



Test Report issued under the responsibility of



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. : W0711001.50
Tested by (name+signature)..... : Harry wang *Harry wang*
Witnessed by (name+signature)..... :
Supervised by (name+signature)..... :
Approved by (name+signature) : Warron Wang *Warron Wang*
Date of issue : 2008-04-15

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Wenzhou,Zhejiang,325603 P.R.China
Testing location/ procedure : CBTL RMT SMT WMT TMP
Testing location/ address : 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

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Test item description	Circuit-breakers for overcurrent protection (MCB)
Trade Mark	HYUNDAI
Model/Type reference	HiBD63h
Ratings	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,D type Ics: 7500 A ; Icn: 10 000 A

Copy of marking plate:



Summary of testing:									
The following samples were chosen for the type test according to annex C of IEC/EN 60898-1									
Test sequence	D type tested first			C type			B type		
	1P	2P	4P	1P	2P	4P	1P	4P	
A	1 / 63 A	N/A	1 / 63 A	N/A	N/A	N/A	N/A	N/A	
B	3 / 63 A	N/A	3 / 63 A	N/A	N/A	N/A	3 / 63 A (only 9.8)	3 / 63 A (only 9.8)	
C	C1	3 / 63 A	N/A	3 / 63 A	N/A	N/A	N/A	N/A	
	C2	3 / 63 A	2 / 63 A	1 / 63 A	N/A	N/A	N/A	N/A	
D	D0+D1	3 / 63 A	N/A	3 / 63 A	N/A	N/A	N/A	N/A	
	D0	Each 1 for all other rated current	N/A	N/A	Each 1 for all other rated current (only 9.10.2)	N/A	N/A	Each 1 for all rated current (only 9.10.2)	
E1	3+3 / 63 A 3+3 / 1 A	3 / 63 A 3 / 1 A	3+3 / 63 A 3+3 / 1 A	N/A	N/A	N/A	N/A	N/A	
E2	3+4 / 63 A 3+4 / 1 A	3 / 63 A 3 / 1 A	3+3 / 63 A 3+3 / 1 A	N/A	N/A	N/A	N/A	N/A	
E3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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 I²t 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	--

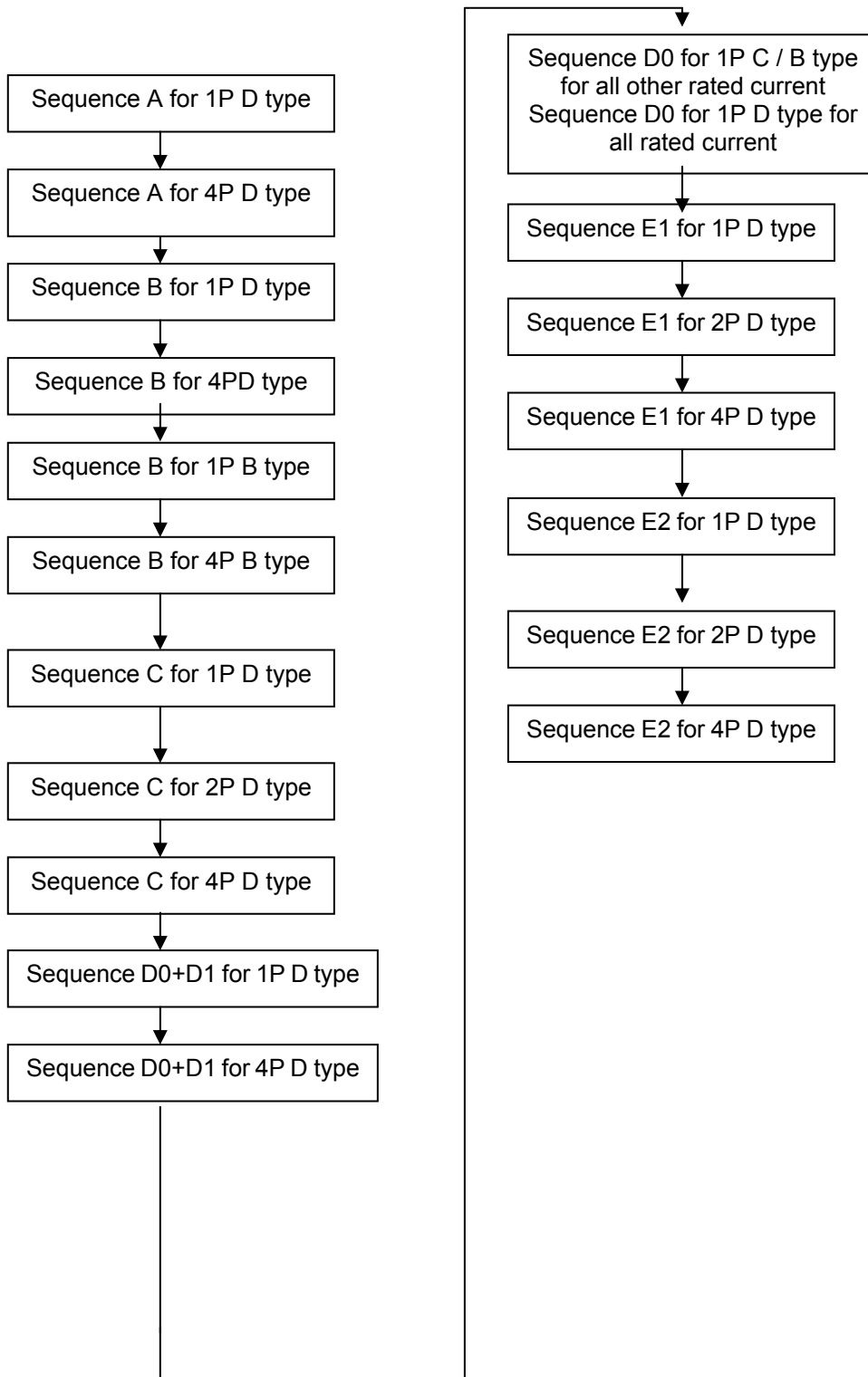
2. Test at rated short-circuit capacity (Icn):

For single-pole circuit-breakers of rated voltage 230 / 400V or 240 / 415V ,an additional set of four samples is tested in a circuit according to figure 5. During the test the I²t values need not be measured.

The test procedure is shown as below:

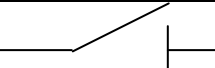
Operation	Samples			
	1	2	3	4
1	O	O	O	--
2	O	CO	--	--
3	--	--	CO	O

Structure of the test report



Test items particulars:	
Type of circuit-breaker	HiBD63h
Number of poles	<input checked="" type="checkbox"/> 1-P <input checked="" type="checkbox"/> 1-P+N <input checked="" type="checkbox"/> 2-P <input checked="" type="checkbox"/> 3-P <input checked="" type="checkbox"/> 3-P+N <input checked="" type="checkbox"/> 4-P <input type="checkbox"/> Other
Protection against external influences	<input type="checkbox"/> enclosed <input checked="" type="checkbox"/> unenclosed
Method of mounting	<input type="checkbox"/> surface <input checked="" type="checkbox"/> flush <input checked="" type="checkbox"/> panel board / distribution board
Method of connection	<input checked="" type="checkbox"/> .not associated with the mechanical mounting <input type="checkbox"/> associated with the mechanical mounting
Instantaneous tripping current	<input checked="" type="checkbox"/> B <input checked="" type="checkbox"/> C <input checked="" type="checkbox"/> D
Ambient air temperature (°C)	<input checked="" type="checkbox"/> 30°C <input type="checkbox"/> 40°C <input type="checkbox"/> Other _____°C
Energy limiting class	<input type="checkbox"/> Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3
Rated short-circuit capacity (A)	<input type="checkbox"/> 1,5 kA <input type="checkbox"/> 3 kA <input type="checkbox"/> 4,5 kA <input type="checkbox"/> 6 kA <input checked="" type="checkbox"/> 10 kA <input type="checkbox"/> 15 kA <input type="checkbox"/> 20 kA <input type="checkbox"/> 25 kA
Type of terminal	<input type="checkbox"/> screw ^{a) b)} <input checked="" type="checkbox"/> pillar ^{a) b)} <input type="checkbox"/> cage ^{a) b)} <input type="checkbox"/> lug <input type="checkbox"/> screw less ⁾ <input type="checkbox"/> flat quick connect ^{a)} <input type="checkbox"/> plug-in <input type="checkbox"/> screw-in ^{a)} copper conductors ^{b)} aluminium conductors***
Value of rated operational voltage	<input type="checkbox"/> 120 V ** <input type="checkbox"/> 230 V <input type="checkbox"/> 240 V ** <input type="checkbox"/> 120/240 V ** <input type="checkbox"/> 230/400 V <input type="checkbox"/> 400 V <input checked="" type="checkbox"/> 240/415 V <input checked="" type="checkbox"/> 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	<input checked="" type="checkbox"/> 50 Hz <input checked="" type="checkbox"/> 60 Hz
Rated impulse withstand voltage (U _{imp})	<input type="checkbox"/> 2,5 kV** <input checked="" type="checkbox"/> 4 kV <input type="checkbox"/> declared ___kV
Material group and CTI declared by manufacturer	<input type="checkbox"/> Group I, (600 V ≤ CTI) <input type="checkbox"/> Group II, (400 V ≤ CTI < 600 V) <input checked="" type="checkbox"/> 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	2007-12
Date(s) of performance of test	2007-12 ~ 2008-03
General product information:	
<p>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: 7500 A ; Icn: 10 000 A</p> <p>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 except the label 'N' are indicated on the marking plate of 1P+N and 3P+N.</p> <p>Factory Location : Lianzhong Avenue,Xinba Scientific Technologic Zone,Yangzhong,Jiangsu,P.R. China</p>	

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS “A” 1 sample	Type: D63 1P	P
6	MARKING AND OTHER INFORMATION		
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.....	HiBD63h	P
	c) Rated voltage (V).....	240 / 415 V	P
	d) Rated current (A)	63 A	P
	e) Rated frequency (Hz).....	50 / 60 Hz	P
	f) Rated short circuit capacity (A):within a rectangle, without symbol “A”	10 000 in 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 (I _{cn1}), if different from I _{cn}	Identical to I _{cn}	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		P
	Energy limiting class		N/A
	I ² t 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 -	O - OFF I - ON	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		P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	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:		
	- the circuit-breaker shall comply with all the requirements of the additional standard;		
	- 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		
	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 may be provided		P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	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		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	≥ 4,6 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	≥ 4,7 mm	P
	- screws or other means for fixing covers.....		N/A
	- surface on which the base is mounted.....	≥ 4,6 mm	P
	- screws or other means for fixing the circuit breaker		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts.....	≥ 6.8 mm	P
	- metal frames supporting the base (flush-type)...	≥ 4,6 mm	P
Deleted **	5.between metal parts of mechanism and:		P
	- accessible metal parts.....	≥ 7,1 mm	P
	- screws or other means for fixing the circuit breaker		N/A
	- metal frames supporting the base (flush type)...	≥ 4.6 mm	P
8.1.3	Creepage distances [mm] (see table 4)		P
	Insulating material		P
	Comparative tracking index (CTI)	175 V	P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	Material group	<input type="checkbox"/> I <input type="checkbox"/> II <input checked="" type="checkbox"/> IIIa	P
	1.between live parts (of the min circuits) which are separated when the CB is in off position	≥ 4,6 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	≥ 4.7mm	P
	- screws or other means for fixing covers.....		N/A
	- surface on which the base is mounted	≥ 4.6 mm	P
	- screws or other means for fixing the circuit breaker		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts.....	≥ 6,8 mm	P
	- metal frames supporting the base (flush-type)...	≥ 4,6 mm to mounting rail	P
Deleted **	5.between metal parts of mechanism and:		P
	- accessible metal parts	≥ 7,1 mm	P
	- screws or other means for fixing the circuit breaker		N/A
	- metal frames supporting the base (flush type)...	≥ 4,6 mm to mounting 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)		N/A
	- 5 times (screw Ø / torque Nm)	Ø 5,0 mm 2,0 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		N/A
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


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Cl.	Requirement – Test	Result	Verdict
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)	cl. 9.5	P
9.5	Torque Ø 5,0 mm 2,0 Nm max. sect. 25 mm ²		P
9.5.1	Pull test: min sect. 1,0 mm ² max sect. 25 mm ² Pull 100 N for 1 min During the test conductor does not move noticeably		P
9.5.2	min sect. 1,0 mm ² Torque (2/3)= 1,33 Nm max sect. 25 mm ² The conductor shows no damage		P
9.5.3	Nominal cross-section from No of wires 19 Ø of wires 1,53 mm Torque (2/3) = 1,33 Nm No of wires 7 Ø of wires 0,67 mm Torque (2/3) = 1,33 Nm 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	Range of nominal cross (A) sections to be clamped (mm ²)	1 - 25 mm ²	P
	≤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		
	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			N/A
	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 ≤ 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"			N/A
	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 **			N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
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		N/A
	For circuit-breakers intended to be mounted on bases forming a unit therewith(plug-in or screw-in type) it shall not be possible, without the aid of a tool, to replace a circuit-breaker when mounted as for normal use by another of the same make having a higher rated current, compliance is checked by inspection		N/A
8.1.7	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
	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

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	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 additionally 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	Housing body: 0,8 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		N/A
8.11	Resistance to abnormal heat and to fire		P
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions		P
9.15	Resistance to abnormal heat and to fire		P
	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	Housing body	P

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Cl.	Requirement – Test	Result	Verdict
	all other external parts (650 ± 10)°C	Switch knob	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
	16 min at 100°C		P
	No sign of rust		P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „A“ 1 sample	type: D63 4P	P
6	MARKING AND OTHER INFORMATION		
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.....	HiBD63h	P
	c) Rated voltage (V).....	240 / 415 V	P
	d) Rated current (A)	63 A	P
	e) Rated frequency (Hz).....	50 / 60 Hz	P
	f) Rated short circuit capacity (A):within a rectangle, without symbol "A"	10 000 in 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 (I _{cn1}), if different from I _{cn}	Identical to I _{cn}	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		P
	Energy limiting class		N/A
	I ² t 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 - O - OFF I - ON	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		P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	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 ***		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		P
	The switched neutral shall close before and open after the protected pole (s)		N/A
	Neutral pole having adequate making and breaking capacity and CB with independent manual operation: all poles operate together including neutral pole		N/A
	CB shall have a trip free mechanism		P
	It shall be possible to switch the CB on and off by hand		P
	No intermediate position of the contacts		P
	Position of contacts shall be indicated		P
	Indication visible from the outside		P
	If the indication is on the actuating means, it shall, when released, automatically take up or stay in the position corresponding to that of the moving contacts; operating means shall have two different rest positions, except that, for automatic operation, a third distinct rest position may be provided		P

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Cl.	Requirement – Test	Result	Verdict
	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		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	≥ 4,6 mm	P
	2.between live parts of different polarity	≥ 6,7 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	≥ 4,7 mm	P
	- screws or other means for fixing covers.....		N/A
	- surface on which the base is mounted.....	≥ 4,6 mm	P
	- screws or other means for fixing the circuit breaker		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts.....	≥ 6,8 mm	P
	- metal frames supporting the base (flush-type)..:	≥ 4,6 mm	P
Deleted **	5.between metal parts of mechanism and:		P
	- accessible metal parts.....	≥ 7,1 mm	P
	- screws or other means for fixing the circuit breaker		N/A
	- metal frames supporting the base (flush type)..:	≥ 4,6 mm	P
8.1.3	Creepage distances [mm] (see table 4)		P
	Insulating material		P
	Comparative tracking index (CTI)	175 V	P

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Cl.	Requirement – Test	Result	Verdict
	Material group	<input type="checkbox"/> I <input type="checkbox"/> II <input checked="" type="checkbox"/> IIIa	P
	1.between live parts (of the min circuits) which are separated when the CB is in off position	≥ 4,6 mm	P
	2.between live parts of different polarity	≥ 6,7 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	≥ 4,7 mm	P
	- screws or other means for fixing covers.....		N/A
	- surface on which the base is mounted	≥ 4,6 mm	P
	- screws or other means for fixing the circuit breaker		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts.....	≥ 6,8 mm	P
	- metal frames supporting the base (flush-type)...	≥ 4,6 mm to mounting rail	P
Deleted **	5.between metal parts of mechanism and:		P
	- accessible metal parts	≥ 7,1 mm	P
	- screws or other means for fixing the circuit breaker		N/A
	- metal frames supporting the base (flush type)...	≥ 4,6 mm to mounting 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)		N/A
	- 5 times (screw Ø / torque Nm)	Ø 5,0 mm 2,0 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		N/A
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

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Cl.	Requirement – Test	Result	Verdict
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		P
	- alloy 50% copper for other parts		P
	- other metal		P
	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)	cl. 9.5	P
9.5	Torque Ø 5,0 mm 2,0 Nm max. sect. 25 mm ²		P
9.5.1	Pull test: min sect. 1,0 mm ² max sect. 25 mm ² Pull 100 N for 1 min During the test conductor does not move noticeably		P
9.5.2	min sect. 1,0 mm ² Torque (2/3)= 1,33 Nm max sect. 25 mm ² The conductor shows no damage		P
9.5.3	Nominal cross-section from No of wires 19 Ø of wires 1,53 mm Torque (2/3) = 1,33 Nm No of wires 7 Ø of wires 0,67 mm Torque (2/3) = 1,33 Nm 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	Range of nominal cross (A) sections to be clamped (mm ²)	1 - 25 mm ²	P
	≤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		
	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 ≤ 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"			N/A
	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 **			N/A

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Cl.	Requirement – Test	Result	Verdict
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		N/A
	For circuit-breakers intended to be mounted on bases forming a unit therewith(plug-in or screw-in type) it shall not be possible, without the aid of a tool, to replace a circuit-breaker when mounted as for normal use by another of the same make having a higher rated current, compliance is checked by inspection		N/A
8.1.7	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
	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

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Cl.	Requirement – Test	Result	Verdict
	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 additionally 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	Housing body: 0,8 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		N/A
8.11	Resistance to abnormal heat and to fire		P
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions		P
9.15	Resistance to abnormal heat and to fire		P
	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	Housing body	P

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Cl.	Requirement – Test	Result	Verdict
	all other external parts (650 ± 10)°C	Switch knob	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
	16 min at 100°C		P
	No sign of rust		P

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Cl.	Requirement – Test	Result			Verdict
	TESTS „B“ 3 samples	type: D63 1P			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	
	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 (U _{imp})			P	
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2.	U _{imp} = 4 kV			P
9.7	Test of dielectric properties and isolating capability			P	
9.7.1	Resistance to humidity			P	
9.7.1.1	Preparation of the circuit-breaker for test			P	
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				N/A
9.7.1.2	Test conditions			P	
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	R _f = 95 % T = 25 °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:				
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position $\geq 2 \text{ M}\Omega$	B-1	B-2	B-3	P
		$\geq 500 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	
	b) in off-position, between each pole in turn and the				N/A

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Cl.	Requirement – Test	Result			Verdict
	others connected together $\geq 2 \text{ M}\Omega$				
	c) in on-position, between all poles connected together and the frame $\geq 5 \text{ M}\Omega$	B-1	B-2	B-3	P
		$\geq 500 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	
Deleted **	d) between metal parts of mechanism and the frame $\geq 5 \text{ M}\Omega$	B-1	B-2	B-3	N/A
d) ***	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material $\geq 5 \text{ M}\Omega$				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	2000 V			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 $U = \text{___} \text{ V}$				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 $U = [1000 \text{ V if } U_i \leq 60 \text{ V or } 2U_i + 1000 \text{ V if } U_i \geq 60 \text{ V}]$				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 1,2/50 μs 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 U_{imp} 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

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Cl.	Requirement – Test	Result	Verdict
	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
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)		P
	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		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	63 A	N/A
	Ambient air temperature	23,8 °C	P
	Temperature rise [K]		P
	Terminals for external connections 60 K	B-1 B-2 B-3	P
	Terminal L1 top side	46 K 44 K 46 K	
	Terminal L1 bottom side	44 K 45 K 42 K	
	Terminal L2 top side		
	Terminal L2 bottom side		
	Terminal L3 top side		
	Terminal L3 bottom side		
	Terminal L4 top side		
	Terminal L4 bottom side		
	External parts liable to be touched during manual operation of the circuit-breaker, including operating	B-1 B-2 B-3	P

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Cl.	Requirement – Test	Result			Verdict
	means of insulating material and metallic means for coupling of insulating operating means of several poles 40 K	19 K	17 K	17 K	
	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	B-1	B-2	B-3	P
		40 K	41 K	39 K	
9.8.5	Measurement of power losses				
	Power losses do not exceed the values stated in table 15	13 W			P
	Test current: $I_N = 63$ A (reach the steady state value) $U_n \geq 30$ V				P
	Loaded one pole after the other				P
	Max. power loss: L1 L2 L3 L4	B-1	B-2	B-3	P
		6,8 W	7,2 W	6,5 W	
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 mm ²	63 A			P
	During the test no tripping during the last period, temperature rise shall be measured				P
	Ambient air temperature	22,4 °C			P
	Parts Temperature rise [K]				P
	Terminals for external connections75 Terminal L1 top side Terminal L1 bottom side Terminal L2 top side Terminal L2 bottom side Terminal L3 top side Terminal L3 bottom side Terminal L4 top side Terminal L4 bottom side	B-1	B-2	B-3	P
		60 K	56 K	58 K	
		57 K	56 K	55 K	

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Cl.	Requirement – Test	Result			Verdict
	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	B-1	B-2	B-3	P
	- 1h (≤ 63 A)	152 s	63 s	112 s	
	- 2h (≥ 63 A)				

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Cl.	Requirement – Test	Result			Verdict
	TESTS „B“ 3 samples	type: D63 4P			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
	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 (U _{imp})				P
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2.	U _{imp} = 4 kV			P
9.7	Test of dielectric properties and isolating capability				P
9.7.1	Resistance to humidity				P
9.7.1.1	Preparation of the circuit-breaker for test				P
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				N/A
9.7.1.2	Test conditions				P
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	R _f = 95 % T = 25 °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:				
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position $\geq 2 \text{ M}\Omega$	B-4 $\geq 500 \text{ M}\Omega$	B-5 $\geq 500 \text{ M}\Omega$	B-6 $\geq 500 \text{ M}\Omega$	P
	b) in off-position, between each pole in turn and the	B-4	B-5	B-6	P

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Cl.	Requirement – Test	Result			Verdict
	others connected together $\geq 2 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	
	c) in on-position, between all poles connected together and the frame $\geq 5 \text{ M}\Omega$	B-4	B-5	B-6	P
		$\geq 500 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	$\geq 500 \text{ M}\Omega$	
Deleted **	d) between metal parts of mechanism and the frame $\geq 5 \text{ M}\Omega$	B-4	B-5	B-6	N/A
d) ***	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material $\geq 5 \text{ M}\Omega$				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	2000 V			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 $U = \text{___} \text{ V}$				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 $U = [1000 \text{ V if } U_i \leq 60 \text{ V or } 2U_i + 1000 \text{ V if } U_i \geq 60 \text{ V}]$				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 1,2/50 μ s 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 U_{imp} 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

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Cl.	Requirement – Test	Result	Verdict																								
	The 1,2/50 μ s 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																								
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)		P																								
	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		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, \leq 1K/h) Four-pole CB's: 1) three poles loaded 2) one pole and neutral pole loaded	63 A	P																								
	Ambient air temperature	23,8 °C	P																								
	Temperature rise [K]		P																								
	Terminals for external connections 60 K	<table border="1"> <thead> <tr> <th></th> <th>B-4</th> <th>B-5</th> <th>B-6</th> </tr> </thead> <tbody> <tr> <td>L1</td> <td>56 K</td> <td>59 K</td> <td>55 K</td> </tr> <tr> <td>L2</td> <td>59 K</td> <td>58 K</td> <td>57 K</td> </tr> <tr> <td>L3</td> <td>59 K</td> <td>58 K</td> <td>59 K</td> </tr> <tr> <td>L4 (N)</td> <td>53 K</td> <td>57 K</td> <td>51 K</td> </tr> <tr> <td>L3</td> <td>58 K</td> <td>58 K</td> <td>58 K</td> </tr> </tbody> </table>		B-4	B-5	B-6	L1	56 K	59 K	55 K	L2	59 K	58 K	57 K	L3	59 K	58 K	59 K	L4 (N)	53 K	57 K	51 K	L3	58 K	58 K	58 K	P
	B-4	B-5	B-6																								
L1	56 K	59 K	55 K																								
L2	59 K	58 K	57 K																								
L3	59 K	58 K	59 K																								
L4 (N)	53 K	57 K	51 K																								
L3	58 K	58 K	58 K																								
	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	<table border="1"> <thead> <tr> <th></th> <th>B-4</th> <th>B-5</th> <th>B-6</th> </tr> </thead> <tbody> <tr> <td></td> <td>21 K</td> <td>19 K</td> <td>20 K</td> </tr> </tbody> </table>		B-4	B-5	B-6		21 K	19 K	20 K	P																
	B-4	B-5	B-6																								
	21 K	19 K	20 K																								
	External metallic parts of operating means .. 25 K		N/A																								

IEC / EN 60898					
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	B-4 47 K	B-5 44 K	B-6 47 K	P
9.8.5	Measurement of power losses				
	Power losses do not exceed the values stated in table 15	13 W			P
	Test current: $I_N = 63$ A (reach the steady state value) $U_n \geq 30$ V				P
	Loaded one pole after the other				P
	Max. power loss:	B-4	B-5	B-6	P
	L1	6,3 W	6,4 W	6,1 W	
	L2	6,7 W	6,7 W	5,9 W	
	L3	6,5 W	7,2 W	6,2 W	
	L4	7,2 W	6,5 W	6,8 W	
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 mm ²	63 A			P
	During the test no tripping during the last period, temperature rise shall be measured				P
	Ambient air temperature	24,2 °C			P
	Parts Temperature rise [K]				P
	Terminals for external connections 75 K	B-4	B-5	B-6	P
	L1	71 K	72 K	66 K	
	L2	73 K	73 K	70 K	
	L3	72 K	7 K	72 K	
	L4 (N)	69 K	70 K	65 K	
	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 $I_N = 91,35$ A	91,4 A			P
	- Tripping within	B-4	B-5	B-6	P
	- 1h (≤ 63 A)	38 s	87 s	56 s	
	- 2h (≥ 63 A)				

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „B“ 3 samples	type: B63 1P			P
8.3	Dielectric properties and isolating capability				N/A
	CB shall have adequate dielectric properties and shall ensure isolation:				N/A
8.3.1	Dielectric strength at power frequency				N/A
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition				N/A
8.3.2	Isolating capability				N/A
	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.				N/A
8.3.3	Dielectric strength at rated impulse withstand voltage (Uimp)				N/A
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2.				N/A
9.7	Test of dielectric properties and isolating capability				N/A
9.7.1	Resistance to humidity				N/A
9.7.1.1	Preparation of the circuit-breaker for test				N/A
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				N/A
9.7.1.2	Test conditions				N/A
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C				N/A
9.7.1.3	Test procedure:				N/A
	The sample is kept in the cabinet for 48 h.				N/A
9.7.1.4	Condition of the circuit-breaker after the test				N/A
	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				N/A
9.7.2	Insulation resistance of the main circuit				N/A
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:				N/A
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position $\geq 2 \text{ M}\Omega$	B-7	B-8	B-9	N/A
	b) in off-position, between each pole in turn and the others connected together $\geq 2 \text{ M}\Omega$				N/A

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Cl.	Requirement – Test	Result			Verdict
	c) in on-position, between all poles connected together and the frame $\geq 5 \text{ M}\Omega$	B-7	B-8	B-9	N/A
Deleted **	d) between metal parts of mechanism and the frame $\geq 5 \text{ M}\Omega$	B-7	B-8	B-9	N/A
d) ***	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material $\geq 5 \text{ M}\Omega$				N/A
9.7.3	Dielectric strength of the main circuit				N/A
	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				N/A
	a) 2000 V				N/A
	b) 2000 V				N/A
	c) 2000 V				N/A
Deleted **	d) 2000 V				N/A
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 $U = \text{___ V}$				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 $U = [1000 \text{ V if } U_i \leq 60 \text{ V or } 2U_i + 1000 \text{ V if } U_i \geq 60 \text{ V}]$				N/A
9.7.6	Verification of the impulse withstand voltage (across clearances and across solid insulation) and leakage current across open contacts				N/A
9.7.6.1	Verification of the impulse withstand voltage across open contacts (suitability for isolation)				N/A
	The 1,2/50 μs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum				N/A
	- rated impulse withstand voltage (kV) :				N/A
	- sea level of the laboratory:				N/A
	- test U_{imp} on open min contacts (equipment suitable for isolating) (see table 13)..... :				N/A
	- no unintentional disruptive discharge during the tests				N/A
9.7.6.2	Verification of impulse withstand voltage for the parts not test in 9.7.6.1				N/A
	The 1,2/50 μs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum				N/A
	- rated impulse withstand voltage (kV) :				N/A
	- sea level of the laboratory:				N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	- test Uimp min circuits (see table 14) :				N/A
	Application of test voltage				N/A
	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)				N/A
	- no unintentional disruptive discharge during the tests				N/A
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)				N/A
	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				N/A
	The leakage current flowing across the open contacts is measured and shall not exceed 2 mA				N/A
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, $\leq 1K/h$) Four-pole CB's: 1) three poles loaded 2) one pole and neutral pole loaded	63 A			N/A
	Ambient air temperature	22,0 °C			P
	Temperature rise [K]				P
	Terminals for external connections 60 K	B-7	B-8	B-9	P
	Terminal L1 top side	47 K	46 K	44 K	
	Terminal L1 bottom side	47 K	48 K	45 K	
	Terminal L2 top side				
	Terminal L2 bottom side				
	Terminal L3 top side				
	Terminal L3 bottom side				
	Terminal L4 top side				
	Terminal L4 bottom side				
	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	B-7	B-8	B-9	P
		28 K	28 K	26 K	
	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	B-7	B-8	B-9	P
		43 K	44 K	42 K	
9.8.5	Measurement of power losses				P
	Power losses do not exceed the values stated in table 15	13 W			P
	Test current: $I_N = 63$ A (reach the steady state value) $U_n \geq 30$ V				P
	Loaded one pole after the other				P
	Max. power loss:	B-7	B-8	B-9	P
	L1	4,7 W	4,6 W	4,9 W	
	L2				
	L3				
	L4				
8.5	Uninterrupted duty				N/A
	Circuit-breakers operate reliable even after long service				N/A
9.9	28 day test				N/A
	28 cycles- 21 h with current - 3 h without current cross sectional area. 16 mm ²				N/A
	During the test no tripping during the last period, temperature rise shall be measured				N/A
	Ambient air temperature				N/A
	Parts Temperature rise [K]				N/A
	Terminals for external connections60	B-7	B-8	B-9	N/A
	Terminal L1 top side				
	Terminal L1 bottom side				
	Terminal L2 top side				
	Terminal L2 bottom side				
	Terminal L3 top side				
	Terminal L3 bottom side				
	Terminal L4 top side				
	Terminal L4 bottom side				
	The temperature rise does not exceed the value measured during the temperature rise test (subclause 8.8) by more than 15 K				N/A
	Test current 1,45 $I_N =$ ____ A				N/A
	- Tripping within	B-7	B-8	B-9	N/A

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Cl.	Requirement – Test	Result			Verdict
	- 1h (\leq 63 A)				
	- 2h (\geq 63 A)				

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „B“ 3 samples	type: B63 4P			P
8.3	Dielectric properties and isolating capability				N/A
	CB shall have adequate dielectric properties and shall ensure isolation:				N/A
8.3.1	Dielectric strength at power frequency				N/A
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition				N/A
8.3.2	Isolating capability				N/A
	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.				N/A
8.3.3	Dielectric strength at rated impulse withstand voltage (Uimp)				N/A
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2.				N/A
9.7	Test of dielectric properties and isolating capability				N/A
9.7.1	Resistance to humidity				N/A
9.7.1.1	Preparation of the circuit-breaker for test				N/A
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				N/A
9.7.1.2	Test conditions				N/A
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C				N/A
9.7.1.3	Test procedure:				N/A
	The sample is kept in the cabinet for 48 h.				N/A
9.7.1.4	Condition of the circuit-breaker after the test				N/A
	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				N/A
9.7.2	Insulation resistance of the main circuit				N/A
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:				N/A
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position $\geq 2 \text{ M}\Omega$	B-10	B-11	B-12	N/A
	b) in off-position, between each pole in turn and the others connected together $\geq 2 \text{ M}\Omega$	B-10	B-11	B-12	N/A

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Cl.	Requirement – Test	Result			Verdict
	c) in on-position, between all poles connected together and the frame $\geq 5 \text{ M}\Omega$	B-10	B-11	B-12	N/A
Deleted **	d) between metal parts of mechanism and the frame $\geq 5 \text{ M}\Omega$	B-10	B-11	B-12	N/A
d) ***	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material $\geq 5 \text{ M}\Omega$				N/A
9.7.3	Dielectric strength of the main circuit				N/A
	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				N/A
	a) 2000 V				N/A
	b) 2000 V				N/A
	c) 2000 V				N/A
Deleted **	d) 2000 V				N/A
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 $U = \text{___ V}$				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 $U = [1000 \text{ V if } U_i \leq 60 \text{ V or } 2U_i + 1000 \text{ V if } U_i \geq 60 \text{ V}]$				N/A
9.7.6	Verification of the impulse withstand voltage (across clearances and across solid insulation) and leakage current across open contacts				N/A
9.7.6.1	Verification of the impulse withstand voltage across open contacts (suitability for isolation)				N/A
	The 1,2/50 μs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum				N/A
	- rated impulse withstand voltage (kV) :				N/A
	- sea level of the laboratory:				N/A
	- test U_{imp} on open min contacts (equipment suitable for isolating) (see table 13)..... :				N/A
	- no unintentional disruptive discharge during the tests				N/A
9.7.6.2	Verification of impulse withstand voltage for the parts not test in 9.7.6.1				N/A
	The 1,2/50 μs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum				N/A
	- rated impulse withstand voltage (kV) :				N/A
	- sea level of the laboratory:				N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	- test Uimp min circuits (see table 14) :				N/A
	Application of test voltage				N/A
	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)				N/A
	- no unintentional disruptive discharge during the tests				N/A
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)				N/A
	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				N/A
	The leakage current flowing across the open contacts is measured and shall not exceed 2 mA				N/A
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, $\leq 1K/h$) Four-pole CB's: 1) three poles loaded 2) one pole and neutral pole loaded	63 A			P
	Ambient air temperature	22 °C			P
	Temperature rise [K]				P
	Terminals for external connections 60 K	B-10	B-11	B-12	P
	L1	58 K	57 K	58 K	
	L2	57 K	57 K	58 K	
	L3	58 K	57 K	57 K	
	L4 (N)	58 K	56 K	59 K	
	L3	57 K	57 K	58 K	
	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	B-10	B-11	B-12	P
		32 K	30 K	29 K	
	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	B-10	B-11	B-12	P
		47 K	42 K	45 K	

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Cl.	Requirement – Test	Result			Verdict
9.8.5	Measurement of power losses				P
	Power losses do not exceed the values stated in table 15	13 W			P
	Test current: $I_N = 63$ A (reach the steady state value) $U_n \geq 30$ V				P
	Loaded one pole after the other				P
	Max. power loss:	B-10	B-11	B-12	P
	L1	5,95 W	6,15 W	5,84 W	
	L2	5,45 W	5,82 W	5,63 W	
	L3	6,02 W	6,22 W	6,25 W	
	L4	5,86 W	5,60 W	6,10 W	
8.5	Uninterrupted duty				N/A
	Circuit-breakers operate reliable even after long service				N/A
9.9	28 day test				N/A
	28 cycles- 21 h with current - 3 h without current cross sectional area. 16 mm ²				N/A
	During the test no tripping during the last period, temperature rise shall be measured				N/A
	Ambient air temperature				N/A
	Parts Temperature rise [K]				N/A
	Terminals for external connections60	B-10	B-11	B-12	N/A
	Terminal L1 top side				N/A
	Terminal L1 bottom side				
	Terminal L2 top side				
	Terminal L2 bottom side				
	Terminal L3 top side				
	Terminal L3 bottom side				
	Terminal L4 top side				
	Terminal L4 bottom side				
	The temperature rise does not exceed the value measured during the temperature rise test (subclause 8.8) by more than 15 K				N/A
	Test current $1,45 I_N =$ ____ A				N/A
	- Tripping within	B-10	B-11	B-12	N/A
	- 1h (≤ 63 A)				
	- 2h (≥ 63 A)				

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „C“ 3 samples	type: D63 1P			P
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 242,6 V (rated voltage 240 V) Test Current 64,8 A (rated current 63 A) Power factor 0,89 (0,85-0,9) Cross sect. area 16 mm ²	242,6 V 64,8 A 0,89		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	
	- $I_N \geq 32$ 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 \pm 25 %			N/A	
	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	
	- undue wear			P	
	- discrepancy between the position of the moving contacts and corresponding position of the Indicating device	No discrepancy		P	
	- damage to the enclosure permitting access to live parts by test finger (see 9.6)	No damage		P	
	- loosening of electrical or mechanical connections	No loosen		P	
	- seepage of sealing compound			N/A	
	Moreover test current 2,55 I_N	160,7 A		P	
	Opening time not less 1 s or more than	C1-1	C1-2	C1-3	P
	- 60 s (≤ 32 A)				
	- 120 s (≥ 32 A)	25 s	32 s	19 s	
	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	

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Cl.	Requirement – Test	Result			Verdict	
	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': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P	
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A	
	Sequence: 6 x "O" and 3 x "CO"				P	
	I _{Peak} (A) max. value	C1-1	C1-2	C1-3	P	
		1,17 kA	1,18 kA	1,18 kA		
	Max. I ² t (kA ² s)	C1-1	C1-2	C1-3	P	
		L1	9,2	8,6		9,0
		L2				
		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	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.= 457 V. The circuit –breaker is in the open position The leakage current shall not exceed 2 mA	C1-1	C1-2	C1-3	P	
		L1	0,1 mA	0,1 mA		0,1 mA
		L2				
		L3				
		L4				
	Electric strength test:				P	
	Test voltage 1500 V (see 8.7.2)	1500 V			P	

IEC / EN 60898						
Cl.	Requirement – Test	Result	Verdict			
	a)		P			
	b)		N/A			
	c)		P			
Deleted **	d)		P			
d) ***	e) 2000 V		N/A			
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 tripping 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***	435,7 V	P			
	Power factor 0,93-0,98	0,93	P			
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm	P			
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A			
	Sequence: "O" + "CO" on each protected pole		P			
	Shifted point 30 ° on the other protected pole		P			
	I _{Peak} (A) max. value	C2-1	C2-2	C2-3	P	
		2,41 kA	2,44 kA	2,43 kA		
	Max. I ² t (kA ² s)	C2-1	C2-2	C2-3	P	
		L1	27,5	23,4		20,8
		L2				
		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	

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 $U_n = 457$ V. The circuit –breaker is in the open position The leakage current shall not exceed 2 mA	C2-1	C2-2	C2-3	P	
		L1	0,1 mA	0,1 mA		0,1 mA
		L2				
		L3				
		L4				
	Electric strength test:				P	
	Test voltage 1500 V (see 8.7.2)	1500 V			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
	TESTS „C“ 3 samples	type: D63 2P	P
8.7	Mechanical and electrical endurance		N/A
	Circuit-breaker shall be capable to perform an adequate number of cycles with rated current		N/A
9.11.1	General test conditions		N/A
	Test: Test Voltage V (rated voltage 230 V) Test Current A (rated current 63 A) Power factor (0,85-0,9) Cross sect. area mm ² Remark: single pole CBs of 230/400 V tested at 230 V***		N/A
9.11.2	Test procedure		N/A
	The circuit-breaker is submitted to 4000 operating cycles with rated current.		N/A
	- $I_N \leq 32$ A: 2 s on – 13 s off		N/A
	- $I_N \geq 32$ A: 2 s on – 28 s off		N/A
	CBs with dependent manual operation the operating speed shall be 0,1 m/s \pm 25 %		N/A
	During the test the circuit-breaker shall be operated as in normal use.		N/A
9.11.3	Condition of the circuit-breaker after the test		N/A
	Following the test 9.11.2 the sample shall not show:		N/A
	- undue wear		N/A
	- discrepancy between the position of the moving contacts and corresponding position of the Indicating device		N/A
	- damage to the enclosure permitting access to live parts by test finger (see 9.6)		N/A
	- loosening of electrical or mechanical connections		N/A
	- seepage of sealing compound		N/A
	Moreover test current 2,55 I_N		N/A
	Opening time not less 1 s or more than		N/A
	- 60 s (≤ 32 A)		
	- 120 s (≥ 32 A)		
	Dielectric strength reduced to according 9.7.3 but at a voltage 500 V less than prescribed in 9.7.5** or 900 V***		N/A
9.12.11.2	Test at reduced short-circuit currents		N/A
9.12.11.2.1	Test on all circuit-breakers		N/A

IEC / EN 60898				
Cl.	Requirement – Test	Result	Verdict	
9.12.11.2.1	Test at reduced short-circuit currents: Fig. 3		N/A	
	Test current:		N/A	
	- 500 A or 10 In		N/A	
	Test voltage 1,05 Un** or 1,1 Un***		N/A	
	Power factor 0,93-0,98		N/A	
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A	
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A	
	Sequence: 6 x "O" and 3 x "CO"		N/A	
	I _{Peak} (A) max. value		N/A	
		L1		
		L2		
		L3		
		L4		
	Max. I ² t		N/A	
		L1		
		L2		
		L3		
		L4		
	- No permanent arcing		N/A	
	- No flash-over between poles or between poles and frame		N/A	
	- No blowing of the fuses F and F'		N/A	
	- Polyethylene foil shows no holes		N/A	
	After the test:		N/A	
9.12.12	Verification of the circuit-breaker after short-circuit tests		N/A	
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.		N/A	
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit –breaker is in the open position The leakage current shall not exceed 2 mA		N/A	
		L1		
		L2		
		L3		
		L4		

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Cl.	Requirement – Test	Result	Verdict
	Electric strength test:		N/A
	Test voltage 1500 V (see 8.7.2)		N/A
	a)		N/A
	b)		N/A
	c)		N/A
Deleted **	d)		N/A
d) ***	e) 2000 V		N/A
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 tripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A	1549,9 A	
	Test voltage 1,05 Un** or 1,1 Un***	435,7 V	P
	Power factor 0,93-0,98	0,93	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm	P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	Sequence: "O" + "CO" on each protected pole		P
	Shifted point 30 ° on the other protected pole		P
	I_{Peak} (A) max. value	C2-4 C2-5	P
	L1	2,10 kA 2,09 kA	
	L2	2,39 kA 2,45 kA	
	L3		
	L4		
	Max. I^2t (kA ² s)	C2-4 C2-5	P
	L1	17,4 16,4	
	L2	19,7 22,4	
	L3		
	L4		
	No permanent arcing		P
	No flash-over between poles or between poles and frame		P

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	- 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 $U_n = 457$ V. The circuit –breaker is in the open position The leakage current shall not exceed 2 mA	C2-4 C2-5	P
	L1	0,1 mA 0,1 mA	
	L2	0,1 mA 0,1 mA	
	L3		
	L4		
	Electric strength test:		P
	Test voltage 1500 V (see 8.7.2)	1500 V	P
	a)		P
	b)		P
	c)		P
Deleted **	d)		P
d)***	e) 2000 V		N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „C“ 3 samples	type: D63 4P	P
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 422 V (rated voltage 400 V) Test Current 64,2 A (rated current 63 A) Power factor 0,88 (0,85-0,9) Cross sect. area 16 mm ² Remark: single pole CBs of 230/400 V tested at 230 V***	422 V 64,2 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
	- $I_N \geq 32$ 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 \pm 25 %		N/A
	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
	- undue wear		P
	- discrepancy between the position of the moving contacts and corresponding position of the Indicating device	No discrepancy	P
	- damage to the enclosure permitting access to live parts by test finger (see 9.6)	No damage	P
	- loosening of electrical or mechanical connections	No loosen	P
	- seepage of sealing compound		N/A
	Moreover test current 2,55 I_N	161 A	P
	Opening time not less 1 s or more than	C1-4 C1-5 C1-6	P
	- 60 s (≤ 32 A)		
	- 120 s (≥ 32 A)	29 s 18 s 35 s	
	Dielectric strength reduced to according 9.7.3 but at a voltage 500 V less than prescribed in 9.7.5** or 900 V***	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

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Cl.	Requirement – Test	Result			Verdict	
9.12.11.2.1	Test at reduced short-circuit currents: Fig. 3				P	
	Test current:	Obtained			P	
	- 500 A or 10 In	634,8 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': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P	
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A	
	Sequence: 6 x "O" and 3 x "CO"				P	
	I _{Peak} (A) max. value		C1-4	C1-5	C1-6	P
		L1	1,19 kA	1,20 kA	1,20 kA	
		L2	1,20 kA	1,18 kA	1,20 kA	
		L3	1,20 kA	1,17 kA	1,20 kA	
		L4	1,20 kA	1,18 kA	1,20 kA	
	Max. I ² t (kA ² s)		C1-4	C1-5	C1-6	P
		L1	8,41	27,4	8,29	
		L2	9,62	8,76	8,54	
		L3	6,35	28,40	8,30	
		L4	6,42	8,31	9,10	
	- 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	
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit –breaker is in the open position The leakage current shall not exceed 2 mA		C1-4	C1-5	C1-6	P
		L1	0,1 mA	0,1 mA	0,1 mA	
		L2	0,1 mA	0,1 mA	0,1 mA	
		L3	0,1 mA	0,1 mA	0,1 mA	

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Cl.	Requirement – Test	Result			Verdict	
		L4	0,1 mA	0,1 mA	0,1 mA	
	Electric strength test:					P
	Test voltage 1500 V (see 8.7.2)		1500 V			P
	a)					P
	b)					P
	c)					P
Deleted **	d)					P
d) ***	e) 2000 V					N/A
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 tripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A		1549,9 A			
	Test voltage 1,05 Un** or 1,1 Un***		435,7 V			P
	Power factor 0,93-0,98		0,93			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm		"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm					N/A
	Sequence: "O" + "CO" on each protected pole					P
	Shifted point 30 ° on the other protected pole					P
	I _{Peak} (A) max. value	C2-6			P	
		L1	2,21 kA			
		L2	2,37 kA			
		L3	2,41 kA			
		L4	2,37 kA			
	Max. I ² t (kA ² s)	C2-6			P	
		L1	18,7			
		L2	19,9			
		L3	21,9			
		L4	21,9			
	No permanent arcing					P
	No flash-over between poles or between poles and frame					P

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Cl.	Requirement – Test	Result	Verdict
	- 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 $U_n = 457$ V. The circuit –breaker is in the open position The leakage current shall not exceed 2 mA	C2-6	P
	L1	0,1 mA	
	L2	0,1 mA	
	L3	0,1 mA	
	L4	0,1 mA	
	Electric strength test:		P
	Test voltage 1500 V (see 8.7.2)	1500 V	P
	a)		P
	b)		P
	c)		P
Deleted **	d)		P
d)***	e) 2000 V		N/A

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Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 3 samples	type: 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		P
	I_N	63 A	P
	Sect. (mm ²)	16 mm ²	P
	Instantaneous tripping current	<input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> 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 ($I_N \geq 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	91,4 A	P
	- Tripping within	D0+D1-1 D0+D1-2 D0+D1-3	P
	1h (≤ 63 A)	12 s 139 s 201 s	
	2h (≥ 63 A)		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	160,5 A	P
	opening time not less than 1 s or more than	D0+D1-1 D0+D1-2 D0+D1-3	P
	60 s		
	120 s	19 s 18 s 24 s	
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 U_n (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	<input type="checkbox"/> For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold				N/A
	Opening time:				N/A
	- 0,1 s ** / $0,1s \leq t \leq 45s (\leq 32A)^{***}$				N/A
	- 0,1 s ** / $0,1s \leq t \leq 90s (\geq 32A)^{***}$				N/A
	Test current $5I_N$ (A), starting from cold				N/A
	Tripping less than:				N/A
	0,1 s				N/A
9.10.1.2	Test current $2,55I_N$ (A) starting from cold for:				N/A
	opening time not less than 1 s or more than				N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	<input type="checkbox"/> For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold				N/A
	Opening time:				N/A
	- 0,1 s ** / $0,1s \leq t \leq 15s (\leq 32A)^{***}$				
	- 0,1 s ** / $0,1s \leq t \leq 30s (\geq 32A)^{***}$				
	Test current $10I_N$ (A), starting from cold				N/A
	Tripping less than 0,1 s				N/A
9.10.1.2	Test current $2,55I_N$ (A) starting from cold for:				N/A
	opening time not less than 1 s or more than				N/A
	- 60 s				
	- 120 s				
9.10.2.4	<input checked="" type="checkbox"/> For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	630 A			P
	Opening time:	D0+D1-1	D0+D1-2	D0+D1-3	P
	- 0,1 s ** / $0,1s \leq t \leq 4s (\leq 32A)^{***}$				N/A
	- $0,1s \leq t \leq 8s (\geq 32A)^{***}$	8 s	7 s	9 s	P
	Test current $20I_N$ (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	D0+D1-1	D0+D1-2	D0+D1-3	P
		19 ms	7 ms	5,6 ms	P
9.10.1.2	Test current $2,55I_N$ (A) starting from cold for:***	160,7 A			P
	opening time not less than 1 s or more than				P

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Cl.	Requirement – Test	Result			Verdict
	- 60 s				N/A
	- 120 s	20 s	15 s	22 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				N/A
	Tripping within				N/A
	- 1h				
	- 2h				
	Test current 1,2 It (A), (three pole or four pole) starting from cold				N/A
	Tripping within				N/A
	- 1h				
	- 2h				
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of $(35 \pm 2)^\circ\text{C}$ 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 <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	D0+D1-1	D0+D1-2	D0+D1-3	P
		201 s	316 s	329 s	
	b) Ambient temperature of $(40 \pm 2)^\circ\text{C}$	40 °C			P
	Test current I _N (A)	63 A			P
	No tripping within				P
	- 1h				P
	- 2h				N/A
	Tests: D1				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

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Cl.	Requirement – Test	Result	Verdict
	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)	1549 A	P
	Power factor	0,94	P
	Test voltage 1,05 Un** or 1,1 Un ***	253,7 V	P
	Test circuit: figure	Figure 3 for 6O + 2CO Figure 5 for last O	P
	t (min)	3 min	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm	P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	Sequence	6O + 2CO + O	P
	I _{Peak} (A) max. value	D0+D1-1 D0+D1-2 D0+D1-3	P
		2,05 kA 2,04 kA 2,01 kA	

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Cl.	Requirement – Test	Result			Verdict	
	$I^2t \leq 16 \text{ kA}^2\text{s}$				P	
	Max. I^2t (kA^2s)	D0+D1-1	D0+D1-2	D0+D1-3	P	
		L1	16,0	13,2		12,4
		L2				
		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 $U_n = 457 \text{ V}$. The circuit-breaker is in the open position The leakage current shall not exceed 2 mA	D0+D1-1	D0+D1-2	D0+D1-3	P	
	L1	0,1 mA	0,1 mA	0,1 mA		
	L2					
	L3					
	L4					
	Electric strength test:				P	
	Test voltage 1500 V (see 8.7.2)	1500 V			P	
	a)				P	
	b)				N/A	
	c)				P	
Deleted **	d)				P	
d) ***	e) 2000 V				N/A	
	Test current $0.85 \times$ 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 $1,1 \times$ tripping current ($1,45 I_N$) within 5s	100,5 A			P	
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	D0+D1-1	D0+D1-2	D0+D1-3	P	

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
		222 s	197 s	145 s	

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „D“ 3 samples	type: 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		P
	I_N	63 A	P
	Sect. (mm ²)	16 mm ²	P
	Instantaneous tripping current	<input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> 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 ($I_N \geq 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	91,4 A	P
	- Tripping within	D0+D1-4 D0+D1-5 D0+D1-6	P
	1h (≤ 63 A)	89 s 78 s 144 s	
	2h (≥ 63 A)		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	161 A	P
	opening time not less than 1 s or more than	D0+D1-4 D0+D1-5 D0+D1-6	P
	60 s		
	120 s	34 s 27 s 56 s	
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 U_n (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	<input type="checkbox"/> For circuit-breakers of the B – Type				N/A
	Test current $3I_N$ (A), starting from cold				N/A
	Opening time:				N/A
	- 0,1 s ** / $0,1s \leq t \leq 45s (\leq 32A)^{***}$				N/A
	- 0,1 s ** / $0,1s \leq t \leq 90s (\geq 32A)^{***}$				N/A
	Test current $5I_N$ (A), starting from cold				N/A
	Tripping less than:				N/A
	0,1 s				N/A
9.10.1.2	Test current $2,55I_N$ (A) starting from cold for:				N/A
	opening time not less than 1 s or more than				N/A
	- 60 s				N/A
	- 120 s				N/A
9.10.2.3	<input type="checkbox"/> For circuit-breakers of the C – Type				N/A
	Test current $5I_N$ (A), starting from cold				N/A
	Opening time:				N/A
	- 0,1 s ** / $0,1s \leq t \leq 15s (\leq 32A)^{***}$				
	- 0,1 s ** / $0,1s \leq t \leq 30s (\geq 32A)^{***}$				
	Test current $10I_N$ (A), starting from cold				N/A
	Tripping less than 0,1 s				N/A
9.10.1.2	Test current $2,55I_N$ (A) starting from cold for:				N/A
	opening time not less than 1 s or more than				N/A
	- 60 s				
	- 120 s				
9.10.2.4	<input checked="" type="checkbox"/> For circuit-breakers of the D – Type				P
	Test current $10I_N$ (A), starting from cold	630 A			P
	Opening time:	D0+D1-4 D0+D1-5 D0+D1-6			P
	- 0,1 s ** / $0,1s \leq t \leq 4s (\leq 32A)^{***}$				N/A
	- $0,1s \leq t \leq 8s (\geq 32A)^{***}$	4 s	5s	7s	P
	Test current $20I_N$ (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	D0+D1-4 D0+D1-5 D0+D1-6			P
		24 ms	39 ms	17 ms	P
9.10.1.2	Test current $2,55I_N$ (A) starting from cold for:***	160,7A			P
	opening time not less than 1 s or more than	D0+D1-4 D0+D1-5 D0+D1-6			P

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Cl.	Requirement – Test	Result			Verdict
	- 60 s				N/A
	- 120 s	29 s	26 s	48 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				N/A
	Tripping within				N/A
	- 1h				
	- 2h				
	Test current 1,2 It (A), (three pole or four pole) starting from cold	109,6 A			P
	Tripping within				P
	- 1h	D0+D1-4	D0+D1-5	D0+D1-6	
	L1	198 s	171 s	207 s	
	L2	89 s	250 s	48 s	
	L3	59 s	228 s	149 s	
	L4(N)	182 s	58 s	219 s	
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of $(35 \pm 2)^\circ\text{C}$ 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 <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	D0+D1-4	D0+D1-5	D0+D1-6	P
		116 s	73 s	139 s	
	b) Ambient temperature of $(40 \pm 2)^\circ\text{C}$	40 °C			P
	Test current I _N (A)	63 A			P
	No tripping within				P
	- 1h				P
	- 2h				N/A

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Cl.	Requirement – Test	Result	Verdict
	Tests: D1		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°		
	- 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)	1534 A	P
	Power factor	0,95	P
	Test voltage 1,05 Un** or 1,1 Un ***	443,8 V	P
	Test circuit: figure	Figure 6	P
	t (min)	3 min	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 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': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	Sequence	6O + 3CO, normal connection	P
	I_{Peak} (kA) max. value	D0+D1-4 D0+D1-5 D0+D1-6 2,09 2,11 1,87	P
	$I^2t \leq 13,3 \text{ kA}^2\text{s}$		P
	Max. I^2t (kA ² s)	D0+D1-4 D0+D1-5 D0+D1-6 L1 13,2 13,0 12,9 L2 10,7 13,0 0,009 L3 13,3 12,2 12,5 L4	P
	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	D0+D1-7 D0+D1-8 D0+D1-9 2,65 kA 2,09 kA 2,22 kA	P
	$I^2t \leq 19,2 \text{ kA}^2\text{s}$		P
	Max. I^2t (kA ² s)	D0+D1-7 D0+D1-8 D0+D1-9 L1 12,9 13,0 L2 12,5 15,0 L3 19,2 15,1 L4 12,3 15,5 15,9	P
	- No permanent arcing		P
	- No flash-over between poles or between poles and frame		P
	- No blowing of the fuses F and F'		P
	- Polyethylene foil shows no holes		P
	After the test:		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 $U_n = 457 \text{ V}$. The circuit-breaker is in the open position The leakage current shall not exceed 2 mA	D0+D1-4 D0+D1-5 D0+D1-6	P

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Cl.	Requirement – Test	Result			Verdict	
		L1	0,1 mA	0,1 mA	0,1 mA	
		L2	0,1 mA	0,1 mA	0,1 mA	
		L3	0,1 mA	0,1 mA	0,1 mA	
		L4	0,1 mA	0,1 mA	0,1 mA	
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times $U_n = 457$ V. The circuit –breaker is in the open position The leakage current shall not exceed 2 mA		D0+D1-7	D0+D1-8	D0+D1-9	P
		L1	0,1 mA	0,1 mA	0,1 mA	
		L2	0,1 mA	0,1 mA	0,1 mA	
		L3	0,1 mA	0,1 mA	0,1 mA	
		L4	0,1 mA	0,1 mA	0,1 mA	
	Electric strength test:					P
	Test voltage 1500 V (see 8.7.2)		1500 V			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
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour		D0+D1-4	D0+D1-5	D0+D1-6	P
			113 s	261 s	136 s	
			D0+D1-7	D0+D1-8	D0+D1-9	
			139 s	172 s	59 s	

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Cl.	Requirement – Test	Result			Verdict
	TESTS „D“	D type, 1 for all other rated current B, C type, 1 for all rated current (only 9.10.2 for B and C type)			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				P
	I_N	D0-1	D0-2	D0-3	P
		D1	D2	D3	
		D0-4	D0-5	D0-6	
		D4	D5	D6	
		D0-7	D0-8	D0-9	
		D10	D13	D15	
		D0-10	D0-11	D0-12	
		D16	D20	D25	
		D0-13	D0-14	D0-15	
		D32	D40	D50	
		D0-16	D0-17	D0-18	
		B1	B2	B3	
		D0-19	D0-20	D0-21	
		B4	B5	B6	
		D0-22	D0-23	D0-24	
		B10	B13	B15	
		D0-25	D0-26	D0-27	
		B16	B20	B25	
		D0-28	D0-29	D0-30	
		B32	B40	B50	
	D0-31	D0-32	D0-33		
	B63	C1	C2		
	D0-34	D0-35	D0-36		
	C3	C4	C5		
	I_N	D0-37	D0-38	D0-39	P

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Cl.	Requirement – Test	Result			Verdict
		C6	C10	C13	
		D0-40	D0-41	D0-42	
		C15	C16	C20	
		D0-43	D0-44	D0-45	
		C25	C32	C40	
		D0-46	D0-47		
		C50	C63		
	Sect. (mm ²)	D0-1	D0-2	D0-3	P
		1 mm ²	1 mm ²	1 mm ²	
		D0-4	D0-5	D0-6	
		1 mm ²	1 mm ²	1 mm ²	
		D0-7	D0-8	D0-9	
		1,5 mm ²	1,5 mm ²	2,5 mm ²	
		D0-10	D0-11	D0-12	
		2,5 mm ²	2,5 mm ²	4 mm ²	
		D0-13	D0-14	D0-15	
		6 mm ²	10 mm ²	10 mm ²	
		D0-16	D0-17	D0-18	
		1 mm ²	1 mm ²	1 mm ²	
		D0-19	D0-20	D0-21	
		1 mm ²	1 mm ²	1 mm ²	
		D0-22	D0-23	D0-24	
		1,5 mm ²	1,5 mm ²	2,5 mm ²	
		D0-25	D0-26	D0-27	
		2,5 mm ²	2,5 mm ²	4 mm ²	
		D0-28	D0-29	D0-30	
		6 mm ²	10 mm ²	10 mm ²	
		D0-31	D0-32	D0-33	
		16 mm ²	1 mm ²	1 mm ²	
		D0-34	D0-35	D0-36	
		1 mm ²	1 mm ²	1 mm ²	
		D0-37	D0-38	D0-39	
		1 mm ²	1,5 mm ²	1,5 mm ²	
		D0-40	D0-41	D0-42	
		2,5 mm ²	2,5 mm ²	2,5 mm ²	
	Sect. (mm ²)	D0-43	D0-44	D0-45	P
		4 mm ²	6 mm ²	10 mm ²	

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Cl.	Requirement – Test	Result			Verdict
		D0-46	D0-47		
		10 mm ²	16 mm ²		
	Instantaneous tripping current	<input checked="" type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input checked="" type="checkbox"/> 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:	D0-1	D0-2	D0-3	P
		1,13 A	2,26 A	3,39 A	
		D0-4	D0-5	D0-6	
		4,52 A	5,65 A	6,78 A	
		D0-7	D0-8	D0-9	
		11,3 A	14,7 A	16,69 A	
		D0-10	D0-11	D0-12	
		18,1 A	22,6 A	28,3 A	
		D0-13	D0-14	D0-15	
		36,2 A	45,2 A	56,5 A	
	- 1 h (I _N ≤ 63 A)				P
	- 2 h (I _N ≥ 63 A)				N/A
	No tripping				P
	Then steadily increased within 5 s to 1,45 I _N (A)	D0-1	D0-2	D0-3	P
		1,45 A	2,9 A	4,35 A	
		D0-4	D0-5	D0-6	
		5,8 A	7,25 A	8,7 A	
		D0-7	D0-8	D0-9	
		14,5 A	18,9 A	21,8 A	
		D0-10	D0-11	D0-12	
		23,2 A	29 A	36,3 A	
		D0-13	D0-14	D0-15	
		46,4 A	58 A	72,5 A	
	- Tripping within				P
	1h (≤ 63 A)	D0-1	D0-2	D0-3	P
		77 s	114 s	139 s	
		D0-4	D0-5	D0-6	
		37 s	56 s	12 s	
		D0-7	D0-8	D0-9	
		84 s	197 s	209 s	
		D0-10	D0-11	D0-12	
		76 s	143 s	59 s	

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Cl.	Requirement – Test	Result			Verdict
	1h (\leq 63 A)	D0-13	D0-14	D0-15	P
		79 s	56 s	34 s	
	2h (\geq 63 A)				N/A
9.10.1.2	Test current $2,55 I_N$ (A) starting from cold for:	D0-1	D0-2	D0-3	P
		2,55 A	5,1 A	7,65 A	
		D0-4	D0-5	D0-6	
		10,2 A	12,8 A	15,3 A	
		D0-7	D0-8	D0-9	
		25,5 A	33,2 A	38,3 A	
		D0-10	D0-11	D0-12	
		40,8 A	51 A	63,8	
		D0-13	D0-14	D0-15	
		81,6 A	102 A	127,5 A	
	opening time not less than 1 s or more than				P
	- 60 s	D0-1	D0-2	D0-3	
		15 s	19 s	21 s	
		D0-4	D0-5	D0-6	
		8 s	11 s	54 s	
		D0-7	D0-8	D0-9	
		34s	47 s	49 s	
		D0-10	D0-11	D0-12	
		21 s	34 s	15 s	
		D0-13			
	24 s				
	- 120 s	D0-14	D0-15		P
		34 s	31 s		
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 U_n (phase to neutral) with a power factor between 0,95 and 1.				P
	The sequence of operation is : O-CO-CO-CO Interval time: \geq 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	<input checked="" type="checkbox"/> For circuit-breakers of the B – Type				P
	Test current $3I_N$ (A), starting from cold	D0-16	D0-17	D0-18	P
		3 A	6 A	9 A	
		D0-19	D0-20	D0-21	
		12 A	15 A	18 A	
		D0-22	D0-23	D0-24	
		30 A	39 A	45 A	
		D0-25	D0-26	D0-27	
		48 A	60 A	75 A	
		D0-28	D0-29	D0-30	
		96 A	120 A	150 A	
		D0-31			
	189 A				
	Opening time:				P
	- 0,1 s ** / $0,1s \leq t \leq 45s (\leq 32A)^{***}$				
	- 0,1 s ** / $0,1s \leq t \leq 90s (\geq 32A)^{***}$				
	Test current $5 I_N$ (A), starting from cold	D0-16	D0-17	D0-18	P
		5 A	10 A	15 A	
		D0-19	D0-20	D0-21	
		20 A	25 A	30 A	
		D0-22	D0-23	D0-24	
		50 A	65 A	75 A	
		D0-25	D0-26	D0-27	
		80 A	100 A	125 A	
		D0-28	D0-29	D0-30	
		160 A	200 A	250 A	
		D0-31			
	315 A				
	Tripping less than 0,1 s	D0-16	D0-17	D0-18	P
		7,7 ms	6,9 ms	11 ms	
		D0-19	D0-20	D0-21	
		9,8 ms	7,9 ms	10,2 ms	
		D0-22	D0-23	D0-24	
		13,1 ms	9,9 ms	6,7 ms	

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Cl.	Requirement – Test	Result			Verdict
	Tripping less than 0,1 s	D0-25	D0-26	D0-27	P
		8,9 ms	10 ms	9,8 ms	
		D0-28	D0-29	D0-30	
		10 ms	6,9 ms	8,8 ms	
		D0-31			
		9,1 ms			
9.10.1.2	Test current $2,55 I_N$ (A) starting from cold for:				N/A
	opening time not less than 1 s or more than				N/A
	- 60 s				N/A
	- 120 s				
9.10.2.3	<input checked="" type="checkbox"/> For circuit-breakers of the C – Type				P
	Test current $5I_N$ (A), starting from cold	D0-32	D0-33	D0-34	P
		5 A	10 A	15 A	
		D0-35	D0-36	D0-37	
		20 A	25 A	30 A	
		D0-38	D0-39	D0-40	
		50 A	65 A	75 A	
		D0-41	D0-42	D0-43	
		80 A	100 A	125 A	
	Test current $5I_N$ (A), starting from cold	D0-44	D0-45	D0-46	P
		160 A	200 A	250 A	
		D0-47			
		315 A			
	Opening time:				P
	- 0,1 s ** / $0,1s \leq t \leq 15s (\leq 32A)^{***}$				
	- 0,1 s ** / $0,1s \leq t \leq 30s (\geq 32A)^{***}$				
	Test current $10 I_N$ (A), starting from cold	D0-32	D0-33	D0-34	P
		10 A	20 A	30 A	
		D0-35	D0-36	D0-37	
		40A	50 A	60 A	
		D0-38	D0-39	D0-40	
		100 A	130 A	150 A	
		D0-41	D0-42	D0-43	
		160 A	200 A	250 A	
		D0-44	D0-45	D0-46	
320 A	400 A	500 A			

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Cl.	Requirement – Test	Result			Verdict
	Test current $10 I_N$ (A), starting from cold	D0-47			P
		630 A			
	Tripping less than 0,1 s	D0-32	D0-33	D0-34	P
		9,7 ms	12 ms	11,2 ms	
		D0-35	D0-36	D0-37	
		10,9 ms	13 ms	10,1 ms	
		D0-38	D0-39	D0-40	
		6,9 ms	12 ms	9,7 ms	
		D0-41	D0-42	D0-43	
		11,3 ms	13 ms	10 ms	
		D0-44	D0-45	D0-46	
		10,7 ms	11 ms	6,8 ms	
		D0-47			
		10 ms			
9.10.1.2	Test current $2,55 I_N$ (A) starting from cold for:				N/A
	opening time not less than 1 s or more than				N/A
	- 60 s				N/A
	- 120 s				
9.10.2.4	<input checked="" type="checkbox"/> For circuit-breakers of the D – Type				P
	Test current $10 I_N$ (A), starting from cold	D0-1	D0-2	D0-3	P
		10 A	20A	30 A	
		D0-4	D0-5	D0-6	
		40 A	50 A	60 A	
		D0-7	D0-8	D0-9	
		100 A	130 A	150 A	
		D0-10	D0-11	D0-12	
		160 A	200 A	250 A	
		D0-13	D0-14	D0-15	
		320 A	400 A	500 A	
	Opening time:				P
	- 0,1 s ** / $0,1s \leq t \leq 4s (\leq 32A,)^{***}$				P
	- 0,1 s ** / $0,1s \leq t \leq 8s (\geq 32A,)^{***}$				P
	Test current $20 I_N$ (A) or to the maximum instantaneous tripping current(see cl. 6, item j)** , starting from cold	Tested at $20 I_N$			P
		D0-1	D0-2	D0-3	
		20 A	40 A	60 A	

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Cl.	Requirement – Test	Result			Verdict
		D0-4	D0-5	D0-6	
		80 A	100 A	120 A	
		D0-7	D0-8	D0-9	
		200 A	260 A	300 A	
		D0-10	D0-11	D0-12	
		320 A	400 A	500 A	
		D0-13	D0-14	D0-15	
		640 A	800 A	1000 A	
	Tripping less than 0,1 s	D0-1	D0-2	D0-3	P
		3,1 ms	7,9 ms	6,7 ms	
		D0-4	D0-5	D0-6	
		3,4 ms	3,9 ms	3,8 ms	
		D0-7	D0-8	D0-9	
		8,1 ms	9,8 ms	4,9 ms	
		D0-10	D0-11	D0-12	
		11 ms	11,1 ms	7,3 ms	
		D0-13	D0-14	D0-15	
		8,4 ms	7,8 ms	7,6 ms	
9.10.1.2	Test current 2,55 I _N (A) starting from cold for:***				P
	opening time not less than 1 s or more than				P
	- 60 s	D0-1	D0-2	D0-3	P
		13 s	18 s	20 s	
		D0-4	D0-5	D0-6	
		9 s	10 s	39 s	
		D0-7	D0-8	D0-9	
		32 s	45 s	43 s	
		D0-10	D0-11	D0-12	
		19 s	30 s	17 s	
		D0-13			
		25 s			
	- 120 s	D0-14	D0-15		P
		32 s	29 s		
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A
	Test current 1,1 I _t (A), (two pole) starting from cold				N/A
	Tripping within				N/A

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Cl.	Requirement – Test	Result			Verdict
	- 1h				N/A
	- 2h				
	Test current 1,2 I _t (A), (three pole or four pole) starting from cold				N/A
	Tripping within				N/A
	- 1h				
	- 2h				
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)	D0-1	D0-2	D0-3	P
		1,13 A	2,26 A	3,39 A	
		D0-4	D0-5	D0-6	
		4,52 A	5,65 A	6,78 A	
		D0-7	D0-8	D0-9	
		11,3 A	14,7 A	16,9 A	
		D0-10	D0-11	D0-12	
		18,1 A	22,6 A	28,3 A	
		D0-13	D0-14	D0-15	
	36,2 A	45,2 A	65,0		
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 I _N (A) within 5s	D0-1	D0-2	D0-3	P
		1,9 A	3,8 A	5,7 A	
		D0-4	D0-5	D0-6	
		7,6 A	9,5 A	11,4 A	
		D0-7	D0-8	D0-9	
		19,0 A	24,7 A	28,5 A	
		D0-10	D0-11	D0-12	
		30,4 A	38,0 A	47,5 A	
		D0-13	D0-14	D0-15	
	60,8 A	76,0 A	95,0 A		
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	D0-1	D0-2	D0-3	P
		79 s	94 s	137 s	
		D0-4	D0-5	D0-6	
		54 s	58 s	21 s	

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Cl.	Requirement – Test	Result			Verdict
		D0-7	D0-8	D0-9	P
		76 s	139 s	176 s	
		D0-10	D0-11	D0-12	
		57 s	78 s	57 s	
		D0-13	D0-14	D0-15	
		115 s	84 s	138 s	
	b) Ambient temperature of $(40 \pm 2)^\circ\text{C}$	40 °C			P
	Test current I_N (A)	D0-1	D0-2	D0-3	P
		1 A	2 A	3 A	
		D0-4	D0-5	D0-6	
		4 A	5 A	6 A	
		D0-7	D0-8	D0-9	
		10 A	13 A	15 A	
		D0-10	D0-11	D0-12	
		16 A	20 A	25 A	
		D0-13	D0-14	D0-15	
		32 A	40 A	50 A	
	No tripping within				P
	- 1h				P
	- 2h				N/A

IEC / EN 60898						
Cl.	Requirement – Test	Result			Verdict	
	TESTS „E“ 3 samples	Type: D63 1P			P	
9.12.11.4.2	Test: E1 (Test at service short-circuit capacity)				P	
	Service short-circuit capacity.....:	7500 A			P	
	Test circuit: figure.....:	Figure 3			P	
	Prospective current.....:	7500 A			P	
	Prospective current obtained.....:	7530 A			P	
	Test voltage 1,05 Un** or 1,1 Un ***	253,6 V			P	
	Power factor.....:	0,45~0,50			P	
	Power factor obtained.....:	0,50			P	
	Sequence.....:	Table 19 in IEC/EN 60898			P	
	T (min).....:	3 min			P	
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm			P	
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A	
	I _{Peak} (kA) max. value:	4,78			P	
	I ² t ≤ 38,1 kA ² s				P	
	Max. I ² t (kA ² s)	E1-1	E1-2	E1-3	P	
		L1	56,0	61,0		68,9
		L2				
		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. = 264 V. The circuit –breaker is in the open position				P	
	The leakage current shall not exceed 2 mA	E1-1	E1-2	E1-3	P	

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Cl.	Requirement – Test	Result			Verdict	
		L1	0,1 mA	0,1 mA	0,1 mA	P
		L2				
		L3				
		L4				
	Electric strength test:				P	
	Test voltage 1500 V (see 8.7.2)	1500 V			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	
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	E1-1	E1-2	E1-3	P	
		138 s	46 s	87 s		

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Cl.	Requirement – Test	Result	Verdict
	TESTS „E“ 3 samples In the case of three-phase tests for single circuit-breakers	Type: D63 1P	P
9.12.11.4.2	Test: E1 (Test at service short-circuit capacity)		P
	Service short-circuit capacity.....:	7500 A	P
	Test circuit: figure	Figure 5	P
	Prospective current.....:	7500 A	P
	Prospective current obtained.....:	7530 A	P
	Test voltage 1,05 Un** or 1,1 Un ***	453,2 V	P
	Power factor	0,45~0,5	P
	Power factor obtained.....:	0,46	P
	Sequence.....:	See remarks	P
	T (min)	3 min	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm	P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	I _{Peak} (kA) max. value:	9,01	P
	I ² t ≤ 370,6 kA ² s		P
	Max. I ² t(kA ² s)	E1-4 E1-5 E1-6	P
	L1	158,9	
	L2		370,6
	L3		100,5
	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.= 253 V. The circuit –breaker is in the open position		P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	The leakage current shall not exceed 2 mA	E1-4	E1-5	E1-6	P
	L1	0,1 mA	0,1 mA	0,1 mA	
	L2				
	L3				
	L4				
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)	1500 V			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
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	E1-4	E1-5	E1-6	P
		58 s	38 s	49 s	

IEC / EN 60898						
Cl.	Requirement – Test	Result			Verdict	
	TESTS „E“ 3 samples	Type: D1 1P			P	
9.12.11.4.2	Test: E1 (Test at service short-circuit capacity)				P	
	Service short-circuit capacity.....:	7500 A			P	
	Test circuit: figure.....:	Figure 3			P	
	Prospective current.....:	7500 A			P	
	Prospective current obtained.....:	7530 A			P	
	Test voltage 1,05 Un** or 1,1 Un ***	253,6 V			P	
	Power factor.....:	0,45~0,5			P	
	Power factor obtained.....:	0,50			P	
	Sequence.....:	Table 19 in IEC/EN 60898			P	
	T (min).....:	3 min			P	
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm			P	
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A	
	I _{Peak} (A) max. value:	945,6 A			P	
	I ² t ≤ 1,19 kA ² s				P	
	Max. I ² t(kA ² s)	E1-7 E1-8 E1-9			P	
		L1	1,19	1,00		0,80
		L2				
		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. = 253 V. The circuit –breaker is in the open position				P	
	The leakage current shall not exceed 2 mA	E1-7	E1-8	E1-9	P	

IEC / EN 60898						
Cl.	Requirement – Test	Result			Verdict	
		L1	0,1 mA	0,1 mA	0,1 mA	
		L2				
		L3				
		L4				
	Electric strength test:					P
	Test voltage 1500 V (see 8.7.2)		1500 V			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)		0,96 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		1,6 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour		E1-7	E1-8	E1-9	P
			77 s	58 s	46 s	

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „E“ 3 samples In the case of three-phase tests for single circuit-breakers	Type: D1 1P	P
9.12.11.4.2	Test: E1 (Test at service short-circuit capacity)		P
	Service short-circuit capacity.....:	7500 A	P
	Test circuit: figure	Figure 5	P
	Prospective current.....:	7500 A	P
	Prospective current obtained.....:	7560 A	P
	Test voltage 1,05 Un** or 1,1 Un ***	427 V	P
	Power factor	0,45~0,5	P
	Power factor obtained.....:	0,46	P
	Sequence.....:	See remarks	P
	T (min)	3 min	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm	P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	I _{Peak} (A) max. value:	717,3 A	P
	I ² t ≤ 710,2 A ² s		P
	Max. I ² t (A ² s)	E1-10 E1-11 E1-12	P
	L1	741,0	
	L2		466,1
	L3		710,2
	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.= 253 V. The circuit –breaker is in the open position		P

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Cl.	Requirement – Test	Result			Verdict	
	The leakage current shall not exceed 2 mA	E1-10	E1-11	E1-12	P	
	L1	0,1 mA	0,1 mA	0,1 mA		
	L2					
	L3					
	L4					
	Electric strength test:				P	
	Test voltage 1500 V (see 8.7.2)	1500 V			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)	0,96 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	1,6 A			P	
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	E1-10	E1-11	E1-12	P	
		87 s	127s	50 s		

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Cl.	Requirement – Test	Result	Verdict
	TESTS „E“ 3 samples	Type: D63 2P	P
9.12.11.4.2	Test: E1 (Test at service short-circuit capacity)		P
	Service short-circuit capacity.....:	7500 A	P
	Test circuit: figure.....:	Figure 4b	P
	Prospective current.....:	7500 A	P
	Prospective current obtained.....:	7600 A	P
	Test voltage 1,05 Un** or 1,1 Un ***	453,6 V	P
	Power factor.....:	0,45~0,5	P
	Power factor obtained.....:	0,47	P
	Sequence.....:	Table 19 in IEC/EN 60898	P
	T (min).....:	3 min	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm	P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	I _{Peak} (A) max. value:	E1-13 E1-14 E1-15	P
		4,58 kA 4,92 kA 4,91 kA	
	I ² t ≤101,6 kA ² s		P
	Max. I ² t (kA ² s)	E1-13 E1-14 E1-15	P
		L1 34,9 99,0 101,6	
		L2 34,1 98,3 101,3	
		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		P

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Cl.	Requirement – Test	Result			Verdict
	The leakage current shall not exceed 2 mA	E1-13	E1-14	E1-15	P
	L1	0,1 mA	0,1 mA	0,1 mA	
	L2	0,1 mA	0,1 mA	0,1 mA	
	L3				
	L4				
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)	1500 V			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				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
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	E1-13	E1-14	E1-15	P
		127 s	53 s	79 s	

IEC / EN 60898						
Cl.	Requirement – Test	Result	Verdict			
	TESTS „E“ 3 samples	Type: D1 2P	P			
9.12.11.4.2	Test: E1 (Test at service short-circuit capacity)		P			
	Service short-circuit capacity.....:	7500 A	P			
	Test circuit: figure.....:	Figure 4b	P			
	Prospective current.....:	7500 A	P			
	Prospective current obtained.....:	7600 A	P			
	Test voltage 1,05 Un** or 1,1 Un ***	453,6 V	P			
	Power factor.....:	0,45 ~ 0,5	P			
	Power factor obtained.....:	0,47	P			
	Sequence.....:	Table 19 in IEC/EN 60898	P			
	T (min).....:	3 min	P			
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm	P			
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A			
	I _{Peak} (A) max. value:	E1-16	E1-17	E1-18	P	
		786,8 A	1014 A	1001 A		
	I ² t ≤1204 A ² s				P	
	Max. I ² t (A ² s)	E1-16	E1-17	E1-18	P	
		L1	697,2	1130,0		1204,0
		L2	627,1	1092,0		1197,0
		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.= 440 V. The circuit –breaker is in the open position				P	

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	The leakage current shall not exceed 2 mA	E1-16	E1-17	E1-18	P
	L1	0,1 mA	0,1 mA	0,1 mA	
	L2	0,1 mA	0,1 mA	0,1 mA	
	L3				
	L4				
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)	1500 V			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)	0,96 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	1,6 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	E1-16	E1-17	E1-18	P
		37 s	55 s	89 s	

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „E“ 3 samples	Type: D63 4P	P
9.12.11.4.2	Test: E1 (Test at service short-circuit capacity)		P
	Service short-circuit capacity.....:	7500 A	P
	Test circuit: figure.....:	Figure 6	P
	Prospective current.....:	7500 A	P
	Prospective current obtained.....:	7644 A	P
	Test voltage 1,05 Un** or 1,1 Un ***	453,2 V	P
	Power factor.....:	0,45 ~ 0,5	P
	Power factor obtained.....:	0,46	P
	Sequence.....:	Table 20 in IEC/EN 60898	P
	T (min).....:	3 min	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm	P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	I _{Peak} (A) max. value:	E1-19 E1-20 E1-21	P
		5,02 kA 6,61 kA 5,65 kA	
	I ² t ≤ 185,9 kA ² s		P
	Max. I ² t (kA ² s)	E1-19 E1-20 E1-21	P
		L1 15,0 130,7 100,4	
		L2 52,0 162,5 108,8	
		L3 24,3 185,9 34,9	
		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. = 440 V. The circuit –breaker is in the open position		P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	The leakage current shall not exceed 2 mA	E1-19	E1-20	E1-21	P
	L1	0,1 mA	0,1 mA	0,1 mA	
	L2	0,1 mA	0,1 mA	0,1 mA	
	L3	0,1 mA	0,1 mA	0,1 mA	
	L4	0,1 mA	0,1 mA	0,1 mA	
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)	1500 V			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				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
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	E1-19	E1-20	E1-21	P
		149 s	198 s	51 s	

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „E“ 3 samples	Type: D1 4P	P
9.12.11.4.2	Test: E1 (Test at service short-circuit capacity)		P
	Service short-circuit capacity	7500 A	P
	Test circuit: figure	Figure 6	P
	Prospective current.....	7500 A	P
	Prospective current obtained	7644 A	P
	Test voltage 1,05 Un** or 1,1 Un ***	453,2 V	P
	Power factor.....	0,45~0,5	P
	Power factor obtained.....	0,46	P
	Sequence.....	Table 20 in IEC/EN 60898	P
	T (min).....	3 min	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm	P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	I _{Peak} (A) max. value:	E1-22 E1-23 E1-24	P
		574 A 533,1 A 533,4 A	
	I ² t ≤1087 A ² s		P
	Max. I ² t (A ² s)	E1-22 E1-23 E1-24	P
		L1 78,7 501,5 111,5	
		L2 372,6 429,0 1087,0	
		L3 398,1 654,4 471,7	
		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. = 440 V. The circuit –breaker is in the open position		P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	The leakage current shall not exceed 2 mA	E1-22	E1-23	E1-24	P
	L1	0,1 mA	0,1 mA	0,1 mA	
	L2	0,1 mA	0,1 mA	0,1 mA	
	L3	0,1 mA	0,1 mA	0,1 mA	
	L4	0,1 mA	0,1 mA	0,1 mA	
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)	1500 V			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)	0,96 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	1,6 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	E1-22	E1-23	E1-24	P
		149 s	48 s	109 s	
	TESTS „E2“ 3 samples	Type: D63 1P			
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)				
	rated short-circuit capacity.....:	10 000 A			
	Test circuit: figure.....:	Figure 3			
	Prospective current.....:	10 000 A			
	Prospective current obtained.....:	10 130 A			
	Test voltage 1,05 Un** or 1,1 Un ***	253,7 V			
	Power factor.....:	0,45 - 0,5			
	Power factor obtained.....:	0,49			
	Sequence.....:	Table 22 in IEC/EN 60898			
	T (min).....:	3 min			
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm			

IEC / EN 60898						
Cl.	Requirement – Test	Result			Verdict	
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm	dimension of enclosure: _____ x _____ x _____ mm				
	I_{Peak} (A) max. value.....:	E2-1	E2-2	E2-3		
		4,88 kA	5,49 kA	5,02 kA		
	$I^2t \leq 132,7 \text{ kA}^2\text{s}$					
	Max. I^2t (kA^2s)	E2-1	E2-2	E2-3	P	
	L1	132,7	60,7	52,9		
	L2					
	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:					
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.					
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times $U_n = 253 \text{ V}$. The circuit –breaker is in the open position	E2-1	E2-2	E2-3		
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P	
	L2					
	L3					
	L4(N)					
	Electric strength test:					
	Test voltage 900 V (see 9.7.3)					
	a)				P	
	b)				N/A	
	c)				P	
Deleted **	d)				P	
d) ***	e) 2000 V				N/A	
	Test current $2,8 I_N$	176,4 A				
	Tripping within $\geq 0,1 \text{ s}$ up to	E2-1	E2-2	E2-3		

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	- 60 s				N/A
	- 120 s	17 s	24 s	29 s	P

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	TESTS „E2“ 4 samples In the case of three-phase tests for single pole circuit-breakers	Type: D63 1P				
9.12.11.4 .3	Test: E2 (Test at rated short-circuit capacity)					
	rated short-circuit capacity	10 000 A				
	Test circuit: figure	Figure 5				
	Prospective current	10 000 A				
	Prospective current obtained.....	10 425 A				
	Test voltage 1,05 Un** or 1,1 Un ***	460,1 V				
	Power factor	0,45 - 0,5				
	Power factor obtained	0,49				
	Sequence	See remarks				
	T (min)	3 min				
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm				
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm	dimension of enclosure: _____x_____x_____mm				
	I _{Peak} (A) max. value	8,43 kA				
	I ² t ≤ 307 kA ² s					
	Max. I ² t(kA ² s)	E2-4	E2-5	E2-6	E2-7	P
	L1	307				
	L2		141,9			
	L3			232,1		
	L4				39,8	
	- 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:					
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.					

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 $U_n = 253$ V. The circuit –breaker is in the open position	E2-4	E2-5	E2-6	E2-7	
	The leakage current shall not exceed 2 mA L1	0,1mA	0,1mA	0,1mA	0,1mA	P
	L2					
	L3					
	L4(N)					
	Electric strength test:					
	Test voltage 900 V (see 9.7.3)					
	a)					P
	b)					N/A
	c)					P
Deleted **	d)					P
d) ***	e) 2000 V					N/A
	Test current $2,8 I_N$	176,4 A				
	Tripping within $\geq 0,1$ s up to	E2-4	E2-5	E2-6	E2-7	
	- 60 s					N/A
	- 120 s	18 s	21 s	24 s	31 s	P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „E2“ 3 samples	Type: D1 1P			
9.12.11.4	Test: E2 (Test at rated short-circuit capacity)				
.3	rated short-circuit capacity	10 000 A			
	Test circuit: figure	Figure 3			
	Prospective current	10 000 A			
	Prospective current obtained.....	10 130 A			
	Test voltage 1,05 Un** or 1,1 Un ***	253,5 V			
	Power factor	0,45-0,5			
	Power factor obtained	0,49			
	Sequence	Table 22 in IEC/EN 60898			
	T (min)	3 min			
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm			
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			
	I _{Peak} (A) max. value	E2-8	E2-9	E2-10	
		535,1 A	480,1 A	539,5 A	
	I ² t ≤ 715,4 A ² s				
	Max. I ² t(A ² s)	E2-8	E2-9	E2-10	P
	L1	715,4	305,4	438,7	
	L2				
	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:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.				

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 $U_n = 253$ V. The circuit –breaker is in the open position	E2-8	E2-9	E2-10	
	The leakage current shall not exceed 2 mA L1	0,1 mA	0,1 mA	0,1 mA	P
	L2				
	L3				
	L4(N)				
	Electric strength test:				
	Test voltage 900 V (see 9.7.3)				
	a)				P
	b)				N/A
	c)				P
Deleted **	d)				P
d) ***	e) 2000 V				N/A
	Test current $2,8 I_N$	2,8 A			
	Tripping within $\geq 0,1$ s up to	E2-8	E2-9	E2-10	
	- 60 s	37 s	27 s	35 s	P
	- 120 s				N/A

IEC / EN 60898						
Cl.	Requirement – Test	Result				Verdict
	TESTS „E2“ 4 samples In the case of three-phase tests for single pole circuit-breakers	Type: D1 1P				
9.12.11.4 .3	Test: E2 (Test at rated short-circuit capacity)					
	rated short-circuit capacity	10 000 A				
	Test circuit: figure	Figure 5				
	Prospective current	10 000 A				
	Prospective current obtained.....	10 425 A				
	Test voltage 1,05 Un** or 1,1 Un ***	460,1 V				
	Power factor	0,45-0,5				
	Power factor obtained	0,49				
	Sequence	See remarks				
	T (min)	3 min				
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm				
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm	dimension of enclosure: _____x_____x_____mm				
	I _{Peak} (A) max. value	4,31 kA				
	I ² t ≤ 40,3 kA ² s					
	Max. I ² t(kA ² s)	E2-11	E2-12	E2-13	E2-14	P
	L1	40,3				
	L2		40,1			
	L3			23,7		
	L4				24,9	
	- 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.					

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 $U_n = 253$ V. The circuit –breaker is in the open position	E2-11	E2-12	E2-13	E2-14	
	The leakage current shall not exceed 2 mA L1	0,1mA	0,1mA	0,1mA	0,1mA	P
	L2					
	L3					
	L4(N)					
	Electric strength test:					
	Test voltage 900 V (see 9.7.3)					
	a)					P
	b)					N/A
	c)					P
Deleted **	d)					P
d) ***	e) 2000 V					N/A
	Test current $2,8 I_N$	2,8 A				
	Tripping within $\geq 0,1$ s up to	E2-11	E2-12	E2-13	E2-14	
	- 60 s	25 s	41 s	28 s	32 s	P
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „E2“ 3 samples	Type: D63 2P			
9.12.11.4	Test: E2 (Test at rated short-circuit capacity)				
.3	rated short-circuit capacity	10 000 A			
	Test circuit: figure	Figure 4b			
	Prospective current	10 000 A			
	Prospective current obtained.....	10 230 A			
	Test voltage 1,05 Un** or 1,1 Un ***	453,6 V			
	Power factor	0,45-0,5			
	Power factor obtained	0,50			
	Sequence	Table 22 in IEC/EN 60898			
	T (min)	3 min			
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm			
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			
	I _{Peak} (A) max. value	6,95 kA			
	I ² t ≤ 164,7 kA ² s				
	Max. I ² t (kA ² s)	E2-15	E2-16	E2-17	P
	L1	164,7	119,1	50,3	
	L2	162,7	114,2	44,1	
	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:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 253 V. The circuit –breaker is in the open position	E2-15	E2-16	E2-17	

IEC / EN 60898						
Cl.	Requirement – Test	Result			Verdict	
	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	
		L3				
		L4(N)				
	Electric strength test:					
	Test voltage 900 V (see 9.7.3)					
	a)					P
	b)					P
	c)					P
Deleted **	d)					P
d) ***	e) 2000 V					N/A
	Test current $2,8 I_N$		176,4 A			
	Tripping within $\geq 0,1$ s up to		E2-15	E2-16	E2-17	
	- 60 s					N/A
	- 120 s		23 s	27 s	19 s	P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „E2“ 3 samples	Type: D1 2P			
9.12.11.4	Test: E2 (Test at rated short-circuit capacity)				
.3	rated short-circuit capacity	10 000 A			
	Test circuit: figure	Figure 4b			
	Prospective current	10 000 A			
	Prospective current obtained.....	10 230 A			
	Test voltage 1,05 Un** or 1,1 Un ***	453,6 V			
	Power factor	0,45-0,5			
	Power factor obtained	0,50			
	Sequence	Table 22 in IEC/EN 60898			
	T (min)	3 min			
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm			
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			
	I _{Peak} (A) max. value	775 A			
	I ² t ≤ 815 A ² s				
	Max. I ² t (A ² s)	E2-18	E2-19	E2-20	P
	L1	815,0	640,0	682,4	
	L2	732,0	618,6	787,7	
	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:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 253 V. The circuit –breaker is in the open position	E2-18	E2-19	E2-20	

IEC / EN 60898						
Cl.	Requirement – Test	Result			Verdict	
	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	
		L3				
		L4(N)				
	Electric strength test:					
	Test voltage 900 V (see 9.7.3)					
	a)					P
	b)					P
	c)					P
Deleted **	d)					P
d) ***	e) 2000 V					N/A
	Test current $2,8 I_N$	2,8 A				
	Tripping within $\geq 0,1$ s up to	E2-18	E2-19	E2-20		
	- 60 s	35 s	29 s	19 s		P
	- 120 s					N/A

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „E2“ 3 samples	Type: D63 4P			
9.12.11.4	Test: E2 (Test at rated short-circuit capacity)				
.3	rated short-circuit capacity	10 000 A			
	Test circuit: figure	Figure 6			
	Prospective current	10 000 A			
	Prospective current obtained.....	10 425 A			
	Test voltage 1,05 Un** or 1,1 Un ***	460,1 V			
	Power factor	0,45-0,5			
	Power factor obtained	0,49			
	Sequence	Table 22 in IEC/EN 60898			
	T (min)	3 min			
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm			
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			
	I _{Peak} (A) max. value	7,26 kA			
	I ² t ≤ 187,5 kA ² s				
	Max. I ² t (kA ² s)	E2-21	E2-22	E2-23	P
	L1	121,3	157,9	141,8	
	L2	165,0	177,9	187,5	
	L3	37,2	47,8	90,6	
	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:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 253 V. The circuit –breaker is in the open position	E2-21	E2-22	E2-23	

IEC / EN 60898						
Cl.	Requirement – Test	Result			Verdict	
	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	
		L3	0,1 mA	0,1 mA	0,1 mA	
		L4(N)	0,1 mA	0,1 mA	0,1 mA	
	Electric strength test:					
	Test voltage 900 V (see 9.7.3)					
	a)					P
	b)					P
	c)					P
Deleted **	d)					P
d) ***	e) 2000 V					N/A
	Test current $2,8 I_N$	176,4 A				
	Tripping within $\geq 0,1$ s up to	E2-21	E2-22	E2-23		
	- 60 s					N/A
	- 120 s	22 s	28 s	21 s		P

IEC / EN 60898					
Cl.	Requirement – Test	Result			Verdict
	TESTS „E2“ 3 samples	Type: D1 4P			
9.12.11.4	Test: E2 (Test at rated short-circuit capacity)				
.3	rated short-circuit capacity	10 000 A			
	Test circuit: figure	Figure 6			
	Prospective current	10 000 A			
	Prospective current obtained.....	10 425 A			
	Test voltage 1,05 Un** or 1,1 Un ***	460,1 V			
	Power factor	0,45-0,5			
	Power factor obtained	0,49			
	Sequence	Table 22 in IEC/EN 60898			
	T (min)	3 min			
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 45 mm			
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm	dimension of enclosure: _____x_____x_____mm			
	I _{Peak} (A) max. value	718 A			
	I ² t ≤ 688,2 A ² s				
	Max. I ² t(A ² s)	E2-24	E2-25	E2-26	P
	L1	0,2	2,0	1,9	
	L2	688,2	566,0	567,8	
	L3	326,0	489,7	12,1	
	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:				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall without maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= 253 V. The circuit –breaker is in the open position	E2-24	E2-25	E2-26	

IEC / EN 60898						
Cl.	Requirement – Test	Result			Verdict	
	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	
		L3	0,1 mA	0,1 mA	0,1 mA	
		L4(N)	0,1 mA	0,1 mA	0,1 mA	
	Electric strength test:					
	Test voltage 900 V (see 9.7.3)					
	a)					P
	b)					P
	c)					P
Deleted **	d)					P
d) ***	e) 2000 V					N/A
	Test current $2,8 I_N$	2,8 A				
	Tripping within $\geq 0,1$ s up to	E2-24	E2-25	E2-26		
	- 60 s	21 s	26 s	35 s		P
	- 120 s					N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	TESTS „E3“ 3 samples		N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	Annex E (normative)		N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	Annex J (normative)		N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	Annex K (normative)		N/A

IEC / EN 60898			
Cl.	Requirement – Test	Result	Verdict
	Annex L (normative)		N/A

EN 60 898			
Cl.	Requirement – Test	Result	Verdict
	Annex ZC (normative)		P
	Special national conditions (only for EN 60898-1)		P
J.1	Austria, Czech Republic, Denmark, Germany, Netherlands, Norway and Switzerland		N/A
	The upper limit of current for use of screw less terminals is 16 A		N/A
J.3.3	Austria, Belgium, Denmark, France, Germany, Italy, Portugal, Spain, Sweden, Switzerland, and United Kingdom		N/A
	Only universal screw less type terminals are accepted		N/A
K1	Belgium, France, Italy, Portugal, Spain, and United Kingdom		N/A
	The use of circuit-breakers with flat quick-connect terminations for rated currents up to and including 20 A is accepted.		N/A
K.8.2.2	Belgium, France, Italy, Portugal, Spain, and United Kingdom		N/A
	The use for rated currents up to and including 20 A		N/A

Photos:



Overview, 3P +N



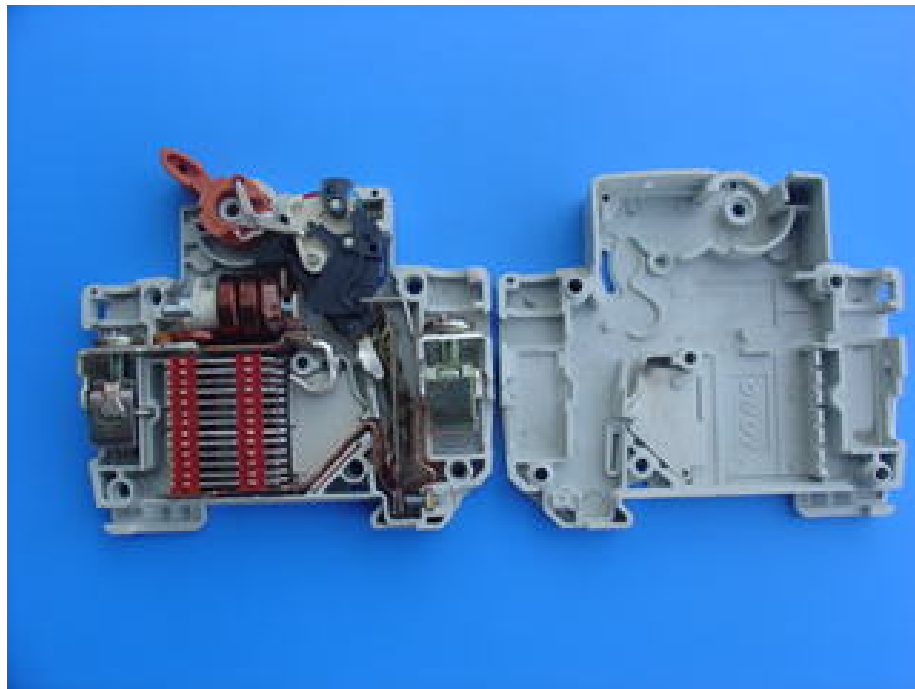
Overview, 3 poles



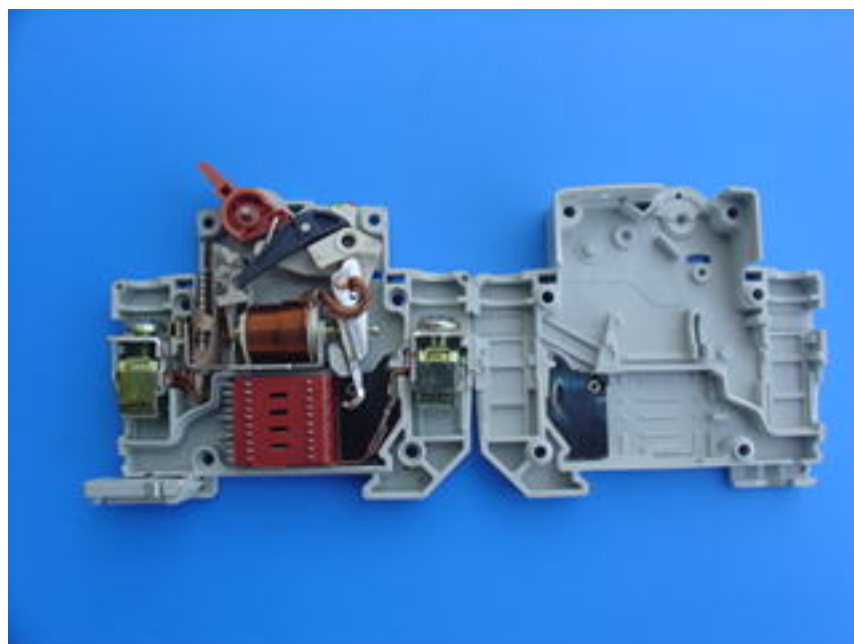
Overview, 1P+N



Side view



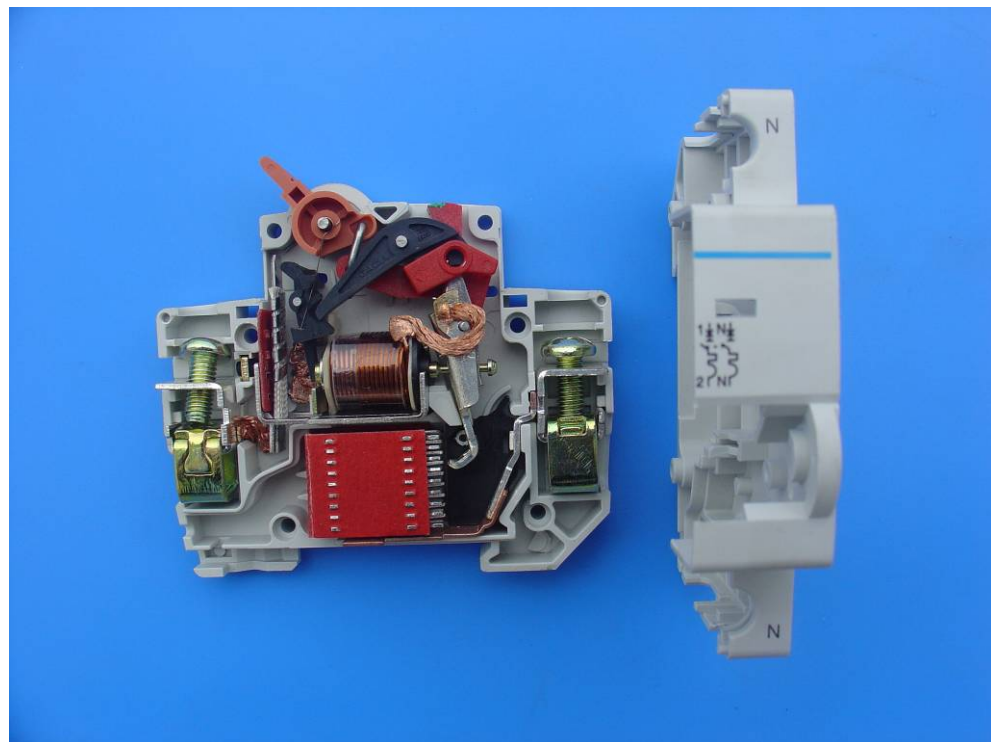
Internal view of rated current D63



Internal view of rated current D1



Side view



Internal view of N pole