 2,5 > 13 ≤ 16: 1 to 4 > 16 ≤ 25: 1,5 to 6 > 25 ≤ 32: 2,5 to 10 > 32 ≤ 50: 4 to 16 > 50 ≤ 80: 10 to 25 > 80 ≤ 100: 16 to 35 > 100 ≤ 125: 25 to 50	1-25 mm²	P
	It is required that, for current ratings up to and including 50 A terminals are designed to clamp solid conductors as well as rigid stranded conductors; the use of flexible conductors is permitted		P
	Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm^2 up to 6 mm^2 are designed to clamp solid conductors only.		P
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 9.5.1)		P
8.1.5.6	Clamping of conductor without damage to the conductor (See test of sub-clause 9.5.2)		P
8.1.5.7	Clamping of conductor between metal surfaces (See tests of sub-clause 9.4 and 9.5.1)		P
8.1.5.8	Conductor shall not slip-out when the clamping screw or nuts are tightened (See test of sub-clause 9.5.3)		P

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Cl.	Requirement – Test	Result	Verdict
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
8.1.5.11	Pillar terminals shall allow full insertion and reliable clamping of the conductor. ** and replaced by “Void”		P
	Compliance is checked by inspection after a solid conductor of the largest cross-sectional area specified for the relevant rated current in table 5 has been fully inserted and fully clamped by applying the torques according to table 10 **	cross-sectional area 5,0 mm^2 Torque: 2,0 Nm	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 Compliance is checked by inspection		P
8.1.6	**Non interchangeability**		
	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	**Plug-in type 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
8.1.7.1	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
8.1.7.2	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

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	Unless the live parts are within an internal enclosure of insulating material: Lining - reliably fixed, - adequate thickness and - mechanical strength		N/A
	Inlet openings for cables shall be in insulating material or be provided with bushings or similar devices in insulating material Such device - shall be reliably fixed - shall have adequate mechanical strength		N/A
	For plug-in CB, external parts, other than screws and other means for fixing covers, which are accessible shall be in insulating material		N/A
	Metallic operating means insulated from live parts		N/A
	Metal parts of the mechanism not accessible and insulated from accessible metal parts, metal frames (for flush-type), screws or other means for fixing the base		P
	Replacement of plug-in CB possible without touching live parts		N/A
	Lacquer or enamel not considered		P
9.6	**Test of protection against electric shock**		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-breakers with enclosures of thermoplastic material are additional tested at 35 °C for 1 min with a force of 75 N. In case of knock-outs it is applied with a force of 10 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: 1,5 mm	P

IEC / EN 60898			
Cl.	Requirement – Test	Result	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	Impression: 1,2 mm	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**		
	Glow wire test: No visible flame, no sustained glowing or flames and glowing extinguish within 30 s		P
	External** parts retaining current-carrying parts and parts of the protective circuit in position (960 ± 15)°C	9 s	P
	all other external parts (650 ± 10)°C	11 s	P
8.12	Resistance to rusting		
	Ferrous parts adequately protected against rusting		P
9.16	Test of resistance to rusting:		P
	10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		P
	10 min immersed in a 10% solution of ammonium chloride in water at 20°C		P
	10 min at 95% humidity at 20°C		P
	10 min at 100°C		P
	No sign of rust		P
6	**MARKING AND OTHER INFORMATION - 1 sample D63 ,4P A-2**		
6.1	**Standard marking:**		P
	Circuit-breaker marked with:		P
	a) Manufacturer's name or trade mark..... :	HYUNDAI	P
	b) Type designation, catalogue number or other identification number..... :	HiBD63	P
	c) Rated voltage (V) ..... :	415 V	P
	d) Rated current (A)..... :	63	P
	e) Rated frequency (Hz)..... :		N/A
	f) Rated short circuit capacity (A):within a rectangle, without symbol "A" ..... :	6000 within a rectangle	P
	g) Wiring diagram		P

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Cl.	Requirement – Test	Result	Verdict
	h)Reference air temperature, if different from 30°C		N/A
	i) Degree of protection, if different from IP20		N/A
	j) Energy limiting class in a square in accordance with annex ZA, if applied		N/A
	k) Making and breaking capacity on an individual protected pole of multipole circuit-breakers (Icn1), if different from Icn		N/A
	Symbol for instantaneous tripping current	D	P
	Symbol for nature of supply	~	P
	Marking for rated current and for instantaneous tripping shall be readily visible when CB is installed		P
	Other marking shall be easily discernible		P
	The suitability for isolation, which is provided by all circuit-breakers of this standard, mm be indicated by the symbol on the device	Combined with symbols of other functions	P
	Energy limiting class		N/A
	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 -	OFF: O ON : 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
	This symbol shall be easily discernible		N/A
	For CB with multiple current ratings, the maximum value is marked, the adjusted value indicated without ambiguity		N/A
6.2	**Additional marking *****		N/A
	Additional marking to other standards (EN or IEC or other) is allowed under the follow conditions:		N/A
	- the circuit-breaker shall comply with all the requirements of the additional standard;		N/A
	- 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		N/A

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Cl.	Requirement – Test	Result	Verdict
	Compliance is checked by inspection and by carrying out all the test sequences need not be repeated.		N/A
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

8.	**REQUIREMENTS FOR CONSTRUCTION AND OPERATION**		
8.1.1	**General**		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 mm be provided		P
	If a separate mechanical indicator is used to indicate the position of the min contacts, colour red shall be used for the on position and green for the off position.		P
	The action of the mechanism shall not be influenced by the position of enclosures		N/A
	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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Cl.	Requirement – Test	Result	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
9.3	**Indelibility of marking**		P
	Marking shall be indelible and easily legible (not on removable parts) by rubbing with cotton soaked for 15 s with water and 15 s with hexane		P
8.1.3	**Clearances and creepage distances**		P
8.1.3	**Clearances [mm] see table 4, (for EN take table 4 of EN)**		P
	1.between live parts (of the main circuits) which are separated when the CB is in off position ..... :	≥ 4,5 mm	P
	2.between live parts of different polarity ..... :	≥ 6,9 mm	P
	3.between circuits supplied from different sources, one of which being PELV or SELV ..... :		N/A
	4. Between live parts and		P
	- accessible surfaces of operating means ..... :	≥ 4,8 mm	P
	- screws or other means for fixing covers ..... :		N/A
	- surface on which the base is mounted ..... :	≥ 4.9 mm	P
	- screws or other means for fixing the circuit breaker ..... :		N/A
	- metal covers or boxes ..... :		N/A
	- other accessible metal parts ..... :	≥ 6,9 mm	P
	- metal frames supporting the base (flush-type) . :	≥ 4,8 mm to fixing rail	P
	5.between metal parts of mechanism and:		P
	- accessible metal parts ..... :	≥ 7,0 mm	P
	- screws or other means for fixing the circuit breaker ..... :		N/A
	- metal frames supporting the base (flush type) . :	≥ 4,8 mm to fixing rail	P
8.1.3	**Creepage distances [mm] (see table 4)**		P
	Insulating material		P
	Comparative tracking index (CTI) .....:	175 V (50 drops)	P
	Material group .....:	☐ I ☐ II ☒ IIIa	
	1.between live parts (of the min circuits) which are separated when the CB is in off position ..... :	≥ 4,5 mm	P
	2.between live parts of different polarity ..... :		N/A
	3.between circuits supplied from different sources, one of which being PELV or SELV ..... :		N/A
	4. between live parts and		P

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Cl.	Requirement – Test	Result	Verdict
	- accessible surfaces of operating means ..... :	≥ 6,9 mm	P
	- screws or other means for fixing covers..... :		N/A
	- surface on which the base is mounted..... :	≥ 4.9 mm	P
	- screws or other means for fixing the circuit breaker ..... :		N/A
	- metal covers or boxes ..... :		N/A
	- other accessible metal parts..... :	≥ 6,9 mm	P
	- metal frames supporting the base (flush-type). :	≥ 4,8 mm to fixing rail	P
Deleted **	5.between metal parts of mechanism and:		
	- accessible metal parts ..... :	≥ 7,0 mm	P
	- screws or other means for fixing the circuit breaker..... :		N/A
	- metal frames supporting the base (flush type). :	≥ 4,8 mm to fixing rail	P
8.1.4	**Screws, current-carrying parts and connections**		P
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use		P
	Screws for mounting of the CB not of the thread-cutting type		N/A
	Test according to cl. 9.4:		P
	- 10 times (screw Ø / torque Nm)	Ø___mm___Nm (see table 10) Ø___mm___Nm	N/A
	- 5 times (screw Ø / torque Nm)	Ø 5,0 mm 2 Nm (see table 10) 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		P
	Compliance is checked by inspection		P
8.1.4.4	Current-carrying parts and connections including parts intended for protective conductors, if any, shall be of		
	- copper		P
	- alloy 58% copper for worked cold parts		N/A

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Cl.	Requirement – Test	Result	Verdict
	- alloy 50% copper for other parts		N/A
	- other metal		N/A
	The requirements of this sub clause do not apply to contacts, magnetic circuits, heater elements, bimetals, current limiting materials, shunts, electronic parts including circuit-boards		P
	Compliance is checked by inspection in accordance with manufacturers declaration		P
8.1.5	**Terminals for external conductors**		
8.1.5.1	Terminals ensure correct connection of conductors (Test acc. to cl. 9.5 or annex J or K)		P
9.5	Torque Ø_5,0__mm__2_Nm Ø___mm___Nm Ø___mm___Nm max. sect. _____ mm²		P
9.5.1	Pull test: min sect.1,0 mm² Pull 50 N max sect.25 mm² Pull 100 N Pull _____ N for 1 min During the test conductor does not move noticeably		P
9.5.2	min sect.1,0 __ mm² Torque (2/3)=1,33 Nm max sect. 25 mm^2 The conductor shows no damage		P
9.5.3	Nominal cross-section from 1,0 to 25 mm² No of wires 7 Ø of wires 0,67 mm Ø of wires 2,14 mm Torque (2/3) =1,33Nm After the test no wire 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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Cl.	Requirement – Test	Result	Verdict
	Rated current (A) / Range of nominal cross sections to be clamped (mm²): ≤ 13: 1 to 2,5 > 13 ≤ 16: 1 to 4 > 16 ≤ 25: 1,5 to 6 > 25 ≤ 32: 2,5 to 10 > 32 ≤ 50: 4 to 16 > 50 ≤ 80: 10 to 25 > 80 ≤ 100: 16 to 35 > 100 ≤ 125: 25 to 50	1 - 25 mm²	P
	It is required that, for current ratings up to and including 50 A terminals are designed to clamp solid conductors as well as rigid stranded conductors; the use of flexible conductors is permitted		P
	Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm^2 up to 6 mm^2 are designed to clamp solid conductors only.		P
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 9.5.1)		P
8.1.5.6	Clamping of conductor without damage to the conductor (See test of sub-clause 9.5.2)		P
8.1.5.7	Clamping of conductor between metal surfaces (See tests of sub-clause 9.4 and 9.5.1)		P
8.1.5.8	Conductor shall not slip-out when the clamping screw or nuts are tightened (See test of sub-clause 9.5.3)		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
8.1.5.11	Pillar terminals shall allow full insertion and reliable clamping of the conductor. ** and replaced by “Void”		P

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Cl.	Requirement – Test	Result	Verdict
	Compliance is checked by inspection after a solid conductor of the largest cross-sectional area specified for the relevant rated current in table 5 has been fully inserted and fully clamped by applying the torques according to table 10 **	cross-sectional area 5,0 mm^2 Torque: 2,0 Nm	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 Compliance is checked by inspection		P
8.1.6	**Non interchangeability**		
	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	**Plug-in type 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
8.1.7.1	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
8.1.7.2	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 - reliably fixed, - adequate thickness and - mechanical strength		N/A

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Cl.	Requirement – Test	Result	Verdict
	Inlet openings for cables shall be in insulating material or be provided with bushings or similar devices in insulating material Such device - shall be reliably fixed - shall have adequate mechanical strength		N/A
	For plug-in CB, external parts, other than screws and other means for fixing covers, which are accessible shall be in insulating material		N/A
	Metallic operating means insulated from live parts		N/A
	Metal parts of the mechanism not accessible and insulated from accessible metal parts, metal frames (for flush-type), screws or other means for fixing the base		P
	Replacement of plug-in CB possible without touching live parts		N/A
	Lacquer or enamel not considered		P
9.6	**Test of protection against electric shock**		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-breakers with enclosures of thermoplastic material are additional tested at 35 °C for 1 min with a force of 75 N. In case of knock-outs it is applied with a force of 10 N***		P
8.10	Resistance to heat		
	CB sufficiently resistant to heat		P
9.14	**Test of resistance to heat (see D63 ,1P)**		
9.14.1	Test:		
	- 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: 1,5 mm	P
9.14.3	Ball pressure test for external parts of insulating material (parts not retaining current-carrying parts and parts of the protective circuit in position T = (70 ± 2)°C or T = ___ °C = (40 ± 2)°C + max. temperature rise of sub-clause 9.8 Ø of impression ≤ 2 mm	Impression: 1,2 mm	P

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Cl.	Requirement – Test	Result	Verdict
8.11	Resistance to abnormal heat and to fire		
	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
	Glow wire test: No visible flame, no sustained glowing or flames and glowing extinguish within 30 s		P
	External** parts retaining current-carrying parts and parts of the protective circuit in position (960 ± 15)°C	9 s	P
	all other external parts (650 ± 10)°C	11 s	P
8.12	Resistance to rusting		P
	Ferrous parts adequately protected against rusting		P
9.16	Test of resistance to rusting:		P
	10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		P
	10 min immersed in a 10% solution of ammonium chloride in water at 20°C		P
	10 min at 95% humidity at 20°C		P
	10 min at 100°C		P
	No sign of rust		P

	TESTS „B“- 3 sample D63 ,1P	**B-1 B-2 B-3**	P
8.3	**Dielectric properties and isolating capability**		P
	CB shall have adequate dielectric properties and shall ensure isolation:		P
8.3.1	Dielectric strength at power frequency		
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition		P
8.3.2	Isolating capability		
	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 9.7.6.1 and 9.7.6.3.		P
8.3.3	Dielectric strength at rated impulse withstand voltage (Uimp)		
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2.		P
9.7	**Test of dielectric properties and isolating capability**		P

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Cl.	Requirement – Test	Result			Verdict
9.7.1	Resistance to humidity				P
9.7.1.1	Preparation of the circuit-breaker for test				P
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				P
9.7.1.2	Test conditions				P
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	Rf = 93 % T = 23 °C			P
9.7.1.3	Test procedure:				P
	The sample is kept in the cabinet for 48 h.				P
9.7.1.4	Condition of the circuit-breaker after the test				P
	After this treatment, the sample show no damage within the meaning of this standard and shall withstand the tests of 9.7.2 and 9.7.3				P
9.7.2	Insulation resistance of the main circuit				P
9.7.2	After an interval between 30 min and 60 min following 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	≥ 500 MΩ	≥ 500 MΩ	≥ 500 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	≥ 500 MΩ	≥ 500 MΩ	≥ 500 MΩ	P
Deleted **	d) between metal parts of mechanism and the frame ≥ 5 MΩ	≥ 500 MΩ	≥ 500 MΩ	≥ 500 MΩ	P
d) ***	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 in 9.7.5 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

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Cl.	Requirement – Test	Result	Verdict
Deleted **	d) 2000 V		P
d) ***	e) 2500 V		N/A
9.7.4	Dielectric strength of the auxiliary and control circuits		N/A
	For these tests, the main circuit shall be connected to the frame. The test voltage specified in 9.7.5 shall be applied for 1 min as follows:		N/A
	1) Between all the auxiliary or control circuits and the frame U = ____ V	U = ____ V	N/A
	2) Between each part of the auxiliary or control circuits which mm be isolated from the other parts of the auxiliary or control circuits and these other parts connected together U = [1000 V if Ui ≤ 60 V or 2Ui + 1000 V if Ui > 60 V]	U = ____ V	N/A
9.7.6	Verification of the impulse withstand voltage (across clearances and across solid insulation) and leakage current across open contacts		P
9.7.6.1	Verification of the impulse withstand voltage across open contacts (suitability for isolation)		P
	The 1,2/50µs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum		P
	- rated impulse withstand voltage (kV) :	4 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp on open min contacts (equipment suitable for isolating) (see table 13).....:	6,2 kV	P
	- no unintentional disruptive discharge during the tests		P
9.7.6.2	Verification of impulse withstand voltage for the parts not test in 9.7.6.1		P
	The 1,2/50µs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum		P
	- rated impulse withstand voltage (kV) :	4 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp min circuits (see table 14) :	4,9 kV	P
	Application of test voltage		P
	i) Between all the phase pole(s) connected together and to the neutral pole (or path) of the circuit-breaker		N/A
	ii) Between all the phase pole(s) and the neutral pole(or path) connected together and the metal support connected to the terminals intended for the protective conductor(s)		P
	- no unintentional disruptive discharge during the tests		P

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Cl.	Requirement – Test	Result			Verdict
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)				
	For circuit-breakers suitable for isolation, the leakage current shall be measured. Each pole having been submitted to the test of 9.12.11.2, or 9.12.11.3, or 9.12.11.4.2 or 9.12.11.4.3 is supplied at a test voltage of 1,1 times its rated operational voltage, the circuit-breaker being in the open position				P
	The leakage current flowing across the open contacts is measured and shall not exceed 2 mA				P
8.4	**Temperature rise**				
	Temperature rise does not exceed the limiting values stated in table 6:				P
9.8.2	Test current: I_N= (reach the steady-state value, ≤ 1K/h) Four-pole CB's: 1) three poles loaded 2) one pole and neutral pole loaded	I_N : 63 A			P
	Ambient air temperature ..... :	25 ℃			P
	Temperature rise [K]	[K]	[K]	[K]	
	Terminals for external connections.....60 K				
	L1	41 K	41 K	41 K	P
	L2				N/A
	L3	-	-	-	N/A
	L4 (N)	-	-	-	N/A
	L3	-	-	-	N/A
	N	-	-	-	N/A
	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	12 K	13 K	12 K	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	35 K	33 K	34 K	P
9.8.5	Measurement of power losses				P
	Power losses do not exceed the values stated in table 15				P
	Test current: I_N = 63 A (reach the steady state value) Un ≥ 30 V				P
	Loaded one pole after the other	W	W	W	P

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Cl.	Requirement – Test	Result			Verdict
	Max. power loss: 13 W				P
	L1	7,2 W	6,5 W	6,7 W	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4 (N)	-	-	-	N/A
	L3	-	-	-	N/A
	N	-	-	-	N/A
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 ..... :	23,9° C			P
	Parts..... Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections..... 75				P
	L1	51 K	50 K	52 K	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	L3	-	-	-	N/A
	N	-	-	-	N/A
	The temperature rise does not exceed the value measured during the temperature rise test (subclause 8.8) by more than 15 K				P
	Test current 1,45 I_N =91,4A				P
	- Tripping within	(s)	(s)	(s)	P
	- 1h (≤ 63 A)	393 s	177 s	209 s	P
	- 2h (> 63 A)				N/A

	TESTS „B“- 3 sample D63 ,4P	**B-4**	**B-5**	**B-6**	P
8.3	**Dielectric properties and isolating capability**				P
	CB shall have adequate dielectric properties and shall ensure isolation:				P
8.3.1	Dielectric strength at power frequency				P

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Cl.	Requirement – Test	Result			Verdict
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition				P
8.3.2	Isolating capability				P
	Circuit-breakers shall be suitable for isolation. Compliance is checked by the verification of compliance with the minimum clearances and creepage distances of item 1 of table 4 and by tests of 9.7.6.1 and 9.7.6.3.				P
8.3.3	Dielectric strength at rated impulse withstand voltage (Uimp)				P
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2.				P
9.7	**Test of dielectric properties and isolating capability**				
9.7.1	Resistance to humidity				P
9.7.1.1	Preparation of the circuit-breaker for test				
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				P
9.7.1.2	Test conditions				P
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	Rf = 93 % T = 23 °C			P
9.7.1.3	Test procedure:				P
	The sample is kept in the cabinet for 48 h.				P
9.7.1.4	Condition of the circuit-breaker after the test				P
	After this treatment, the sample show no damage within the meaning of this standard and shall withstand the tests of 9.7.2 and 9.7.3				P
9.7.2	Insulation resistance of the main circuit				P
9.7.2	After an interval between 30 min and 60 min following 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	≥ 500 MΩ	≥ 500 MΩ	≥ 500 MΩ	P
	b) in off-position, between each pole in turn and the others connected together ≥ 2 MΩ	≥ 500 MΩ	≥ 500 MΩ	≥ 500 MΩ	P
	c) in on-position, between all poles connected together and the frame ≥ 5 MΩ	≥ 500 MΩ	≥ 500 MΩ	≥ 500 MΩ	P
Deleted **	d) between metal parts of mechanism and the frame ≥ 5 MΩ	≥ 500 MΩ	≥ 500 MΩ	≥ 500 MΩ	P

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Cl.	Requirement – Test	Result	Verdict
d) ***	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 in 9.7.5 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
Deleted **	d) 2000 V		P
d) ***	e) 2500 V		N/A
9.7.4	Dielectric strength of the auxiliary and control circuits		N/A
	For these tests, the main circuit shall be connected to the frame. The test voltage specified in 9.7.5 shall be applied for 1 min as follows:		N/A
	1) Between all the auxiliary or control circuits and the frame U = ____ V	U = ____ V	N/A
	2) Between each part of the auxiliary or control circuits which mm be isolated from the other parts of the auxiliary or control circuits and these other parts connected together U = [1000 V if Ui ≤ 60 V or 2Ui + 1000 V if Ui > 60 V]	U = ____ V	N/A
9.7.6	Verification of the impulse withstand voltage (across clearances and across solid insulation) and leakage current across open contacts		P
9.7.6.1	Verification of the impulse withstand voltage across open contacts (suitability for isolation)		P
	The 1,2/50µs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum		P
	- rated impulse withstand voltage (kV) :	4 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp on open min contacts (equipment suitable for isolating) (see table 13).....:	6,2 kV	P
	- no unintentional disruptive discharge during the tests		P
9.7.6.2	Verification of impulse withstand voltage for the parts not test in 9.7.6.1		P
	The 1,2/50µs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum		P
	- rated impulse withstand voltage (kV) :	4 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp min circuits (see table 14) :	4,9 kV	P
	Application of test voltage		P

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Cl.	Requirement – Test	Result			Verdict
	i) Between all the phase pole(s) connected together and to the neutral pole (or path) of the circuit-breaker				N/A
	ii) Between all the phase pole(s) and the neutral pole(or path) connected together and the metal support connected to the terminals intended for the protective conductor(s)				P
	- no unintentional disruptive discharge during the tests				P
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)				
	For circuit-breakers suitable for isolation, the leakage current shall be measured. Each pole having been submitted to the test of 9.12.11.2, or 9.12.11.3, or 9.12.11.4.2 or 9.12.11.4.3 is supplied at a test voltage of 1,1 times its rated operational voltage, the circuit-breaker being in the open position				P
	The leakage current flowing across the open contacts is measured and shall not exceed 2 mA	0,1 mA			P
8.4	**Temperature rise**				
	Temperature rise does not exceed the limiting values stated in table 6:				P
9.8.2	Test current: I_N= (reach the steady-state value, ≤ 1K/h) Four-pole CB's: 1) three poles loaded 2) one pole and neutral pole loaded	I_N: 63 A			P
	Ambient air temperature ..... :	23,9 ℃			P
	Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections.....60 K				P
	L1	41 K	43 K	43 K	P
	L2	45 K	47 K	44 K	P
	L3	47 K	48 K	47 K	P
	L4 (N)	45 K	46 K	44 K	P
	L3	46 K	48 K	46 K	P
	N	--	--	--	N/A
	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	14 K	14 K	13 K	P
	External metallic parts of operating means ..25 K	-	-	-	N/A

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Cl.	Requirement – Test	Result			Verdict
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface ..... 60 K	36 K	37 K	35 K	P
9.8.5	Measurement of power losses				P
	Power losses do not exceed the values stated in table 15				P
	Test current: I_N = 63 A (reach the steady state value) Un ≥ 30 V				P
	Loaded one pole after the other	W	W	W	P
	Max. power loss: __13_W	B-4	B-5	B-6	P
	L1	5,2 W	4,8 W	5,7 W	P
	L2	6,3 W	4,5 W	6,0 W	P
	L3	4,9 W	5,2 W	4,8 W	P
	L4 (N)	5,5 W	5,0 W	5,2 W	P
	L3				N/A
	N				N/A
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 ..... :	23,7 ° C			P
	Parts..... Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections..... 75				P
	L1	53 K	53 K	55 K	P
	L2	54 K	60 K	54 K	P
	L3	60 K	55 K	59 K	P
	L4(N)	51 K	54 K	54 K	P
	L3	--	--	--	N/A
	N	--	--	--	N/A
	The temperature rise does not exceed the value measured during the temperature rise test (subclause 8.8) by more than 15 K				P
	Test current 1,45 I_N =91,4 A				P
	- Tripping within	(s)	(s)	(s)	P

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Cl.	Requirement – Test	Result			Verdict
	- 1h (≤ 63 A)	156 s	249 s	327 s	P
	- 2h (> 63 A)	--	--	--	N/A

	TESTS „B“- 3 sample B63 ,1P	**B-7**	**B-8**	**B-9**	P
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:				P
9.8.2	Test current: I_N= (reach the steady-state value, ≤ 1K/h) Four-pole CB‘s: 1) three poles loaded 2) one pole and neutral pole loaded	I_N : 63 A			P
	Ambient air temperature ..... :	25 ℃			P
	Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections.....60 K				P
	L1	37 K	38 K	39 K	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4 (N)	-	-	-	N/A
	L3	-	-	-	N/A
	N	-	-	-	N/A
	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 K	11 K	11 K	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	30 K	30 K	34 K	P
9.8.5	Measurement of power losses				P
	Power losses do not exceed the values stated in table 15				P
	Test current: I_N = 63 A (reach the steady state value) Un ≥ 30 V				P
	Loaded one pole after the other	W	W	W	P
	Max. power loss: 13 W				P
	L1	7,8 W	6,9 W	7,8 W	P
	L2	-	-	-	N/A

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Cl.	Requirement – Test	Result			Verdict
	L3	-	-	-	N/A
	L4 (N)	-	-	-	N/A
	L3	-	-	-	N/A
	N	-	-	-	N/A

	TESTS „B“- 3 sample B63 ,4P	**B-10**	**B-11**	**B-12**	P
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:				P
9.8.2	Test current: I_N= (reach the steady-state value, ≤ 1K/h) Four-pole CB‘s: 1) three poles loaded 2) one pole and neutral pole loaded	I_N : 63 A			P
	Ambient air temperature ..... :	22 ℃			P
	Temperature rise [K]	[K]	[K]	[K]	
	Terminals for external connections.....60 K				
	L1	38 K	39 K	42 K	P
	L2	41 K	39 K	43 K	P
	L3	44 K	43 K	47 K	P
	L4 (N)	41 K	40 K	42 K	P
	L3	47 K	43 K	47 K	P
	N				N/A
	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	13 K	13 K	13 K	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	33 K	33 K	33 K	P
9.8.5	Measurement of power losses				P
	Power losses do not exceed the values stated in table 15				P
	Test current: I_N = 63 A (reach the steady state value) Un ≥ 30 V				P
	Loaded one pole after the other	W	W	W	P
	Max. power loss: 13 W				P

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Cl.	Requirement – Test	Result			Verdict
	L1	4,8 W	4,7 W	4,7 W	P
	L2	5,2 W	4,9 W	4,9 W	P
	L3	4,5 W	5,1 W	5,6 W	P
	L4 (N)	4,9 W	4,8 W	5,1 W	P
	L3	--	--	--	N/A
	N	--	--	--	N/A

	TESTS „B“- 3 sample C63 ,1P	**B-13**	**B-14**	**B-15**	P
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:				P
9.8.2	Test current: I_N= (reach the steady-state value, ≤ 1K/h) Four-pole CB‘s: 1) three poles loaded 2) one pole and neutral pole loaded	I_N: 63 A			P
	Ambient air temperature ..... :	25 ℃			P
	Temperature rise [K]	[K]	[K]	[K]	
	Terminals for external connections.....60 K				
	L1	35 K	36 K	38 K	P
	L2	--	--	--	N/A
	L3	--	--	--	N/A
	L4 (N)	--	--	--	N/A
	L3	--	--	--	N/A
	N	--	--	--	N/A
	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 K	11 K	11 K	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	29 K	30 K	31 K	P
9.8.5	Measurement of power losses				
	Power losses do not exceed the values stated in table 15				P
	Test current: I_N = 63 A (reach the steady state value) Un ≥ 30 V				P

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Cl.	Requirement – Test	Result			Verdict
	Loaded one pole after the other	W	W	W	P
	Max. power loss: 13 W				P
	L1	5,8 W	5,6 W	4,9 W	P
	L2	--	--	--	N/A
	L3	--	--	--	N/A
	L4 (N)	--	--	--	N/A
	L3	--	--	--	N/A
	N	--	--	--	N/A

	TESTS „B“- 3 sample C63 ,4P	**B-16**	**B-17**	**B-18**	P
8.4	**Temperature rise**				P
	Temperature rise does not exceed the limiting values stated in table 6:				P
9.8.2	Test current: I_N= (reach the steady-state value, ≤ 1K/h) Four-pole CB‘s: 1) three poles loaded 2) one pole and neutral pole loaded	I_N : 63 A			P
	Ambient air temperature ..... :	25 ℃			P
	Temperature rise [K]	[K]	[K]	[K]	P
	Terminals for external connections.....60 K				P
	L1	43 K	42 K	41 K	P
	L2	46 K	45 K	47 K	P
	L3	48 K	49 K	49 K	P
	L4 (N)	42 K	42 K	40 K	P
	L3	46 K	45 K	49 K	P
	N				N/A
	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	15 K	15 K	14 K	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	37 K	37 K	38 K	P
9.8.5	Measurement of power losses				
	Power losses do not exceed the values stated in table 15				P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	Test current: I_N = 63 A (reach the steady state value) Un ≥ 30 V				P
	Loaded one pole after the other	W	W	W	P
	Max. power loss: 13 W				P
	L1	4,6 W	4,5 W	4,9 W	P
	L2	4,9 W	4,7 W	5,2 W	P
	L3	5,2 W	5,1 W	4,7 W	P
	L4 (N)	5,0 W	4,9 W	5,0 W	P
	L3				N/A
	N				N/A

	TESTS „C“ 3 samples D63 ,1P	**C1-1**	**C1-2-**	**C1-3**	
8.7	**Mechanical and electrical endurance**				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 240 V (rated voltage) Test Current 63 A (rated current) Power factor :(0,85-0,9) Par. resistor _____ Ohm Cross sect. area 16 mm² Remark: single pole CBs of 230/400 V tested at 230 V***	243,5 V 64,6 A 0,88			P
9.11.2	**Test procedure**				P
	The circuit-breaker is submitted to 4000 operating cycles with rated current.	4000 cycles			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
	CBs with dependent manual operation the operating speed shall be 0,1 m/s ± 25 %				P
	During the test the circuit-breaker shall be operated as in normal use.				P
9.11.3	**Condition of the circuit-breaker after the test**				
	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

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	- 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_A	161 A			P
	Opening time not less 1 s or more than	[s]	[s]	[s]	
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	27 s	32 s	21 s	P
	Dielectric strength reduced to according 9.7.3 but at a voltage 500 V less than prescribed in 9.7.5** or 900 V***	Test voltage 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			P
	- 500 A or 10 In	634,9 A			P
	Test voltage 1,05 Un** or 1,1 Un***	253,5 V			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
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	1,17 kA			P
	Sequence: 6 x "O" and 3 x "CO"	[kA^2s]	[kA^2s]	[kA^2s]	P
	Max. I^2t (kA^2s)	9,22	8,63	9,06	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:				P
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 without maintenance, withstand the following tests.				P

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Cl.	Requirement – Test	Result			Verdict
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= _456,5_V. The circuit – breaker is in the open position	C1-1 (mA)	C1-2 (mA)	C1-3 (mA)	P
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	TESTS „C“ 3 samples D63 ,4P	**C1-4**	**C1-5**	**C1-6**	
8.7	**Mechanical and electrical endurance**				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 415 V (rated voltage) Test Current 63 A (rated current) Power factor :(0,85-0,9) Par. resistor _____ Ohm Cross sect. area 16 mm² Remark: single pole CBs of 230/400 V tested at 230 V***	415,5 Vac 64,4 A 0,85			P
9.11.2	**Test procedure**				P
	The circuit-breaker is submitted to 4000 operating cycles with rated current.	4000 cycles			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
	CBs with dependent manual operation the operating speed shall be 0,1 m/s ± 25 %				P
	During the test the circuit-breaker shall be operated as in normal use.				P
9.11.3	**Condition of the circuit-breaker after the test**				P
	Following the test 9.11.2 the sample shall not show:				P

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Cl.	Requirement – Test	Result			Verdict
	- 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_A	161 A			P
	Opening time not less 1 s or more than	[s]	[s]	[s]	P
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	27 s	35 s	33 s	P
	Dielectric strength reduced to according 9.7.3 but at a voltage 500 V less than prescribed in 9.7.5** or 900 V***	Test voltage 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			P
	- 500 A or 10 In	634,9 A			P
	Test voltage 1,05 Un** or 1,1 Un***	253,5 V			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
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	1231 A			P
	Sequence: 6 x "O" and 3 x "CO"	[kA^2s]	[kA^2s]	[kA^2s]	P
	Max. I^2t (kA^2s)	8,41	27,4	9,14	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:				P

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Cl.	Requirement – Test	Result			Verdict
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 without 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.= 456,5 V. The circuit – breaker is in the open position	C1-4 (mA)	C1-5 (mA)	C1-6 (mA)	P
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	0,1 mA	0,1 mA	0,1 mA	P
	L3	0,1 mA	0,1 mA	0,1 mA	P
	L4(N)	0,1 mA	0,1 mA	0,1 mA	P
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	TESTS „C“ 3 samples D63 ,1P	**C2-1**	**C2-2-**	**C2-3**	
9.12.11.2.2	**Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems**				P
	Test current:	Obtained			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 Itripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A	1549 A			P
	Test voltage 1,05 Un** or 1,1 Un***	448 V			P
	Power factor 0,93-0,98	0,94			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
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	1961 A			P
	Sequence: "O" + "CO" on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	P
	Shifted point 30 ° on the other protected pole				P

IEC / EN 60898						
Cl.	Requirement – Test		Result			Verdict
	Max. I^2t (_kA^2s)	L1 L2 L3 L4	14,8	14,9	14,3	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:					P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 456.6 V. The circuit – breaker is in the open position		C2-1 (mA)	C2-2 (mA)	C2-3 (mA)	P
	The leakage current shall not exceed 2 mA	L1	0,1 mA	0,1 mA	0,1 mA	P
		L2				N/A
		L3				N/A
		L4(N)				N/A
	Electric strength test:					P
	Test voltage 1500 V (see 8.7.2)					P
	a)					P
	b)					N/A
	c)					P
Deleted **	d)					P
d)***	e) 2000 V					N/A
	TESTS „C“ 2 samples D63 ,2P		**C2-4**	**C2-5**	**---**	P
9.12.11.2.2	**Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems**					P
	Test current:		Obtained			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 Itripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A		1549,9 A			P
	Test voltage 1,05 Un** or 1,1 Un***		448 V			P
	Power factor 0,93-0,98		0,94			P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
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
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	1945 A			P
	Sequence: "O" + "CO" on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	P
	Shifted point 30 ° on the other protected pole			--	P
	Max. I^2t (kA^2s) L1	14,3	17,2	---	P
	L2	15,0	12,3		
	L3	----	---		
	L4	----	---		
	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:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 456,5 V. The circuit – breaker is in the open position	(mA)	(mA)	--	P
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	--	P
	L2	0,1 mA	0,1 mA	---	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P
Deleted **	d)				P
d)***	e) 2000 V				N/A
	TESTS „C" 1 samples D63 ,4P	**C2-6**			P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
9.12.11.2.2	**Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems**				P
	Test current:	Obtained			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 Itripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A	1549,9 A			P
	Test voltage 1,05 Un** or 1,1 Un***	448 V			P
	Power factor 0,93-0,98	0,94			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
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	1932 A			P
	Sequence: "O" + "CO" on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	P
	Shifted point 30 ° on the other protected pole	--	C2-6	--	P
	Max. I^2t (kA^2s) L1	___	14,6	___	P
	L2	___	13,6	___	
	L3	___	14,3	___	
	L4	___	12,8	___	
	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:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 456,6 V. The circuit – breaker is in the open position	(mA)	(mA)	(mA)	P
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	0,1 mA	0,1 mA	0,1 mA	P
	L3	0,1 mA	0,1 mA	0,1 mA	P
	L4(N)	0,1 mA	0,1 mA	0,1 mA	P
	Electric strength test:				P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	Test voltage 1500 V (see 8.7.2)		P
	a)		P
	b)		P
	c)		P
Deleted **	d)		P
d)***	e) 2000 V		N/A

	TESTS „D“ 3 samples D63 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0 -1**	**D0 -2**	**D0 -3**	P
	I_N	63 A			P
	Sect. (mm²)	16 mm^2			P
	Symbol for instantaneous tripping current	D			P
9.10.1	Test of time-current characteristic				P
9.10.1.1	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	[s]	[s]	[s]	P
	1h (≤ 63 A)	781 s	442 s	213 s	P
	2h (> 63 A)				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	160,7 A			P
	opening time not less than 1 s or more than	[s]	[s]	[s]	P
	60 s				N/A
	120 s	104 s	71 s	48 s	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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Cl.	Requirement – Test	Result	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		N/A
	Test current $3I_N$ (A), starting from cold	_____ A	N/A
	Opening time:	[s] [s] [s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***		N/A
	Test current 5 I_N (A), starting from cold	_____ A	N/A
	Tripping less than:	[s] [s] [s]	N/A
	0,1 s		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A	N/A
	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.3	☐ For circuit-breakers of the C – Type		N/A
	Test current $5I_N$ (A), starting from cold	_____ A	N/A
	Opening time:	[s] [s] [s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***		N/A
	Test current 10 I_N (A), starting from cold	_____ A	N/A
	Tripping less than 0,1 s	[s] [s] [s]	N/A
			N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A	N/A
	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4	☒ For circuit-breakers of the D – Type		P
	Test current $10I_N$ (A), starting from cold	630 A	P
	Opening time:	[s] [s] [s]	P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***		N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	- 0,1s ≤ t ≤ 8s (> 32A)***	1,9 s	2,2 s	1,5 s	P
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	1260 A			P
	Tripping less than 0,1 s	[ms]	[ms]	[ms]	P
		25	31	19	P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	160,7 A			P
	opening time not less than 1 s or more than	[s]	[s]	[s]	P
	- 60 s				N/A
	- 120 s	104 s	71 s	48 s	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-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	119,7 A			P
	Tripping within	[s]	[s]	[s]	P
	- 1 h (I_N ≤ 63 A)	647 s	203 s	77 s	P
	- 2 h (I_N > 63 A)				N/A
	b) Ambient temperature of (40 ± 2)°C				P
	Test current I_N (A)	63 A			P
	No tripping within				P
	- 1h	No tripping			P
	- 2h				N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	Tests: D1-3 samples D63 1P	**D1-1 D1-2 D1-3**	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
9.13.2.1	All types:		P
	- Impact test: 10 blows-height 10 cm, no damage		P
9.13.2.2	Screw-in types:		N/A
	- Torque 2,5 Nm for 1 min, no damage		N/A
9.13.2.3	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
9.13.2.4	Plug-in types		N/A
	The circuit-breaker are mounted in there 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 17).		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 (k A)	1,55 kA	P
	Power factor	0,97	P
	Test voltage 1,05 Un** or 1,1 Un ***	254 V	P
	Test circuit: figure	Figure 3	P
	t (min)	3 min	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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Cl.	Requirement – Test	Result			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
	Sequence	6-O,2C-O,1-O			P
	I_{Peak} (A) max. value	$2{,}13 \times 10^3$ A			P
	$I^2t \leq 16{,}0\ kA^2s$	[kA^2s]	[kA^2s]	[kA^2s]	P
	Max. I^2t (kA^2s) L1	16,0	15,7	15,5	P
	L2	---	---	----	
	L3	---	----	----	
	..... N	--	----	----	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 456,6V. The circuit – breaker is in the open position	(mA)	(mA)	(mA)	P
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
Deleted **	d)				P
d) ***	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	100,5 A			P

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Cl.	Requirement – Test	Result			Verdict
		[s]	[s]	[s]	P
	Tripping within ☒ 1 hour / ☐ 2 hour	49 s	87 s	53 s	P

	TESTS „D“ 3 samples D63 4P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0 -4**	**D0 -5**	**D0 -6**	P
	I_N	63 A			P
	Sect. (mm²)	16 mm^2			P
	Symbol for instantaneous tripping current	D			P
9.10.1	Test of time-current characteristic				P
9.10.1.1	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)	160,7 A			P
	- Tripping within	[s]	[s]	[s]	P
	1h (≤ 63 A)	224 s	154 s	145 s	P
	2h (> 63 A)				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	160,7 A			P
	opening time not less than 1 s or more than	[s]	[s]	[s]	P
	60 s	--	--	--	N/A
	120 s	92 s	93 s	65 s	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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Cl.	Requirement – Test	Result			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
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	630 A			P
	Opening time:	[s]	[s]	[s]	P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***				N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***	2,6 s	4,5 s	3,7 s	P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	1260 A			P
	Tripping less than 0,1 s	[ms]	[ms]	[ms]	P
		53	37	29	P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	160,7 A			P
	opening time not less than 1 s or more than	[s]	[s]	[s]	P
	- 60 s	--	--	--	N/A
	- 120 s	58 s	49 s	51 s	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				P
	Test current 1,1 It (A), (two pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	109,2 A			P
	Tripping within	[s]	[s]	[s]	P
	Tripping within				P
	- 1h	D0 -4	D0 -5	D0 -6	P
	L1	139 s	103 s	97s	
	L2	87s	135 s	58 s	
	L3	49s	51 s	162 s	
	L4(N)	100 s	198s	110s	
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C			P
	Test current 1,13 I_N (A)	71,2A			P
	- Passed for 1h	No tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	119,7 A			P
	Tripping within	[s]	[s]	[s]	P
	- 1 h ($I_N \leq 63$ A)	77 s	74 s	61 s	P
	- 2 h ($I_N > 63$ A)				N/A
	b) Ambient temperature of (40 ± 2)°C				P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	Test current I_N (A)	63 A			P
	No tripping within				P
	- 1 h ($I_N \leq 63$ A)	No tripping			P
	- 2 h ($I_N > 63$ A)				N/A
	Tests: D1	**D1-4**	**D1-5**	**D1-6**	
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
9.13.2.1	All types:				P
	- Impact test: 10 blows-height 10 cm, no damage				P
9.13.2.2	Screw-in types:				N/A
	- Torque 2,5 Nm for 1 min, no damage				N/A
9.13.2.3	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
9.13.2.4	Plug-in types				N/A
	The circuit-breaker are mounted in there 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 17).				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)	$1{,}53\times10^3$ A			P
	Power factor	0,95			P
	Test voltage 1,05 Un** or 1,1 Un ***	435,5 V			P
	Test circuit: figure	Figure 6			P
	t (min)	3 min			P

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Cl.	Requirement – Test	Result			Verdict
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
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
	Sequence	6-O,3-CO			P
	I_{Peak} (A) max. value	$2{,}11\times10^3$ A			P
	$I^2t \leq 16{,}5$ kA^{2}s	[kA^{2}s]	[kA^{2}s]	[kA^{2}s]	P
	Max. I^2t (kA^{2}s) L1	15,9	16,5	16,1	P
	L2	14,9	12,6	15,1	P
	L3	13,3	11,9	14,1	P
	..... N	--	--	--	N/A
		D1-7	D1-8	D1-9	
	Sequence	6O + 3CO 3 additional samples due to no N marked. Using successively each pole as neutral in turn.			P
	I_{Peak} (A) max. value	$2{,}11\times10^3$ A			P
	$I^2t \leq 15{,}2$ kA^{2}s	[kA^{2}s]	[kA^{2}s]	[kA^{2}s]	P
	Max. I^2t (kA^{2}s)	D1-7	D1-8	D1-9	P
	L1		12,5	12,9	P
	L2	13,2		15,1	P
	L3	14,9	15,2		P
	L4	13,9	11,2	12,5	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:	D1-4	D1-5	D1-6	P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.				P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 456,5 V. The circuit – breaker is in the open position	(mA)	(mA)	(mA)	P
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	0,1 mA	0,1 mA	0,1 mA	P
	L3	0,1 mA	0,1 mA	0,1 mA	P
	L4(N)	0,1 mA	0,1 mA	0,1 mA	P
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 I_N)	60,5 A			P
	- Passed for 1h	no tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5 A			P
		[s]	[s]	[s]	P
	Tripping within ☒ 1 hour / ☐ 2 hour	35 s	29 s	105 s	P
	After the test:	D1-7	D1-8	D1-9	P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 456,5 V. The circuit – breaker is in the open position	(mA)	(mA)	(mA)	P
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	0,1 mA	0,1 mA	0,1 mA	P
	L3	0,1 mA	0,1 mA	0,1 mA	P
	L4(N)	0,1 mA	0,1 mA	0,1 mA	P
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P

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Cl.	Requirement – Test	Result			Verdict
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 I_N)	60,5 A			P
	- Passed for 1h	no tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5 A			P
		[s]	[s]	[s]	P
	Tripping within ☒ 1 hour / ☐ 2 hour	105 s	57 s	133 s	P

	TESTS „D“ 1 samples D1 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-7**			P
	I_N	1 A			P
	Sect. (mm²)	1 mm^2			P
	Symbol for instantaneous tripping current	D			P
9.10.1	Test of time-current characteristic				P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	1,13 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)	1,45 A			P
	- Tripping within	[s]			P
	1h ($\leq$ 63 A)	77 s			P
	2h (> 63 A)				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	2,55 A			P
	opening time not less than 1 s or more than	[s]			P
	60 s	42 s			P
	120 s				N/A

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Cl.	Requirement – Test	Result				Verdict
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
	Test current $3I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***					N/A
	Test current 5 I_N (A), starting from cold	_____ A				N/A
	Tripping less than:	[s]	[s]	[s]		N/A
	0,1 s					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.3	☐ For circuit-breakers of the C – Type					N/A
	Test current $5I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	_____ A				N/A
	Tripping less than 0,1 s	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

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Cl.	Requirement – Test	Result			Verdict
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	10 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	3,1 s			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	20 A			P
	Tripping less than 0,1 s	[ms]			P
		31 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	2,55 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	27 s			P
	- 120 s				N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	A			N/A
	Tripping within	[s]			N/A
	- 1h				N/A
	- 2h				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C			P
	Test current 1,13 I_N (A)	1,13 A			P
	- Passed for 1h	No tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	1,9 A			P
	Tripping within	[s]			P
	- 1 h (I_N ≤ 63 A)	83 s			P
	- 2 h (I_N > 63 A)				N/A
	b) Ambient temperature of (40 ± 2)°C				P

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Cl.	Requirement – Test	Result	Verdict
	Test current I_N (A)	1,0 A	P
	No tripping within		P
	- 1h		P
	- 2h		N/A

	TESTS „D“ 1 samples D2 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0- 8**	P
	I_N	2 A	P
	Sect. (mm²)	1 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	2,26 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)	2,9 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	164 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	5,1 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	34 s	P
	120 s		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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Cl.	Requirement – Test	Result				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
	Test current $3I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***					N/A
	Test current 5 I_N (A), starting from cold	_____ A				N/A
	Tripping less than:	[s]	[s]	[s]		N/A
	0,1 s					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.3	☐ For circuit-breakers of the C – Type					N/A
	Test current $5I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	_____ A				N/A
	Tripping less than 0,1 s	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.4	☒ For circuit-breakers of the D – Type					P
	Test current $10I_N$ (A), starting from cold	20 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	3,9 s				P
	- 0,1s ≤ t ≤ 8s (> 32A)***					N/A

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Cl.	Requirement – Test	Result			Verdict
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	40 A			P
	Tripping less than 0,1 s	[ms]			P
		44 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	5,1 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	32 s			P
	- 120 s				N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5°C			P
	Test current 1,13 I_N (A)	2,26 A			P
	- Passed for 1h	No tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	3,8 A			P
	Tripping within	[s]			P
	- 1 h ($I_N \leq 63$ A)	153 s			P
	- 2 h ($I_N > 63$ A)				N/A
	b) Ambient temperature of (40 ± 2)°C				P
	Test current I_N (A)	2 A			P
	No tripping within				P
	- 1h				P
	- 2h				N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 1 samples D3 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0- 9**	P
	I_N	3 A	P
	Sect. (mm²)	1 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	3,39 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)	4,35 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	199	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	7,65 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	57	P
	120 s		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

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Cl.	Requirement – Test	Result			Verdict
	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
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	30 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,7 s			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	60 A			P
	Tripping less than 0,1 s	[ms]			P
		18 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	7,65 A			P

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Cl.	Requirement – Test	Result				Verdict
	opening time not less than 1 s or more than	[s]				P
	- 60 s	49 s				P
	- 120 s					N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:					N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A				N/A
	Tripping within	[s]	[s]	[s]		N/A
	- 1h					N/A
	- 2h					N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A				N/A
	Tripping within	[s]	[s]	[s]		N/A
	- 1h					N/A
	- 2h					N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics					P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C				P
	Test current 1,13 I_N (A)	3,39 A				P
	- Passed for 1h	No tripping				P
	- Passed for 2h					N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	5,7 A				P
	Tripping within	[s]				P
	- 1 h ($I_N \leq 63$ A)	201 s				P
	- 2 h ($I_N > 63$ A)					N/A
	- 1 h ($I_N \leq 63$ A)					P
	- 2 h ($I_N > 63$ A)					N/A
	b) Ambient temperature of (40 ± 2)°C					P
	Test current I_N (A)	3 A				P
	No tripping within					P
	- 1h					P
	- 2h					N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 3 samples D4 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0- 10**	P
	I_N	4 A	P
	Sect. (mm²)	1 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	4,52 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	5,8 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	199 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	10,2 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	36 s	P
	120 s		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

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Cl.	Requirement – Test	Result			Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	40 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,5 s			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	80 A			P
	Tripping less than 0,1 s	[ms]			P
		56 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	10,2 A			P
	opening time not less than 1 s or more than	[s]			P

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Cl.	Requirement – Test	Result	Verdict
	- 60 s	35 s	P
	- 120 s		N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:		N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5°C	P
	Test current 1,13 I_N (A)	4,52 A	P
	- Passed for 1h	No tripping	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	7,6 A	P
	Tripping within	[s]	P
	- 1 h ($I_N \leq 63$ A)	74 s	P
	- 2 h ($I_N > 63$ A)		N/A
	b) Ambient temperature of (40 ± 2)°C		P
	Test current I_N (A)	4 A	P
	No tripping within		P
	- 1h		P
	- 2h		N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 3 samples D5 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0 -11**	P
	I_N	5 A	P
	Sect. (mm²)	1 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	5,65 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)	7,25 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	76 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	12,8 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	31 s	P
	120 s		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

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	50 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,9 s			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	100 A			P
	Tripping less than 0,1 s	[s]			P
		11 s			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	12,8 A			P
	opening time not less than 1 s or more than	[s]			P

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Cl.	Requirement – Test	Result				Verdict
	- 60 s	30 s				P
	- 120 s					N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:					N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A				N/A
	Tripping within	[s]	[s]	[s]		N/A
	- 1h					N/A
	- 2h					N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A				N/A
	Tripping within	[s]	[s]	[s]		N/A
	- 1h					N/A
	- 2h					N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics					P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C				P
	Test current 1,13 I_N (A)	5,65 A				P
	- Passed for 1h	No tripping				P
	- Passed for 2h					N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	9,5 A				P
	Tripping within	[s]				P
	- 1 h ($I_N \leq 63$ A)	104 s				P
	- 2 h ($I_N > 63$ A)					N/A
	b) Ambient temperature of (40 ± 2)°C					P
	Test current I_N (A)	5 A				P
	No tripping within					P
	- 1h					P
	- 2h					N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 1 samples D6 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0 -12**	P
	I_N	6 A	P
	Sect. (mm²)	1,0 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	6,78 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	8,7 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	79 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	15,3 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	26 s	P
	120 s		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		
	After each operation the indicating means shall show the open position of the contacts		P

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Cl.	Requirement – Test	Result			Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	60 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,3 s			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	120 A			P
	Tripping less than 0,1 s	[ms]			P
		33 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	15,3 A			P
	opening time not less than 1 s or more than	[s]			P

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Cl.	Requirement – Test	Result	Verdict
	- 60 s	25 s	P
	- 120 s		N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:		N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C	P
	Test current 1,13 I_N (A)	6,78 A	P
	- Passed for 1h	No tripping	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	11,4 A	P
	Tripping within	[s]	P
	- 1 h ($I_N \leq 63$ A)	57 s	P
	- 2 h ($I_N > 63$ A)		N/A
	b) Ambient temperature of (40 ± 2)°C		P
	Test current I_N (A)	6 A	P
	No tripping within		P
	- 1h		P
	- 2h		N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 3 samples D10 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0 -13**	P
	I_N	10 A	P
	Sect. (mm²)	1,5 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	11,3 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	14,5 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	191 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	25,5 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	46 s	P
	120 s		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

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Cl.	Requirement – Test	Result				Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type					N/A
	Test current $3I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***					N/A
	Test current 5 I_N (A), starting from cold	_____ A				N/A
	Tripping less than:	[s]	[s]	[s]		N/A
	0,1 s					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.3	☐ For circuit-breakers of the C – Type					N/A
	Test current $5I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	_____ A				N/A
	Tripping less than 0,1 s	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.4	☒ For circuit-breakers of the D – Type					P
	Test current $10I_N$ (A), starting from cold	100 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	3,2 s				P
	- 0,1s ≤ t ≤ 8s (> 32A)***					N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	200 A				P
	Tripping less than 0,1 s	[ms]				P
		41 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	25,5 A				P

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Cl.	Requirement – Test	Result	Verdict
	opening time not less than 1 s or more than	[s]	P
	- 60 s	46 s	P
	- 120 s		P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:		N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5°C	P
	Test current 1,13 I_N (A)	11,3A	P
	- Passed for 1h	No tripping	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	19 A	P
	Tripping within	[s]	P
	- 1 h ($I_N \leq 63$ A)	149 s	P
	- 2 h ($I_N > 63$ A)		N/A
	b) Ambient temperature of (40 ± 2)°C		P
	Test current I_N (A)	10 A	P
	No tripping within		P
	- 1h	No tripping	P
	- 2h		N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 1 samples D13 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0 -14**	P
	I_N	13 A	P
	Sect. (mm²)	2,5 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	14,7 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	18,9 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	37 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	33,2 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	29 s	P
	120 s		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

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Cl.	Requirement – Test	Result			Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	130 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,8 s			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	260 A			P
	Tripping less than 0,1 s	[ms]			P
		66 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	33,2 A			P
	opening time not less than 1 s or more than	[s]			P

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Cl.	Requirement – Test	Result			Verdict
	- 60 s	27 s			P
	- 120 s				N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5°C			P
	Test current 1,13 I_N (A)	14,7A			P
	- Passed for 1h	No tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	24,7 A			P
	Tripping within	[s]			P
	- 1 h ($I_N \leq 63$ A)	43 s			P
	- 2 h ($I_N > 63$ A)				N/A
	b) Ambient temperature of (40 ± 2)°C				P
	Test current I_N (A)	13 A			P
	No tripping within				P
	- 1h	No tripping			P
	- 2h				N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 1 samples D15 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0- 15**	P
	I_N	15 A	P
	Sect. (mm²)	2,5 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	16,9 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	21,8 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	66 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	38,3 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	21 s	P
	120 s		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

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Cl.	Requirement – Test	Result			Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	150 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	3,3			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	300 A			P
	Tripping less than 0,1 s	[ms]			P
		47 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	38,3 A			P
	opening time not less than 1 s or more than	[s]			P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	- 60 s	20 s				P
	- 120 s					N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:					N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A				N/A
	Tripping within	[s]	[s]	[s]		N/A
	- 1h					N/A
	- 2h					N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A				N/A
	Tripping within	[s]	[s]	[s]		N/A
	- 1h					N/A
	- 2h					N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics					P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C				P
	Test current 1,13 I_N (A)	16,9 A				P
	- Passed for 1h	No tripping				P
	- Passed for 2h					N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	28,5 A				P
	Tripping within	[s]				P
	- 1 h ($I_N \leq 63$ A)	71 s				P
	- 2 h ($I_N > 63$ A)					N/A
	b) Ambient temperature of (40 ± 2)°C					P
	Test current I_N (A)	15 A				P
	No tripping within					P
	- 1h	No tripping				P
	- 2h					N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 1 samples D16 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0- 16**	P
	I_N	16 A	P
	Sect. (mm²)	2,5 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	18,1 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	23,2 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	86 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	40,8 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	43 s	P
	120 s		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

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Cl.	Requirement – Test	Result			Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	160 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,7			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	320 A			P
	Tripping less than 0,1 s	[ms]			P
		24 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	40,8 A			P
	opening time not less than 1 s or more than	[s]			P

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Cl.	Requirement – Test	Result			Verdict
	- 60 s	42 s			P
	- 120 s				N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C			P
	Test current 1,13 I_N (A)	18,1 A			P
	- Passed for 1h	No tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	30,4 A			P
	Tripping within	[s]			P
	- 1 h ($I_N \leq 63$ A)	20 s			P
	- 2 h ($I_N > 63$ A)				N/A
	b) Ambient temperature of (40 ± 2)°C				P
	Test current I_N (A)	16 A			P
	No tripping within				P
	- 1h	No tripping			P
	- 2h				N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ -1 samples D20 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0- 17**	P
	I_N	20 A	P
	Sect. (mm²)	2,5 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	22,6 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	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 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	67 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	51 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	27 s	P
	120 s		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

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Cl.	Requirement – Test	Result				Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type					N/A
	Test current $3I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***					N/A
	Test current 5 I_N (A), starting from cold	_____ A				N/A
	Tripping less than:	[s]	[s]	[s]		N/A
	0,1 s					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.3	☐ For circuit-breakers of the C – Type					N/A
	Test current $5I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	_____ A				N/A
	Tripping less than 0,1 s	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.4	☒ For circuit-breakers of the D – Type					P
	Test current $10I_N$ (A), starting from cold	200 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,5 s				P
	- 0,1s ≤ t ≤ 8s (> 32A)***					N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	400 A				P
	Tripping less than 0,1 s	[ms]				P
		31 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	51 A				P
	opening time not less than 1 s or more than	[s]				

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Cl.	Requirement – Test	Result	Verdict
	- 60 s	25 s	P
	- 120 s		N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:		N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5°C	P
	Test current 1,13 I_N (A)	22,6 A	P
	- Passed for 1h	No tripping	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	38 A	P
	Tripping within	[s]	P
	- 1 h ($I_N \leq 63$ A)	47 s	P
	- 2 h ($I_N > 63$ A)		N/A
	b) Ambient temperature of (40 ± 2)°C		P
	Test current I_N (A)	20 A	P
	No tripping within		P
	- 1h	No tripping	P
	- 2h		N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ -1 samples D25 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0- 18**	P
	I_N	25 A	P
	Sect. (mm²)	4,0 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	28,3 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	36,3 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	33 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	63,8 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	31 s	P
	120 s		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

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Cl.	Requirement – Test	Result				Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type					N/A
	Test current $3I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***					N/A
	Test current 5 I_N (A), starting from cold	_____ A				N/A
	Tripping less than:	[s]	[s]	[s]		N/A
	0,1 s					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.3	☐ For circuit-breakers of the C – Type					N/A
	Test current $5I_N$ (A), starting from cold	_____ A				N/A
	Opening time:	[s]	[s]	[s]		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	_____ A				N/A
	Tripping less than 0,1 s	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A
9.10.2.4	☒ For circuit-breakers of the D – Type					P
	Test current $10I_N$ (A), starting from cold	250 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,1 s				P
	- 0,1s ≤ t ≤ 8s (> 32A)***					N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	500 A				P
	Tripping less than 0,1 s	[ms]				P
		49 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	63,8 A				P
	opening time not less than 1 s or more than	[s]				P

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Cl.	Requirement – Test	Result	Verdict
	- 60 s	29 s	P
	- 120 s		N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:		N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A	N/A
	Tripping within	[s] [s] [s]	N/A
	- 1h		N/A
	- 2h		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	T =-5 °C	P
	Test current 1,13 I_N (A)	28,8 A	P
	- Passed for 1h	No tripping	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	47,5 A	P
	Tripping within	[s]	P
	- 1 h ($I_N \leq 63$ A)	57 s	P
	- 2 h ($I_N > 63$ A)		N/A
	b) Ambient temperature of (40 ± 2)°C		P
	Test current I_N (A)	25 A	P
	No tripping within		P
	- 1h	No tripping	P
	- 2h		N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS "D" -1 samples D32 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0 -19**	P
	I_N	32 A	P
	Sect. (mm²)	6 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	36,2 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	46,4 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	73 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	81,6 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s	24 s	P
	120 s		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

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Cl.	Requirement – Test	Result			Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	320 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***	2,1 s			P
	- 0,1s ≤ t ≤ 8s (> 32A)***				N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	640 A			P
	Tripping less than 0,1 s	[ms]			P
		26 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	81,6 A			P
	opening time not less than 1 s or more than	[s]			P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	- 60 s	23 s				P
	- 120 s					N/A
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:					N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A				N/A
	Tripping within	[s]	[s]	[s]		N/A
	- 1h					N/A
	- 2h					N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A				N/A
	Tripping within	[s]	[s]	[s]		N/A
	- 1h					N/A
	- 2h					N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics					P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C				P
	Test current 1,13 I_N (A)	36,2 A				P
	- Passed for 1h	No tripping				P
	- Passed for 2h					N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	60,8 A				P
	Tripping within	[s]				P
	- 1 h ($I_N \leq 63$ A)	81 s				P
	- 2 h ($I_N > 63$ A)					N/A
	b) Ambient temperature of (40 ± 2)°C					P
	Test current I_N (A)	32 A				P
	No tripping within					P
	- 1h	No tripping				P
	- 2h					N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ -1 samples D40 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0 -20**	**P**
	I_N	40 A	P
	Sect. (mm²)	10 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	45,2 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	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 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	66 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	102 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s		N/A
	120 s	23 s	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

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	_____ A			N/A
	Tripping less than:	[s]	[s]	[s]	N/A
	0,1 s				N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	☐ For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold	_____ A			N/A
	Opening time:	[s]	[s]	[s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	_____ A			N/A
	Tripping less than 0,1 s	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.4	☒ For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	400 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***				N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***	1,5 s			P
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	800 A			P
	Tripping less than 0,1 s	[ms]			P
		8 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	102 A			P
	opening time not less than 1 s or more than	[s]			P

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Cl.	Requirement – Test	Result			Verdict
	- 60 s				N/A
	- 120 s	23 s			P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C			P
	Test current 1,13 I_N (A)	45,2 A			P
	- Passed for 1h	No tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	76 A			P
	Tripping within	[s]			P
	- 1 h ($I_N \leq 63$ A)	66 s			P
	- 2 h ($I_N > 63$ A)				N/A
	b) Ambient temperature of (40 ± 2)°C				P
	Test current I_N (A)	40 A			P
	No tripping within				P
	- 1h	No tripping			P
	- 2h				N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ -1 samples D50 1P		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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***		P
9.10	**Tests: DO**	**D0 -21**	P
	I_N	50 A	P
	Sect. (mm²)	10 mm^2	P
	Symbol for instantaneous tripping current	D	P
9.10.1	Test of time-current characteristic		P
9.10.1.1	Test current 1,13 I_N (A) starting from cold for:	56,5 A	P
	- 1 h ($I_N \leq 63$ A)	No tripping	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	72,5 A	P
	- Tripping within	[s]	P
	1h (≤ 63 A)	56 s	P
	2h (> 63 A)		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	127,5 A	P
	opening time not less than 1 s or more than	[s]	P
	60 s		N/A
	120 s	21 s	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

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Cl.	Requirement – Test	Result	Verdict
9.10.2.2	☐ For circuit-breakers of the B – Type		N/A
	Test current $3I_N$ (A), starting from cold	_____ A	N/A
	Opening time:	[s] [s] [s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***		N/A
	Test current 5 I_N (A), starting from cold	_____ A	N/A
	Tripping less than:	[s] [s] [s]	N/A
	0,1 s		N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A	N/A
	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.3	☐ For circuit-breakers of the C – Type		N/A
	Test current $5I_N$ (A), starting from cold	_____ A	N/A
	Opening time:	[s] [s] [s]	N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***		N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***		N/A
	Test current 10 I_N (A), starting from cold	_____ A	N/A
	Tripping less than 0,1 s	[s] [s] [s]	N/A
			N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	_____ A	N/A
	opening time not less than 1 s or more than	[s] [s] [s]	N/A
	- 60 s		N/A
	- 120 s		N/A
9.10.2.4	☒ For circuit-breakers of the D – Type		P
	Test current $10I_N$ (A), starting from cold	500 A	P
	Opening time:	[s]	P
	- 0,1 s ** / 0,1s ≤ t ≤ 4s (≤ 32A)***		N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***	7,0 s	P
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j)**, starting from cold	1000 A	P
	Tripping less than 0,1 s	[ms]	P
		25 ms	P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	127,5 A	P
	opening time not less than 1 s or more than	[s]	P

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Cl.	Requirement – Test	Result			Verdict
	- 60 s				N/A
	- 120 s	20 s			P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A
	Test current 1,1 It (A), (two pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	_____ A			N/A
	Tripping within	[s]	[s]	[s]	N/A
	- 1h				N/A
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C			P
	Test current 1,13 I_N (A)	56,5 A			P
	- Passed for 1h	No tripping			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	95 A			P
	Tripping within	[s]			P
	- 1 h ($I_N \leq 63$ A)	43 s			P
	- 2 h ($I_N > 63$ A)				N/A
	b) Ambient temperature of (40 ± 2)°C				P
	Test current I_N (A)	50 A			P
	No tripping within				P
	- 1h	No tripping			P
	- 2h				N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B1 and C1 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0 -22**	**D0 -23**	**-----**	P
	I_N	1 A			P
	Sect. (mm²)	1,0 mm^2			P
	Instantaneous tripping current	☒ B	☒ C	☐ D	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				
	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
	Test current $3I_N$ (A), starting from cold	3,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	10,3 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	5,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	5,1 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	2,55 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	27 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

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Cl.	Requirement – Test	Result			Verdict
	Test current $5I_N$ (A), starting from cold	5,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	5,56 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	10,0 A			P
	Tripping less than 0,1 s	[ms]			P
		97 m			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	2,55 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	40 s			P
	- 120 s				N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***				N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***				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	[s]	[s]	[s]	N/A
					N/A

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Cl.	Requirement – Test	Result				Verdict
	TESTS „D“ 2 samples B2 and C2 ,1P					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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***					P
9.10	**Tests: DO**	**D0- 24**	**D0- 25**	**----**		P
	I_N	2 A				P
	Sect. (mm²)	1 mm^2				P
	Instantaneous tripping current	☒B	☒C	☐D		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
	Test current $3I_N$ (A), starting from cold	6,0 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	16,6 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***					N/A
	Test current 5 I_N (A), starting from cold	10,0 A				P
	Tripping less than:	[ms]				P
	0,1 s	46 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	5,1 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	20 s				P
	- 120 s					N/A
9.10.2.3	☒ For circuit-breakers of the C – Type					P

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Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	10 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	7,24 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	20 A				P
	Tripping less than 0,1 s	[ms]				P
		82 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	5,1 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	35 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B3 and C3, 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0- 26**	**D0-27**	**-----**	P
	I_N	3 A			P
	Sect. (mm²)	1 mm^2			P
	Instantaneous tripping current	☒B	☒C	☐D	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
	Test current $3I_N$ (A), starting from cold	9,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	16,2 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	15,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	61 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	7,65 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	25 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	15,0 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	5,17 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	30,0 A				P
	Tripping less than 0,1 s	[ms]				P
		90 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	7,65 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	48,8 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B4 and C4 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0- 27**	**D0-28**	**-----**	P
	I_N	4 A			P
	Sect. (mm²)	1,0 mm^2			P
	Instantaneous tripping current	☒B	☒C	☐D	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
	Test current $3I_N$ (A), starting from cold	12,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	17,9 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	20,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	32 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	10,2 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	20 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	20,0 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	5,17 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	40,0 A				P
	Tripping less than 0,1 s	[ms]				P
		73 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	10,2 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	34 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B5 and C5 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-29**	**D0- 30**	**-----**	P
	I_N	5 A			P
	Sect. (mm²)	1,0 mm^2			P
	Instantaneous tripping current	☒B	☒C	☐D	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
	Test current $3I_N$ (A), starting from cold	15,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	5,69 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	25,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	27 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	12,8 A			P
	opening time not less than 1 s or more than	[s]			PP
	- 60 s	17 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	Test current $5I_N$ (A), starting from cold	25,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	2,47 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***				N/A
	Test current 10 I_N (A), starting from cold	50,0 A			P
	Tripping less than 0,1 s	[ms]			P
		81 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	12,8 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	33 s			P
	- 120 s				N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***				N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***				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	[s]	[s]	[s]	N/A
					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B6 and C6 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0- 31**	**D0-32**	**-----**	P
	I_N	6 A			P
	Sect. (mm²)	1 mm^2			P
	Instantaneous tripping current	☒B	☒C	☐D	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
	Test current $3I_N$ (A), starting from cold	18,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	9,33 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	30,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	25 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	15,3 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	19 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	30,0 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	2,69 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	60 A				P
	Tripping less than 0,1 s	[ms]				P
		76 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	15,3 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	27 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B10 and C10 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-33**	**D0-34**	**-----**	P
	I_N	10 A			P
	Sect. (mm²)	1,5 mm²			P
	Instantaneous tripping current	☒B	☒C	☐D	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
	Test current $3I_N$ (A), starting from cold	30,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	8,33 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	50,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	31 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	25,5 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	23 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	50,0 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	2,78 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	100 A				P
	Tripping less than 0,1 s	[ms]				P
		78 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	25,5 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	41 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B13 and C13 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0- 35**	**D0-36**	**------**	P
	I_N	13 A			P
	Sect. (mm²)	2,5 mm^2			P
	Instantaneous tripping current	☒B	☒C	☐D	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
	Test current $3I_N$ (A), starting from cold	39,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	6,76 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	65,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	27 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	33,2 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	18 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	65 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	1,92 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	130 A				P
	Tripping less than 0,1 s	[ms]				P
		65 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	33,2 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	29 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B15 and C15 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-37**	**D0- 38**	**------**	**P**
	I_N	15 A			P
	Sect. (mm²)	2,5 mm^2			P
	Instantaneous tripping current	☒B	☒C	☐D	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
	Test current $3I_N$ (A), starting from cold	45,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	6,85 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	75,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	18 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	38,3 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	16 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	75 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	1,92 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	150 A				P
	Tripping less than 0,1 s	[ms]				P
		72 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	38,3 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	18 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B16 and C16 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-39**	**D0- 40**	**-----**	P
	I_N	16 A			P
	Sect. (mm²)	2,5 mm^2			P
	Instantaneous tripping current	☒B	☒ C	☐D	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
	Test current $3I_N$ (A), starting from cold	48,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	6,14 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	80,0 A			P
	Tripping less than:	[ms]			P
	0,1 s	21 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	40,8 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	19 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	80,0 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	1,85 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	160 A				P
	Tripping less than 0,1 s	[ms]				P
		86 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	40,8 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	42 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B20 and C20 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-41**	**D0-42**	**----**	P
	I_N	20 A			P
	Sect. (mm²)	2,5 mm^2			P
	Instantaneous tripping current	☒B	☒ C	☐D	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
	Test current $3I_N$ (A), starting from cold	60,0 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	6,04 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	100 A			P
	Tripping less than:	[ms]			P
	0,1 s	19 s			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	51,0 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	23 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	100 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	2,31 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	200 A				P
	Tripping less than 0,1 s	[ms]				P
		81 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	51,0 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	25 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B25 and C25 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-43**	**D0-44**	**----**	P
	I_N	25 A			P
	Sect. (mm²)	4,0 mm^2			P
	Instantaneous tripping current	☒B	☒ C	☐D	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
	Test current $3I_N$ (A), starting from cold	75 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	3,47 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	125 A			P
	Tripping less than:	[ms]			P
	0,1 s	27 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	63,8 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	29 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	125 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	2,32 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	250 A				P
	Tripping less than 0,1 s	[ms]				P
		8 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	63,8 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	31 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B32 and C32 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-45**	**D0- 46**	**---**	**P**
	I_N	32 A			P
	Sect. (mm²)	6,0 mm^2			P
	Instantaneous tripping current	☒B	☒ C	☐D	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
	Test current $3I_N$ (A), starting from cold	96 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***	7,48 s			P
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***				N/A
	Test current 5 I_N (A), starting from cold	160 A			P
	Tripping less than:	[ms]			P
	0,1 s	20 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	81,6 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	20 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	160 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***	2,67 s				P
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***					N/A
	Test current 10 I_N (A), starting from cold	320 A				P
	Tripping less than 0,1 s	[ms]				P
		81 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	81,6 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	23 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B40 and C40 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-47**	**D0-48**	**----**	**P**
	I_N	40 A			P
	Sect. (mm²)	10 mm^2			P
	Instantaneous tripping current	☒B	☒ C	☐D	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
	Test current $3I_N$ (A), starting from cold	120 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***	10,0 s			P
	Test current 5 I_N (A), starting from cold	200 A			P
	Tripping less than:	[ms]			P
	0,1 s	19 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	102 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	23 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	200 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***	1,89 s				P
	Test current 10 I_N (A), starting from cold	400 A				P
	Tripping less than 0,1 s	[ms]				P
		91 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	102 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	22 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B50 and C50 , 1P				P
8.6	**Automatic operation**				P
8.6.1	Standard time-current zone				--
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.				P
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-49**	**D0-50**	**---**	**P**
	I_N	50 A			P
	Sect. (mm²)	10 mm^2			P
	Instantaneous tripping current	☒B	☒ C	☐D	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
	Test current $3I_N$ (A), starting from cold	150 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***	41,9 s			P
	Test current 5 I_N (A), starting from cold	250 A			P
	Tripping less than:	[ms]			P
	0,1 s	20 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	127,5 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s	25 s			P
	- 120 s				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	Test current $5I_N$ (A), starting from cold	250 A				P
	Opening time:	[s]				P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***					N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***	11,8 s				P
	Test current 10 I_N (A), starting from cold	500 A				P
	Tripping less than 0,1 s	[ms]				P
		52 ms				P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	127,5 A				P
	opening time not less than 1 s or more than	[s]				P
	- 60 s	23 s				P
	- 120 s					N/A
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***					N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***					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	[s]	[s]	[s]		N/A
						N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A				N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]		N/A
	- 60 s					N/A
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „D“ 2 samples B63 and C63 , 1P				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
	If the test is made in a test chamber, it shall be made in still air, the volume of the test chamber shall be such as not to affect the test results***				P
9.10	**Tests: DO**	**D0-51**	**D0-52**	**----**	**P**
	I_N	63 A			P
	Sect. (mm²)	16 mm^2			P
	Instantaneous tripping current	☒B	☒ C	☐D	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
	Test current $3I_N$ (A), starting from cold	189 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 45s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 90s (> 32A)***	39,5 s			P
	Test current 5 I_N (A), starting from cold	315 A			P
	Tripping less than:	[ms]			P
	0,1 s	17 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	160,7 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s				N/A
	- 120 s	29 s			P
9.10.2.3	☒ For circuit-breakers of the C – Type				P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	Test current $5I_N$ (A), starting from cold	315 A			P
	Opening time:	[s]			P
	- 0,1 s ** / 0,1s ≤ t ≤ 15s (≤ 32A)***				N/A
	- 0,1 s ** / 0,1s ≤ t ≤ 30s (> 32A)***	10,2 s			P
	Test current 10 I_N (A), starting from cold	630 A			P
	Tripping less than 0,1 s	[ms]			P
		71 ms			P
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	160,7 A			P
	opening time not less than 1 s or more than	[s]			P
	- 60 s				N/A
	- 120 s	27 s			P
9.10.2.4	☐ 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 ** / 0,1s ≤ t ≤ 4s (≤ 32A)***				N/A
	- 0,1s ≤ t ≤ 8s (> 32A)***				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	[s]	[s]	[s]	N/A
					N/A
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:***	_____ A			N/A
	opening time not less than 1 s or more than	[s]	[s]	[s]	N/A
	- 60 s				N/A
	- 120 s				N/A

	TESTS „E“ 3 samples D1 ,1P (Test in single-phase circuit)				P
9.12.11.4.2	**Test: E1 (Test at service short-circuit capacity)**	**E_1.1**	**E_1.2**	**E_1.3**	**P**
	Service short-circuit capacity ..... :	6000 A			P
	Test circuit: figure..... :	Figure 3			P
	Prospective current..... :	6000 A			P
	Prospective current obtained ..... :	6030 A			P
	Test voltage 1,05 Un** or 1,1 Un ***	253,5 V			P
	Power factor..... :	0,65 -0,70			P
	Power factor obtained..... :	0,67			P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	Sequence ..... :	O-O-CO			P
	T (min)..... :	3 min			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" = 45 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 ..... :	$1{,}49 \times 10^3$ A			P
	$I^2t \leq 5{,}23$ kA^{2}s	[kA^{2}s]	[kA^{2}s]	[kA^{2}s]	P
	Max. I^2t (kA^{2}s) L1	0,81	4,93	5,23	P
	L2	--	--	--	
	L3	--	--	--	
	N	--	--	--	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 240/415 V. The circuit – breaker is in the open position	(mA)	(mA	(mA)	P
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	--	--	--	N/A
	L3	--	--	--	N/A
	L4(N)	--	--	--	N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	Test current 0.85x non tripping current (1,13 I_N)	0,96 A			P
	- Passed for 1h	> 1h	> 1h	> 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			P
		[s]	[s]	[s]	P
	Tripping within ☒1 hour / ☐ 2 hour	157 s	172 s	132 s	P
	TESTS „E“ 3 samples D1 ,1P (Test in three-phase circuit)				
9.12.11.4.2	**Test: E1 (Test at service short-circuit capacity)**	**E_1.4**	**E_1.5**	**E_1-6**	
	Service short-circuit capacity.....:	6000 A			
	Test circuit: figure .....:	Figure 5			
	Prospective current.....:	6000 A			
	Prospective current obtained.....:	6150 A			
	Test voltage 1,05 Un** or 1,1 Un ***	435,6V			
	Power factor.....:	0,65-0,70			
	Power factor obtained.....:	0,70			
	Sequence.....:	See remark			
	T (min) .....:	3 min			
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” = 45 mm			
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			
	I_{Peak} (A) max. value .....:	887 A			
	$I^2t \leq$ 804 A^2s	[A^2s]	[A^2s]	[A^2s]	
	Max. I^2t (A^2s) L1 L2 L3 N	776,2 ___ ___ ___	___ 138,9 ___ ___	___ ___ 804 ___	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:				

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 240/415 V. The circuit – breaker is in the open position	(mA)	(mA	(mA)	
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 I_N)	0,96 A			
	- Passed for 1h	>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			
		[s]	[s]	[s]	
	Tripping within ☒ 1 hour / ☐ 2 hour	129 s	162 s	137 s	P
	TESTS „E“ 3 samples D63 ,1P(Test in single-phase circuit)				
9.12.11.4.2	**Test: E1 (Test at service short-circuit capacity)**	**E_1.7**	**E_1.8**	**E_1.9**	
	Service short-circuit capacity.....:	6000 A			
	Test circuit: figure .....:	Figure 3			
	Prospective current.....:	6000 A			
	Prospective current obtained.....:	6030 A			
	Test voltage 1,05 Un** or 1,1 Un ***	253,5V			
	Power factor.....:	0,65 - 0,70			
	Power factor obtained.....:	0,67			
	Sequence.....:	O-O-CO			
	T (min) .....:	3 min			

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
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" = 45 mm			
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			
	I_{Peak} (A) max. value .....:	4,19 $\times 10^3$ A			
	$I^2t \leq$ 63,2 kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	
	Max. I^2t (kA^2s) L1	62,2	63,2	44,2	P
	L2	--	--	--	
	L3	--	--	--	
	N	--	--	--	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 240/415 V. The circuit – breaker is in the open position	(mA)	(mA	(mA)	
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0, 1 mA	P
	L2	--	--	--	N/A
	L3	--	--	--	N/A
	L4(N)	--	--	--	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 I_N)	60,5 A			
	- Passed for 1h	> 1 h			P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5 A			
		[s]	[s]	[s]	
	Tripping within ☒ 1 hour / ☐ 2 hour	117 s	128 s	109 s	P
	TESTS „E“ 3 samples D63 ,1P(Test in three-phase circuit)				
9.12.11.4.2	**Test: E1 (Test at service short-circuit capacity)**	**E_1.10**	**E_1.11**	**E_1.12**	
	Service short-circuit capacity.....:	6000 A			
	Test circuit: figure .....:	Figure 5			
	Prospective current.....:	6000 A			
	Prospective current obtained.....:	6150 A			
	Test voltage 1,05 Un** or 1,1 Un ***	435,6 V			
	Power factor.....:	0,65 - 0,70			
	Power factor obtained.....:	0,70			
	Sequence.....:	See remark			
	T (min) .....:	3 min			
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” =45 mm			
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			
	I_{Peak} (A) max. value .....:	4,17 kA			
	$I^2t \leq 48{,}1\ kA^2s$	[kA^2s]	[kA^2s]	[kA^2s]	
	Max. I^2t (kA^2s) L1	36,2	___	___	P
	L2	___	29,9	___	
	L3	___	___	48,1	
	N	___	___	___	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.				P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	---				
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 240/41/5 V. The circuit – breaker is in the open position	(mA)	(mA	(mA)	
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	--	--	--	N/A
	L3	--	--	--	N/A
	L4(N)	--	--	--	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 I_N)	60,5 A			
	- Passed for 1h	>1h			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	_____ A			
		[s]	[s]	[s]	
	Tripping within ☒ 1 hour / ☐ 2 hour	127 s	89 s	102 s	P

	TESTS „E“ 3 samples D1 ,2P				
9.12.11.4.2	**Test: E1 (Test at service short-circuit capacity)**	**E_1-13**	**E_1-14**	**E_1-15**	
	Service short-circuit capacity.....:	6000 A			
	Test circuit: figure .....:	Figure 4b			
	Prospective current .....:	6000 A			
	Prospective current obtained.....:	6240 A			
	Test voltage 1,05 Un** or 1,1 Un ***	435,6 V			
	Power factor .....:	0,65-0,70			
	Power factor obtained .....:	0,66			
	Sequence .....:	O-O-CO			
	T (min) .....:	3 min			

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" = 45 mm			
	IEC / EN 60898					
Cl.	Requirement – Test		Result			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			
	I_{Peak} (A) max. value .....:		124 A			
	$I^2t \leq 45\ A^2s$		[A^2s]	[A^2s]	[A^2s]	
	Max. $I^2t \leq (A^2s$)	L1	44	45	42	P
		L2	31	36	27	
		L3	--	--	--	
		N	--	--	--	
	- No permanent arcing					P
	- No flash-over between poles or between poles and frame					P
	- No blowing of the fuses F and F′					P
	- Polyethylene foil shows no holes					P
	After the test:					
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 415 V. The circuit –breaker is in the open position		(mA)	(mA	(mA)	
	The leakage current shall not exceed 2 mA	L1	0,1 mA	0,1 mA	0,1 mA	P
		L2	0,1 mA	0,1 mA	0,1 mA	P
		L3	--	--	--	N/A
		L4(N)	--	--	--	N/A
	Electric strength test:					
	Test voltage 1500 V (see 8.7.2)					
	a)					P
	b)					P
	c)					P
Deleted **	d)					P
d) ***	e) 2000 V					N/A
	Test current 0.85x non tripping current (1,13 I_N)		0,96 A			
	- Passed for 1h		>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			
IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
		[s]	[s]	[s]	
	Tripping within ☒ 1 hour / ☐ 2 hour	127 s	139 s	112 s	P
	TESTS „E“ 3 samples D63 ,2P				
9.12.11.4.2	**Test: E1 (Test at service short-circuit capacity)**	**E_1.16**	**E_1.17**	**E_1.18**	
	Service short-circuit capacity.....:	6000 A			
	Test circuit: figure .....:	Figure 4b			
	Prospective current .....:	6000 A			
	Prospective current obtained.....:	6240 A			
	Test voltage 1,05 Un** or 1,1 Un ***	435,6 V			
	Power factor .....:	0,65-0,70			
	Power factor obtained .....:	0,66			
	Sequence .....:	O-O-CO			
	T (min) .....:	3 min			
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” = 45 mm			
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			
	I_{Peak} (A) max. value .....:	$3{,}94 \times 10^3$ A			
	$I^2t \leq 35{,}6\ kA^2s$	[kA^2s]	[kA^2s]	[kA^2s]	
	Max. I^2t (kA^2s) L1	35,6	33,7	32,2	P
	L2	34,4	33,0	31,8	
	L3	--	--	--	
	N	--	--	--	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				

9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.				P
IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 415 V. The circuit –breaker is in the open position	(mA)	(mA	(mA)	
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	0,1 mA	0,1 mA	0,1 mA	P
	L3	--	--	--	N/A
	L4(N)	--	--	--	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				P
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 I_N)	60,5 A			
	- Passed for 1h	>1h			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5 A			
		[s]	[s]	[s]	
	Tripping within ☒1 hour / ☐ 2 hour	97 s	133 s	123 s	P

	TESTS „E“ 3 samples D1 ,4P				
9.12.11.4.2	**Test: E1 (Test at service short-circuit capacity)**	**E_1.19**	**E_1.20**	**E_1.21**	
	Service short-circuit capacity .....:	6000 A			
	Test circuit: figure .....:	Figure 6			
	Prospective current .....:	6000 A			
	Prospective current obtained .....:	6150 A			
	Test voltage 1,05 Un** or 1,1 Un ***	435,6 V			

	Power factor .....:	0,65-0,70			
	Power factor obtained .....:	0,70			
	Sequence .....:	O-CO-CO			
	T (min) .....:	3 min			
	IEC / EN 60898				
Cl.	Requirement – Test	Result			Verdict
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" = 45 mm			
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			
	I_{Peak} (A) max. value .....:	590 A			
	$I^2t \leq 631\ A^2s$	[A^2s]	[A^2s]	[A^2s]	
	Max. I^2t (A^2s) L1	619	631	32,1	P
	L2	287	286	3,9	
	L3	153	163	10,2	
	N	--	--	--	
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 415 V. The circuit –breaker is in the open position	(mA)	(mA	(mA)	
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	0,1 mA	0,1 mA	0,1 mA	P
	L3	0,1 mA	0,1 mA	0,1 mA	P
	L4(N)	0,1 mA	0,1 mA	0,1 mA	P
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				P
	c)				P

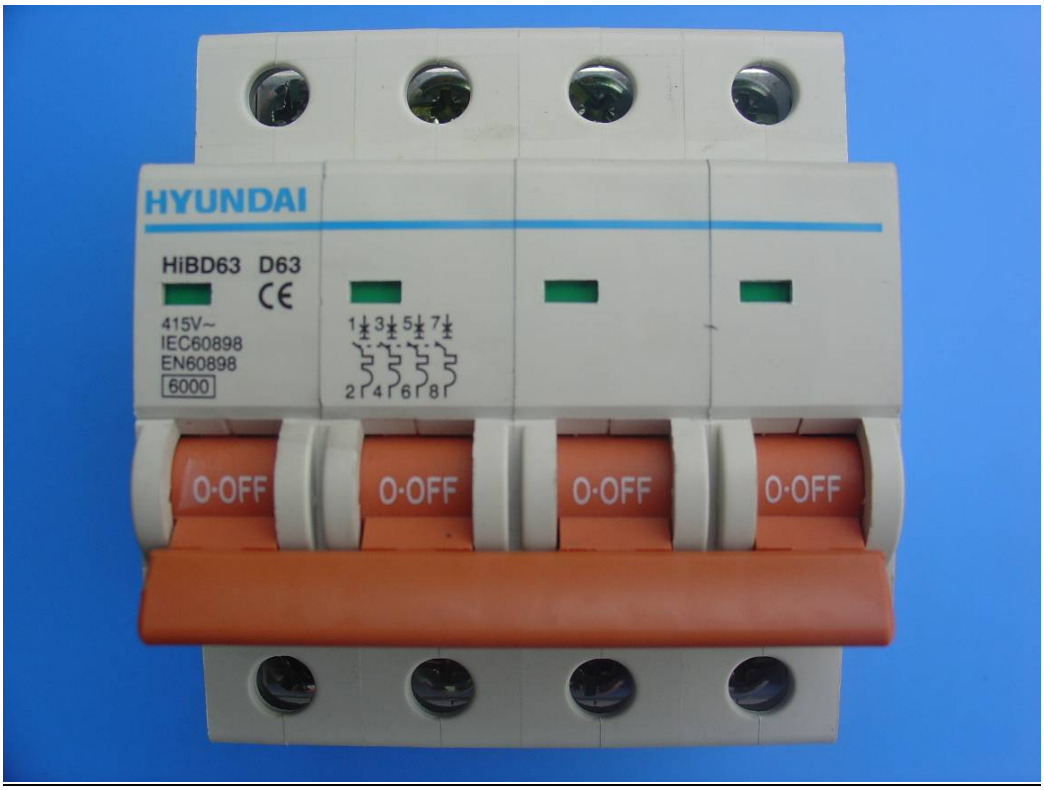
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 I_N)	0,96 A			
	- Passed for 1h	>1h			P
IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	1,60 A			
	- Passed for 2h	[s]	[s]	[s]	
	Tripping within ☒ 1 hour / ☐ 2 hour	87 s	52 s	46 s	P

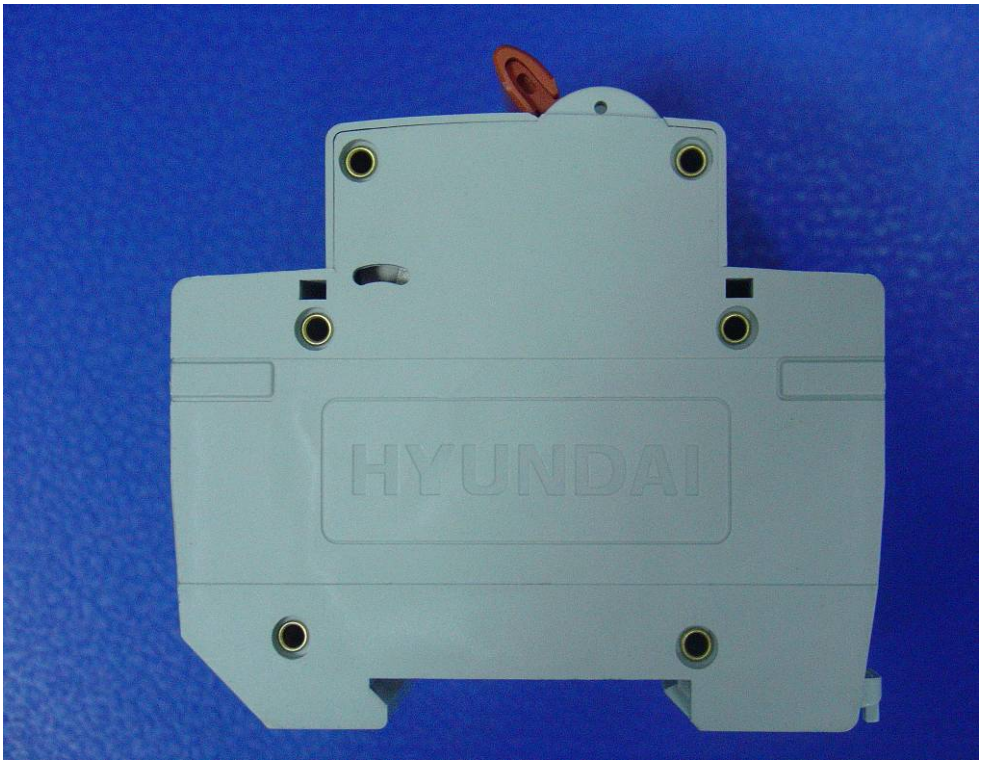
	TESTS „E“ 3 samples D63 ,4P				
9.12.11.4.2	**Test: E1 (Test at service short-circuit capacity)**	**E_1.22**	**E_1.23**	**E_1.24**	
	Service short-circuit capacity.....:	6000 A			
	Test circuit: figure .....:	Figure 6			
	Prospective current .....:	6000 A			
	Prospective current obtained.....:	6150 A			
	Test voltage 1,05 Un** or 1,1 Un ***	435,6 V			
	Power factor .....:	0,65-0,70			
	Power factor obtained .....:	0,70			
	Sequence .....:	O-CO-CO			
	T (min) .....:	3 min			
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” = 45 mm			
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			
	I_{Peak} (A) max. value .....:	$4{,}14 \times 10^3$ A			
	$I^2t \leq \underline{49{,}4}$ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	
	Max. I^2t(kA^2s) L1	24,3	13,0	22,6	P
	L2	21,8	35,8	32,4	
	L3	49,4	40,0	39,4	
	N	--	--	--	
	- No permanent arcing				P

	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				
IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without 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.= 415 V. The circuit –breaker is in the open position	(mA)	(mA	(mA)	
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2	0,1 mA	0,1 mA	0,1 mA	P
	L3	0,1 mA	0,1 mA	0,1 mA	P
	L4(N)	0,1 mA	0,1 mA	0,1 mA	P
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				P
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 I_N)	60,5 A			
	- Passed for 1h	>1h			P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100,5 A			
		[s]	[s]	[s]	
	Tripping within ☒ 1 hour / ☐ 2 hour	53 s	37 s	108 s	P

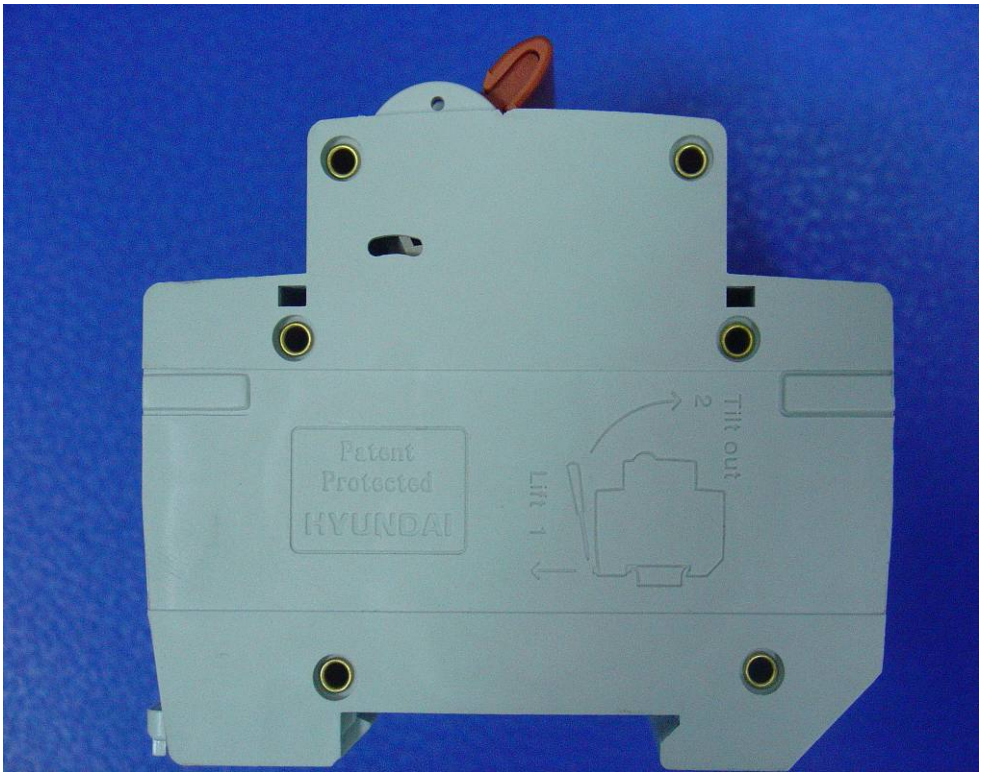
IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „E2“ 3 or 4 samples	**NOT APPLICABLE**			
9.12.11.4.3	**Test: E2 (Test at rated short-circuit capacity)**	**E_{2-1}**	**E_{2-2}**	**E_{2-3}**	
	TESTS „E3“ 3 or 4 samples	**NOT APPLICABLE**			
9.12.11.4.4	**Test: E3 (Test at making and breaking capacity on a individual pole (Icn1)**	**E_{3-1}**	**E_{3-2}**	**E_{3-3}**	N/A
	Annex E (normative)				N/A
Deleted **	**Special requirements for auxiliary circuits for safety extra-low voltage NOT APPLICABLE**				N/A
	Annex J (normative)				N/A
	Particular requirements for circuit-breakers with screwless type terminals for external copper conductors (In not exceeding 20 A, cross-sectional area up to 4 mm$^{2)}$				N/A
	Annex K (normative)				N/A
	Particular requirements for circuit-breakers with flat quick-connect terminations **NOT APPLICABLE**				N/A
	Annex L (normative)				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 aluminium conductors				N/A
	Annex ZC (normative)				N/A
	Special national conditions (only for EN 60898-1)				N/A

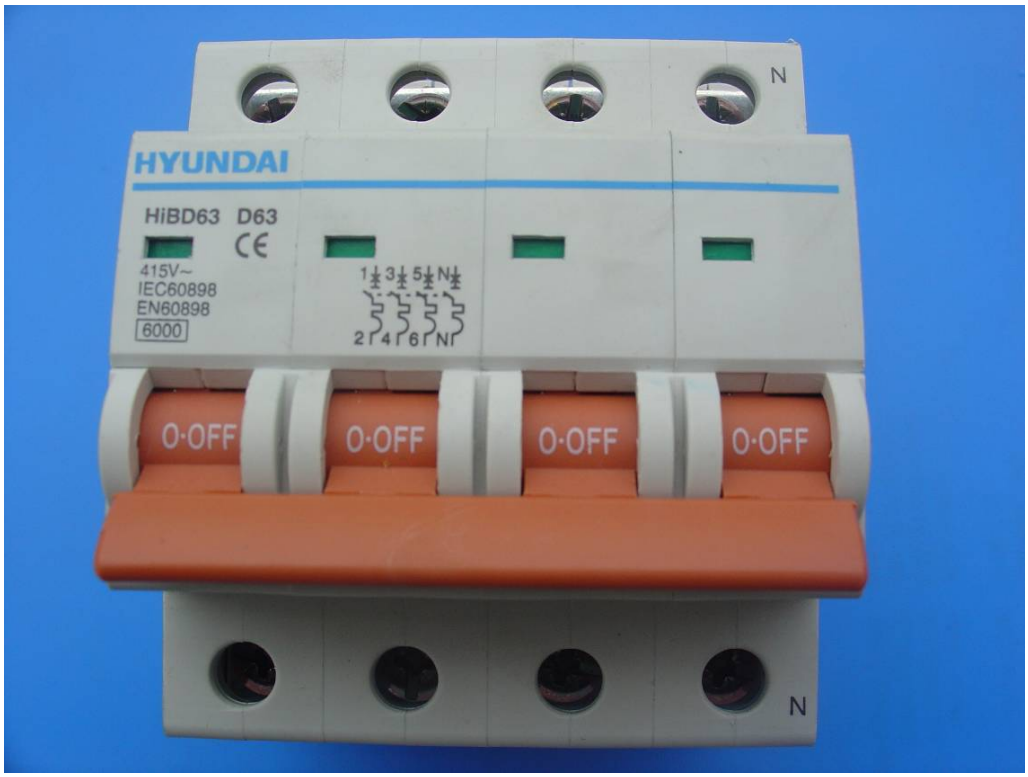
Photos of samples :





Photos of samples :


Patent
Protected
HYUNDAI
Lift 1
2
Tilt out


HYUNDAI
HiBD63 D63
CE
415V~
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1 3 5 N
2 4 6 N
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Photos of samples :

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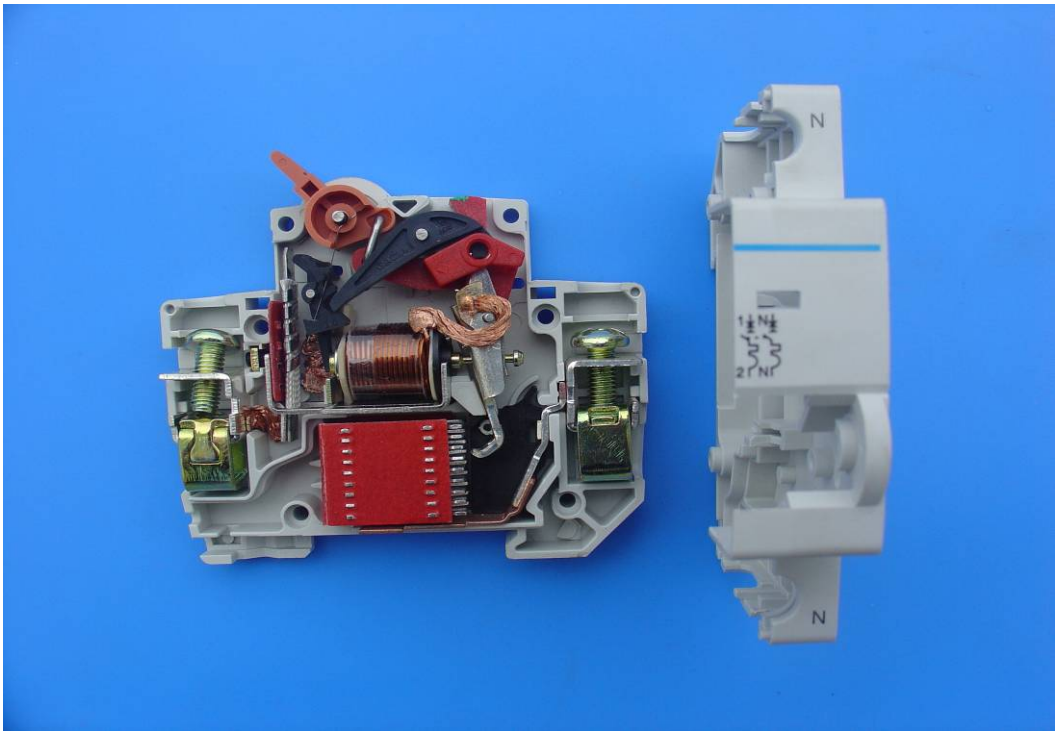

Photos of samples :