





Test Report issued under the responsibility of:



TEST REPORT IEC 60947-2 Low-voltage switchgear and controlgear - Part 2: Circuit-breakers	
Report Number..... :	190801555SHA-001
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Total number of pages .....	148
Name of Testing Laboratory preparing the Report .....	Intertek Testing Services Shanghai Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
Applicant's name .....	Wenzhou Aoelec Electrical Co., Ltd.
Address..... :	No. 7, Zhenxing Road, Xinguang Industry Zone, Liushi, Yueqing, Zhejiang, China
Test specification:	
Standard..... :	IEC 60947-2:2016 (EN 60947-2:2017)
Test procedure .....	CB Scheme
Non-standard test method .....	N/A
Test Report Form No. .... :	IEC60947_2H
Test Report Form(s) Originator .... :	DEKRA Certification B.V.
Master TRF .....	Dated 2017-04
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Test item description..... :	Moulded Case Circuit-Breakers
Trade Mark..... :	<b>Aoelec</b>
Manufacturer .....	Same as applicant
Model/Type reference .....	AUB2
Ratings .....	Un=240V~ (1P), 415V~(2P, 3P, 4P); Cat.A In=63, 80, 100, 125A;

<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	Intertek Testing Services Shanghai
<b>Testing location/ address .....</b>		Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
<input checked="" type="checkbox"/>	<b>Associated CB Testing Laboratory:</b>	Inspection Center of Products' Quality of Low Voltage Electric Apparatus in Zhejiang Province
<b>Testing location/ address .....</b>		No. 400 Guangqiong Rd., Jiaxing, Zhejiang, CHINA
<b>Tested by (name, function, signature)..... :</b>		Allen Wang (Engineer) 
<b>Approved by (name, function, signature) .. :</b>		Quiet Lin (Mandated review) 
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name, function, signature):</b>		
<b>Approved by (name, function, signature) .. :</b>		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature)..... :</b>		
<b>Witnessed by (name, function, signature) . :</b>		
<b>Approved by (name, function, signature) .. :</b>		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name, function, signature):</b>		
<b>Witnessed by (name, function, signature) . :</b>		
<b>Approved by (name, function, signature) .. :</b>		
<b>Supervised by (name, function, signature) :</b>		

**Summary of testing:**

Number of tests for test procedure, according to table 9a and table 10

Report No.	In (A)	Poles	Test sequence and number of samples								
			I	II	III	IV	V	Annex B	Annex C	Annex H	Annex M
190801555 SHA-001	125	4P	1	1	1+1 <sup>a)</sup>	-	-	-	-	1	-
	63	4P	-	1	1+1 <sup>a)</sup>	-	-	-	-	-	-
	125	3P	1 <sup>b)</sup>	-	1	-	-	-	-	-	-
	125	2P	1	1	1	-	-	-	-	1	-
	63	2P	-	1	1	-	-	-	-	-	-
	125	1P	1	1	1	-	-	-	-	-	-
	63	1P	-	1	1	-	-	-	-	-	-

Note:

a): Tested on the 4<sup>th</sup> pole and its adjacent pole.

b): Only tests in Clause 8.3.3.2 to Clause 8.3.3.6 of Sequence I were performed.

In case of alternative test programs for circuit breakers with a different number of poles, the following program is used:

☐ Programme 1 (three pole fully tested)

☒ Programme 2 (four pole fully tested)

☐ Alternative program not applicable

<b>Tests performed (name of test and test clause):</b>		<b>Testing location:</b>
8.3.3.1	Tripping limits and characteristics	ACTL
8.3.3.2	Dielectric properties	ACTL
8.3.3.3	Operational performance capability	ACTL
8.3.3.4	Overload performance	ACTL
8.3.3.5	Verification of dielectric withstand	ACTL
8.3.3.6	Verification of temperature rise	ACTL
8.3.3.7	Verification of overload releases	ACTL
8.3.3.8	Verification of undervoltage and shunt releases (if applicable)	CBTL
8.3.3.9	Verification of main contact position (for circuit breakers suitable for isolation)	CBTL
8.3.4.1	Service short-circuit breaking capacity	ACTL
8.3.4.2	Verification of operational capability	ACTL
8.3.4.3	Verification of dielectric withstand	ACTL
8.3.4.4	Verification of temperature rise	ACTL
8.3.4.5	Verification of overload releases	ACTL
8.3.5.1	Verification of overload releases	ACTL
8.3.5.2	Ultimate short-circuit breaking capacity	ACTL
8.3.5.3	Verification of dielectric withstand	ACTL
8.3.5.4	Verification of overload releases	ACTL
	Annex H	ACTL
<p><b>Summary of compliance with Group Differences (List of countries addressed):</b></p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of EN 60947-2: 2017.</p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of IEC 60947-2: 2016.</p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of AS/NZS 60947.2: 2015</p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of VC8036</p> <p>EN 60947-2: 2017 is equivalent to IEC 60947-2: 2016.</p> <p>AS/NZS 60947.2:2015 is identical to IEC 60947-2: 2013, which is covered by IEC 60947-2:2016</p> <p>The test results obtained and the general performance is considered to comply with the national differences VC8036:2015, see Annex n° 1 at page 132.</p>		

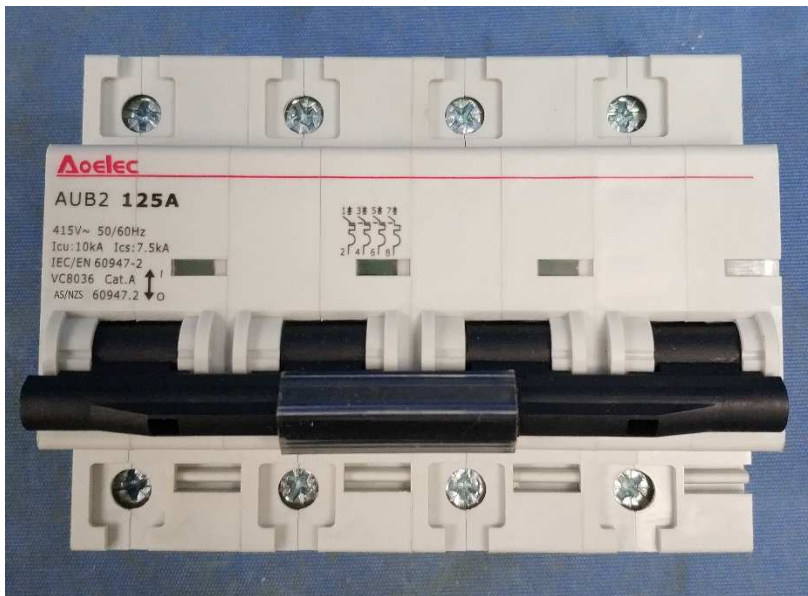
## Copy of marking plate:

1P



2P



**Copy of marking plate:****3P****4P**

Test item particulars: test item vs. test requirements	
3. Classification	
3.1. Utilization category: (A or B). .....	A
3.2. Interruption medium: (air, vacuum, gas break).....	air
3.3. Design: (open construction, moulded case) .....	Moulded case
3.4. Method of controlling the operation mechanism: (dependent manual, independent manual, dependent power, independent power, stored energy operation ).....	Independent manual
3.5. Suitability for isolation: (suitable, not suitable).....	Suitable
3.6. Provision for maintenance: (maintainable, non- maintainable) .....	Non-maintainable
3.7. Method of installation: (fixed, plug-in, withdrawable.....	Fixed
3.8. Degree of protection of enclosure: (IP code).....	IP20 (Normal installed)
4.7. Type of release (thermo-magnetic / electronic).....	Thermo-magnetic
4.8. Integral fuses (integrally fused circuit-breakers) Type and characteristics of SCPD .....	N/A
7.3 Electromagnetic compatibility (EMC) Environment A or B.....	N/A
Circuit-breaker for use on phase-earthed systems .....	N/A
Circuit-breaker for use in IT systems .....	Yes
Rated and limiting values, main circuit .....	
- rated operational voltage: $U_e$ (V) .....	240V~(1P); 415V~(2P, 3P, 4P);
- rated insulation voltage: $U_i$ (V) .....	690V
- rated impulse withstand voltage: $U_{imp}$ (kV) .....	4
- rated current: $I_n$ (A) .....	63, 80, 100, 125A
- kind of current .....	AC
- conventional free air thermal current: $I_{th}$ (A) .....	63, 80, 100, 125A
- conventional enclosed thermal current: $I_{the}$ (A).....	N/A
- current rating for four-pole circuit-breakers: (A) .....	63, 80, 100, 125A
- number of poles.....	1P, 2P, 3P, 4P
- rated frequency: (Hz).....	50/60Hz
- integral fuses (rated values).....	N/A
Rated duty :	
- eight-hour duty.....	N/A
- uninterrupted duty: $I_u$ (A) .....	63, 80, 100, 125A
Short-circuit characteristic :	
rated short-time making capacity: $I_{cm}$ (kA) .....	N/A
rated ultimate short-circuit breaking capacity: $I_{cu}$ (kA) ..	10
rated service short-circuit breaking capacity: $I_{cs}$ (kA) .....	7,5

rated short-time withstand current: $I_{cw}$ (kA/s) .....	N/A
Selectivity category (A or B) .....	A
Control circuits :	
Electrical control circuits :	
- kind of current: (AC, DC) .....	N/A
- rated frequency: (Hz) .....	N/A
- rated control circuit voltage: $U_c$ ( nature, frequency, V) .....	N/A
- rated control supply voltage: $U_s$ (nature, frequency V) .....	N/A
Air supply control circuits: (pneumatic or electro-pneumatic) :	
- rated pressure and its limit .....	N/A
- volumes of air, at atmospheric pressure, required for each closing and each opening operation .....	N/A
Auxiliary circuits :	
Rated and limiting values, auxiliary circuits .....	
- rated operational voltage $U_e$ (V) .....	N/A
- rated insulation voltage: $U_i$ (V) .....	N/A
- rated operational current: $I_e$ (A) .....	N/A
- kind of current .....	N/A
- rated frequency: (Hz) .....	N/A
- number of circuits .....	N/A
- number and kind of contact elements .....	N/A
- rated uninterrupted current: $I_u$ (A) .....	N/A
- utilization category: (AC, DC, current and voltage) .....	N/A
Short-circuit characteristic :	
- Rated conditional short-circuit current (kA) .....	N/A
- kind of protective device .....	N/A
Releases :	
1) shunt release .....	N/A
2) Over-current release .....	
a) instantaneous .....	Yes
b) definite time delay .....	N/A
c) inverse time delay .....	
- independent of previous load .....	N/A
- dependent on previous load; (for example thermal type release) .....	Yes
3) Undervoltage release (for opening) .....	N/A
4) Other releases .....	N/A
Characteristics :	



1) Shunt release and undervoltage release (for opening)....:	
- rated control circuit voltage: $U_c$ ( nature, frequency, V) .....	N/A
- kind of current .....	N/A
- rated frequency: (if AC) .....	N/A
2) Over-current release .....	
- rated current .....	63, 80, 100, 125A
- kind of current .....	AC
- rated frequency: (if AC) .....	50/60Hz
- current setting (or range of settings).....	Inverse time delay: $I_n$ Instantaneous: $I_i = 10I_n$
- time settings (or range of settings).....	Inverse time delay: $1,05I_n: \geq 1h, 1,30I_n < 1h$ (for $I_n \leq 63A$ ) Inverse time delay: $1,05I_n: \geq 2h, 1,30I_n < 2h$ (for $I_n > 63A$ ) Instantaneous: $0,8I_i: \geq 0,2s, 1,2I_i: < 0,2s$
Classification of installation and use .....	Rail Installed
Supply Connection.....	N/A
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object .....	N/A
- test object does meet the requirement .....	P (Pass)
- test object does not meet the requirement .....	F (Fail)
<b>Testing</b> .....	
Date of receipt of test item.....	2019-07-24
Date (s) of performance of tests.....	Form 2019-07-24 to 2019-10-10

**General remarks:**

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

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

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**Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.**

**Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60335-1:**

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....

☐ **Yes**  
☒ **Not applicable**

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

**Name and address of factory (ies) .....** : Same as applicant

**General product information:**

$U_n = 240V \sim (1P), 415V \sim (2, 3, 4P), 50/60Hz$

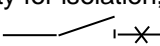


$I_n = 63, 80, 100, 125A$

$I_{cu} = 10kA, I_{cs} = 7,5kA, U_i = 690V \sim, U_{imp} = 4kV$


Utilization category: A

The fourth pole is identical with phase pole

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict


<b>5.2</b>	<b>MARKING</b>		
a)	The following data shall be marked on the circuit-breaker itself or on a name plate or nameplates attached to the circuit-breaker, and located in a place such that they are visible and legible when the circuit-breaker is installed.		
	- rated current:	63, 80, 100, 125A	P
	- suitability for isolation, if applicable, with the symbol 		P
	- indication of the open and closed position: with $\bigcirc$ and $\text{I}$ respectively, if symbols are used	"O"-OFF, "I"-ON.	P
b)	Marking on equipment not needed to be visible after mounting:		
	- manufacturer's name or trademark		P
	- type designation or serial number	AUB2	P
	- IEC 60947-2 if the manufacturer claims compliance with this standard.	IEC/EN60947-2	P
	- selectivity category	Cat. A	P
	- rated operational voltage(s) $U_e$	240V~(1P); 415V~(2P, 3P, 4P)	P
	- Circuit-breaker for use in IT systems: Circuit-breaker for which all values of rated voltage have not been tested according to annex H or are not covered by such testing, shall be identified by the symbol  which shall be marked on the circuit-breaker immediately following these values of rated voltage		N/A
	-rated impulse withstand voltage ( $U_{imp}$ );	4kV	N/A
	- value (or range) of the rated frequency and/or the indication DC (or symbol)	50/60Hz	P
	- rated service short-circuit breaking capacity. $I_{cs}$	7,5kA	P
	- rated ultimate short-circuit breaking capacity. $I_{cu}$	10kA	P
	- rated short-time withstand current, ( $I_{cw}$ ) and associated short-time delay, for utilization category B		N/A
	- line and load terminals, unless their connection is immaterial	"1", "2" (1P); "1, 3", "2, 4" (2P); "1, 3, 5", "2, 4, 6" (3P); "1, 3, 5, 7", "2, 4, 6, 8" (4P);	P
	- neutral pole terminals, if applicable, by the letter N		N/A
	- protective earth terminal, where applicable, by the symbol acc. 7.1.9.3 of part 1		N/A
	- ref. temperature for non-compensated thermal releases, if different from 30°C		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- range of the current setting ( $I_r$ ) of adjustable overload release		N/A
	- value / range of the rated instantaneous short-circuit current setting ( $I_i$ ), fixed or adjustable	$I_i=10I_n$	P
c)	Marked on the circuit-breaker as specified in item b), or shall be made available in the manufacturer's published information:		
	- rated short-circuit making capacity ( $I_{cm}$ ) (if higher than specified in 4.3.5.1)		N/A
	- rated insulation voltage. ( $U_i$ ) if higher than the maximum rated operational voltage)	690V~	P
	- rated impulse withstand voltage ( $U_{imp}$ ), when declared.	4kV	P
	- pollution degree if other than 3		N/A
	- conventional enclosed thermal current ( $I_{the}$ ) if different from the rated current:		N/A
	- IP Code, where applicable:	IP20 (normally installed)	P
	- minimum enclosure size and ventilation data (if any) to which marked ratings apply:		N/A
	- details of minimum distance between circuit-breaker and earthed metal parts for circuit-breaker intended for use without enclosure:		P
	- suitability for environment A or B		N/A
	- r.m.s sensing if applicable, according to F.4.1.1		N/A
	- minimum cable cross-section, if different from Table 9 of IEC 60947-1, for ratings $\leq 20$ A according to rated ultimate short-circuit breaking capacity $I_{cu}$ :		N/A
	- values of tightening torque for the circuit-breaker terminals.	2,5Nm	P
d)	The following data concerning the opening and closing devices of the circuit-breaker shall be placed either on their own nameplates or on the nameplate of the circuit-breaker:		
	- rated control circuit voltage of the closing device, and rated frequency for AC:		N/A
	- rated control circuit voltage of the shunt release and/or of the under-voltage release, and rated frequency:		N/A
	- rated current of indirect over-current releases:		N/A
	- number and type of auxiliary contacts and kind of current, rated frequency (if AC) and rated voltages of the auxiliary switches, if different from those of the main circuit.		N/A
e)	Terminal shall be clearly and permanently identified in acc. with IEC 60445 and annex L :		
	- line terminal	1, 3, 5, 7	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- load terminal	2, 4, 6, 8	P
	- neutral pole terminal "N"		N/A
	- protective earth terminal 		N/A
	- terminal of coils (A/B)		N/A
	- terminal of shunt release ( B )		N/A
	- terminals of under-voltage release (D)		N/A
	- terminals of interlocking electromagnets (E)		N/A
	- terminals of indicated light devices (X)		N/A
	- terminals of contact elements for switching devices (no)		N/A
<b>7.1</b>	<b>CONSTRUCTION</b>		
7.1.5 part 1	Actuator		
7.1.5.1	Insulation		
	The actuator of the equipment shall be insulated from the live parts for the rated insulation voltage and, if applicable, the rated impulse withstand voltage		P
	If it is made of metal, it shall be capable of being satisfactorily connected to a protective conductor unless it is provided with additional reliable insulation		N/A
	If it is made of or covered by insulating material, any internal metal part, which might become accessible in the event of insulation failure, shall also be insulated from live parts for the rated insulation voltage		N/A
7.1.5.2	Direction of movement		
	The direction of operation for actuators of devices shall normally conform to IEC 60447.		P
	Where devices cannot conform to these requirements, e.g. due to special applications or alternative mounting positions, they shall be clearly marked such that there is no doubt as to the "I" and "O" positions and the direction of operation		N/A
7.1.6 part 1	Indication of contact position		
7.1.6.1	Indicating means		
	When an equipment is provided with means for indicating the closed and open positions, these positions shall be unambiguous and clearly indicated		P
	This is done by means of a position indicating device (see 2.3.18)		P
	If symbols are used, they shall indicate the closed and open position respectively, in accordance with IEC 60417-2:		
	- 60417-2-IEC-5007      I    On (power)	I	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- 60417-2-IEC-5007 <b>O</b> Off (power)	<b>O</b>	P
	For equipment operated by means of two push-buttons, only the push-button designated for the opening operation shall be red or marked with the symbol "O"		N/A
	Red colour shall not be used for any other push-button		N/A
	The colours of other push-buttons, illuminated push-buttons and indicator lights shall be in accordance with IEC 60073		N/A
7.1.6.2	Indication by the actuator		
	When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided		P
7.1.8 part 1	Terminals		
7.1.8.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength		P
	Terminal connections shall be such that necessary contact pressure is maintained		P
	Terminals shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal		P
	Terminal shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage shall not be reduced below the rated value		P
7.1.8.2	Connection capacity		
	type of conductors :	Rigid-solid, stranded or flexible copper conductor	P
	minimum cross-sectional area of conductor (mm <sup>2</sup> ) :	16 mm <sup>2</sup>	N/A
	maximum cross-sectional area of conductor (mm <sup>2</sup> ) :	50 mm <sup>2</sup>	P
	number of conductors simultaneously connectable to the terminal :	1 for 16 mm <sup>2</sup> 1 for 50 mm <sup>2</sup>	P
7.1.8.3	Connection		
	terminals for connection to external conductors shall be readily accessible during installation		P
	clamping screws and nuts shall not serve to fix any other component		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.8.4	Terminal identification and marking		
	terminal intended exclusively for the neutral conductor		N/A
	protective earth terminal		N/A
	other terminals	"1, 3, 5, 7", "2, 4, 6, 8"	P
7.1.10 part 1	Provisions for protective earthing		
7.1.10.1	The exposed conductive parts (e.g. chassis, framework and fixed parts of metal enclosures) other than those which cannot constitute a danger shall be electrically interconnected and connected to a protective earth terminal for connection to an earth electrode or to an external protective conductor		N/A
	This requirement can be met by the normal structural parts providing adequate electrical continuity and applies whether the equipment is used on its own or incorporated in an assembly		N/A
	Exposed conductive parts are considered not to constitute a danger if they cannot be touched on large areas or grasped with the hand or if they are of small size (approximately 50 mm x 50 mm) or are so located as to exclude any contact with live parts		N/A
7.1.10.2	Protective earth terminal		
	The protective earth terminal shall be readily accessible and so placed that the connection of the equipment to the earth electrode or to the protective conductor is maintained when the cover or any other removable part is removed		N/A
	The protective earth terminal shall be suitably protected against corrosion		N/A
	In the case of equipment with conductive structures, enclosures, etc., means shall be provided, if necessary, to ensure electrical continuity between the exposed conductive parts the equipment and the metal sheathing of connecting conductors		N/A
	The protective earth terminal shall have no other function, except when it is intended to be connected to a PEN conductor (see 2.1.1.5 – Note). In this case, it shall also have the function of a neutral terminal in addition to meeting the requirements applicable to the protective earth terminal		N/A
7.1.10.3	Protective earth terminal marking and identification		
	The protective earth terminal shall be clearly and permanently identified by its marking		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The identification shall be achieved by colour (green-yellow mark) or by the notation PE, or PEN, as applicable, in accordance with IEC 60445, subclause 5.3, or, in the case of PEN, by a graphical symbol for use on equipment		N/A
	Graphical symbol to be used: 60417-2-IEC-5019  Protective earth (ground) in accordance with IEC 60417-2		N/A
7.1.11 part 1	Enclosure for equipment		
7.1.11.1	Design		
	The enclosure, when it is opened: all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space shall be provided inside the enclosure		N/A
	The fixed parts of a metal enclosure shall be electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		N/A
	Under no circumstances shall a removable metal part of the enclosure be insulated from the part carrying the earth terminal when the removable part is in place		N/A
	The removable parts of the enclosure shall be firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		N/A
	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means shall be provided to prevent loss of the fastening devices		N/A
	If the enclosure is used for mounting push-buttons, it shall not be possible to remove the buttons from the outside of the enclosure		N/A
7.1.11.2	Insulation		
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining shall be securely fixed to the enclosure		N/A
7.1.12 part 1	Degree of protection of enclosed equipment		
	Degree of protection.	IP20 (after normal installation)	



IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test for first characteristic.		
	Test for first numeral (1, 2, 3, 4, 5, 6) .....:	2	P
	Test for second characteristic		
	Test for second numeral (1, 2, 3, 4, 5, 6, 7, 8) .....:	0	P
7.1.13 part 1	Conduit pull-out, torque and bending with metallic conduits		
	Polymeric enclosures of equipment, whether integral or not, provided with threaded conduit entries, intended for the connection of extra heavy duty, rigid threaded metal conduits complying with IEC 60981, shall withstand the stresses occurring during its installation such as pull-out, torque, bending		N/A
7.1.2	Withdrawable circuit-breaker		N/A
	In the disconnected position (main- and auxiliary circuits)		
	Isolating distances for circuit-breaker suitable for isolating comply with the requirements specified for the isolating function		N/A
	Mechanism fitted with a reliable indicating device with indicates the position of the isolating contacts.		N/A
	Mechanism fitted with interlocks which only permit the isolating contacts to be separate or re-closed when main contacts are open		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when the isolating contacts are fully closed.		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when in disconnected position.		N/A
	In disconnected position, the isolating distances between the isolating contacts cannot be inadvertently reduced.		N/A
7.1.3	Additional requirements for circuit-breakers suitable for isolation		P
7.1.7 part 1	Additional safety requirements for equipment suitable for isolation		
7.1.7.1	Additional constructional requirements for equipment suitable for isolation ( $U_e > 50 \text{ V}$ ):		
	Equipment suitable for isolation shall provide in the open position an isolation distance in acc. with the requirements necessary to satisfy the isolating function. Indication of the main contacts shall be provide by one or more of the following means:		
	- the position of the actuator		P
	- a separate mechanical indicator		P
	- visibility of the moving contacts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	When means are provided or to lock the equipment in the open position, locking only be possible when contacts are in the open position		N/A
	Actuator front-plate fitted to the equipment in a manner which ensures correct contact position indication and locking		P
	The indicated open position is the only position in which the specified isolation distances between the contacts is ensured.		P
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm) :	3,0	
	- measured clearances (mm) :	4,1	P
	- test Uimp across gap (kV) :	6,2	P
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		
	auxiliary switch shall be rated according to IEC 60 947-5-1		N/A
	If equipment suitable for isolation is provided with an auxiliary switch for the purpose of electrical interlocking with contactor (s) or circuit-breaker(s) and intended to be used in motor circuits, the following requirements shall apply unless the equipment is rated for AC-23 utilization category		N/A
	The time interval between the opening of the contacts of the auxiliary switch and the contacts of the main poles shall be sufficient to ensure that the associated contactor or circuit-breaker interrupts the current before the main poles of the equipment open		N/A
	Unless otherwise stated in the manufacturer's technical literature, the time interval shall be not less than 20 ms when the equipment is operated according to the manufacturer instructions		N/A
	Compliance shall be verified by measuring the time interval between the instant of opening of the auxiliary switch and the instant of opening of the main poles under no-load conditions when the equipment is operated according to the manufacturer's instructions		N/A
	During the closing operation the contacts of the auxiliary switch shall close after or simultaneously with the contacts of the main poles		N/A
	A suitable opening time interval may also be provided by an intermediate position (between the ON and OFF position) at which the interlocking contact(s) is (are) open and the main poles remain closed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position:		
	the locking means shall be designed in such a way that it cannot be removed with the appropriate padlock(s) installed		N/A
	Alternatively, the design may provide padlockable means to prevent access to the actuator		N/A
	test force F applied to the actuator in an attempt to operate to the closed position (N) :		N/A
	rated impulse withstand voltage (kV) :		N/A
	test Uimp on open main contacts at the test force		N/A
	If the tripped position is not the indicated open position, it should be clearly identified.		
7.1.4	Clearances and creepage distances:		
	For circuit-breakers for which the manufacturer has declared a value of rated impulse withstand voltage. (Uimp.)		
	Clearances distances:		
	- Uimp is given as:	4kV	
	- max. value of rated operational voltage to earth	240V	
	- nominal voltage of supply system:	415V	
	- overvoltage category:	III	
	- pollution degree:	3	
	- field-in or homogeneous:	Field-inhomogeneous	
	- minimum clearances (mm):	3,0	
	- measured clearances (mm):	4,1	P
	Creepage distances:		
	- rated insulation voltage Ui (V)	690	
	- pollution degree	3	
	- comparative tracking index (V)	175	
	- material group	IIIa	
	- minimum creepage distances (mm)	10	
	- measured creepage distances (mm)	12,2	P
7.1.5	Requirements for the safety of the operator		
	There shall be no path or opening which allows incandescent particles to be discharged from the area of the manual operating means:		P

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Clause	Requirement + Test	Result - Remark	Verdict
7.1.7	Additional requirements for equipment provided with a neutral pole		
7.1.9 part 1	When equipment is provided with a pole intended only for connecting the neutral, this pole shall be clearly identified to that effect by the letter N (see 7.1.7.4.).		N/A
	A switched neutral pole shall break not before and shall make not after the other poles		N/A
	For equipment having a value of conventional thermal current (free air or enclosed, see 4.3.2.1 and 4.3.2.2) not exceeding 63 A, this value shall be identical for all poles		N/A
	For higher conventional thermal current values, the neutral pole may have a value of conventional thermal current different from that of the other poles, but not less than half that value or 63 A, whichever is the higher		N/A
	If a pole with an appropriate making and breaking capacity is used as a neutral pole, then all poles, incl. the neutral pole, may operate substantially together.		N/A
7.1.8	Digital inputs and outputs for use with programmable logic controllers (PLCs)		
	Compliant with Annex S of IEC 60947-1:2007		N/A
	Annex S does not apply to digital inputs and outputs dedicated to devices other than PLCs		N/A
7.2	Performance requirements		
7.2.1	Operating condition		
7.2.1.1	Closing		
	For a circuit-breaker to be closed safely on to the making current corresponding to its rated short-circuit making capacity, it is essential that it should be operated with the same speed and the same firmness as during the type test for proving the short-circuit making capacity		P
7.2.1.1.2	Dependent manual closing		
	For a circuit-breaker having a dependent manual closing mechanism, it is not possible to assign a short-circuit making capacity rating irrespective of the conditions of mechanical operation		N/A
	Such a circuit-breaker should not be used in circuits having a prospective peak making current exceeding 10 kA		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	However, this does not apply in the case of a circuit-breaker having a dependent manual closing mechanism and incorporating an integral fast-acting opening release which causes the circuit-breaker to break safely, irrespective of the speed and firmness with which it is closed on to prospective peak currents exceeding 10 kA; in this case, a rated short-circuit making capacity can be assigned		N/A
7.2.1.1.3	Independent manual closing		
	A circuit-breaker having an independent manual closing mechanism can be assigned a short-circuit making capacity rating irrespective of the conditions of mechanical operation		P
7.2.1.1.4	Dependent power closing		
	At 110% of the rated control supply voltage, the closing operation performed on no-load shall not cause any damage to the circuit-breaker.		N/A
	At 85% of the rated control supply voltage, the closing operation shall be performed when the current established by the circuit-breaker is equal to its rated making capacity within the limits allowed by the operation of its relays or releases and, if a maximum time is stated for the closing operation, in a time not exceeding this maximum time limit.		N/A
7.2.1.1.5	Independent power closing		
	A circuit-breaker having an independent power closing operation can be assigned a rated short-circuit making capacity irrespective of the conditions of power closing		N/A
	Means for charging the operating mechanism, as well as the closing control components, shall be capable of operating in accordance with the manufacturer's specification		N/A
7.2.1.1.6	Stored energy closing		
	Capable ensuring closing of the circuit-breaker in any condition between no-load and its rated making capacity		N/A
	- when the stored energy is retained within the circuit-breaker, a device is provided which indicates when the storing mechanism is fully charged.		N/A
	- means for charging the operating mechanism and closing control components operates when auxiliary supply voltage is between 85% and 110% of the rated control supply voltage.		N/A
	- not possible for the moving contacts to move from the open position, unless the charge is sufficient for satisfactory completion of the closing operation.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- by manually operated circuit-breaker is the direction of operation indicated. (not for circuit-breaker with an independent manual closing operation.)		N/A
	- For trip free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the release is in the position to trip the circuit-breaker.		N/A
7.2.1.2	Opening		
7.2.1.2.1	Circuit-breakers which open automatically shall be trip-free and, unless otherwise agreed between manufacturer and user, shall have their energy for the tripping operation stored prior to the completion of the closing operation		
7.2.1.2.2	Opening by undervoltage releases		
7.2.1.3. part 1	Limits of operation of under-voltage relays and releases		
7.2.1.3. a	Operating voltage		
	An under-voltage relay or release, when associated with a switching device, shall operate to open the equipment even on a slowly falling voltage within the range between 70% and 35% of its rated voltage		N/A
	An under-voltage relay or release shall prevent the closing of the equipment when the supply voltage is below 35% of the rated voltage of the relay or release; it shall permit closing of the equipment at supply voltages equal to or above 85% of its rated value		N/A
	Unless otherwise stated in the relevant product standard, the upper limit of the supply voltage shall be 110% of its rated value		N/A
7.2.1.3. b	Operating time		
	For a time-delay under-voltage relay or release, the time-lag shall be measured from the instant when the voltage reaches the operating value until the instant when the relay or release actuates the tripping device of the equipment		N/A
7.2.1.2.3	Opening by shunt releases		N/A
7.2.1.4 part 1	Limits of operation of shunt releases		
	A shunt release for opening shall cause tripping under all operating conditions of an equipment when the supply voltage of the shunt release measured during the tripping operation remains between 70% and 110% of the rated control supply voltage and, if a.c., at the rated frequency		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.2.4	Opening by over-current releases		
a)	Opening under short-circuit conditions		
	The short-circuit release shall cause tripping of the circuit-breaker with an accuracy of 20% of the tripping current value of the current setting for all values of the current setting of the short-circuit current release		P
	Where necessary for over-current co-ordination the manufacturer shall provide information (usually curves) showing		N/A
	- maximum cut-off (let-through) peak current as a function of prospective current (r.m.s. symmetrical)		N/A
	- $Pt$ characteristics for circuit-breakers of utilization category A and, if applicable, B for circuit-breakers with instantaneous override (see note to 8.3.5)		N/A
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of $\pm 10\%$ of the tripping current value of the current setting for all values of current setting of the overload release		N/A
2)	Inverse time-delay operation		
	At the reference temperature and at 1,05 times the current setting with the conventional non-tripping current, the opening release being energized on all poles, tripping shall not occur in less than the conventional time from the cold state, i.e. with the circuit-breaker at the reference temperature		P
	Moreover, when at the end of the conventional time the value of current is immediately raised to 1,30 times the current setting, i.e. with the conventional tripping current, tripping shall then occur in less than the conventional time later		P
	If a release is declared by the manufacturer as substantially independent of ambient temperature, the current values of table 6 shall apply within the temperature band declared by the manufacturer, within a tolerance of 0,3%/K		N/A
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7.2.4.2	Operational performance capability		
7.2.4.2 part 1	The operational performance off-load for which the tests are made with the control circuits energized and the main circuit not energized, in order to demonstrate that the equipment meets the operating conditions specified at the upper and lower limits of supply voltage and/or pressure specified for the control circuit during closing and opening operations		N/A
	The operational performance on-load during which the equipment shall make and break the specified current corresponding, where relevant, to its utilization category for the number of operations stated in the relevant product standard		P

<b>8</b>	<b>TESTS</b>		
8.2.1	Materials		
8.2.1.1	Test of resistance to abnormal heat and fire		
8.2.1.1.1	Glow wire test (on equipment)		
	The glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11 are performed on		
	the equipment; or		N/A
	sections taken from the equipment; or		P
	any parts of identical material having representative cross-section.		N/A
8.2.1.1.2	Flammability		
	flammability test, in accordance with IEC 60695-11-10;		
	hot wire ignition (HWI) test, as described in Annex M;		
	arc ignition (AI) test, as described in Annex M.		
8.2.4	Mechanical properties of terminals		
	Mechanical strength of terminals		
	maximum cross-sectional area of conductor (mm <sup>2</sup> ) :	50	
	diameter of thread (mm) :	6,8	
	torque (Nm) :	3,5	
	5 times on 2 separate clamping units		P
	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm <sup>2</sup> ) :	16	
	number of conductors of the smallest cross section :	1	
	diameter of bushing hole (mm) :	13,0	
	height between the equipment and the platen :	300	



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Clause	Requirement + Test	Result - Remark	Verdict
	mass at the conductor(s) (kg) :	2,9	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) :	100	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	conductor of the largest cross-sectional area (mm <sup>2</sup> ) :	50	
	number of conductors of the largest cross section :	1	
	diameter of bushing hole (mm) :	15,9	
	height between the equipment and the platen :	343	
	mass at the conductor(s) (kg) :	9,5	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) :	236	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	conductor of the largest and smallest cross-sectional area (mm <sup>2</sup> ) :	16/50	
	number of conductors of the smallest cross section, number of conductors of the largest cross section :	1/1	
	diameter of bushing hole (mm) :	13,0/15,9	
	height between the equipment and the platen :	300/345	
	mass at the conductor(s) (kg) :	2,9/9,5	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		
	force (N) :	100/236	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS3 - 1 sample: I-1, I <sub>n</sub> = 125A, 4P		
8.3.3.2	Test of tripping limits and characteristic		
8.3.3.2.2	Short circuit releases		
	Manufacturer's name or trademark	<b>Aoelec</b>	
	Type designation or serial number	AUB2	
	Sample no:	I-1	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated current: I <sub>n</sub> (A)	125	
	Ambient temperature 10-40 °C :	30°C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 I <sub>n</sub>	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	<b>Electromagnetic over current releases</b>		
	Test current: 80% of the rated, <del>or minimum adjustable setting</del> current: (A)	0,8x10I <sub>n</sub> =1,0kA	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: >0,2s L1-L3: >0,2s L2-L3: >0,2s L3-L4: >0,2s L1-L4: >0,2s L2-L4: >0,2s		P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, <del>or minimum adjustable setting</del> current: (A)	1,2x10I <sub>n</sub> =1,50kA	P
	Operating time: <0,2s in case of instantaneous releases: L1-L2: 19ms L1-L3: 10ms L2-L3: 14ms L3-L4: 13ms L1-L4: 12ms L2-L4: 11ms		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2-L3-L4:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2-L3-L4:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: tripping current declared for single pole operation (A)	1,2x10In=1,5kA	P
	Operating time: < 0,2 s in case of instantaneous release: L1: L2: L3: L4:	15ms 12ms 16ms 17ms	P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	<b>Electronic over current releases</b>		
	For circuit-breakers with an electronic over current release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.2.3	Overload releases		
a)	Instantaneous or definite time-delay releases		
	Rated operational voltage: $U_e$ (V)		
	Rated current: $I_n$ (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Rated operational voltage: $U_e$ (V)	415	

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current: In (A)	125	
	For releases dependent of ambient air temperature: Reference temperature(°C )	30°C	P
	Test ambient temperature (°C )	30°C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermal-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	30°C	P
	Thermal Magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, <del>or minimum adjustable setting</del> current: (A)	131	P
	Conventional non-tripping time: <del>1h when In &lt; 63A, 2h when In &gt; 63 A</del>	>2h	P
	Test current: 130% of the rated, <del>or minimum adjustable setting</del> current: (A)	163	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <del>1h when In &lt; 63A, 2h when In &gt; 63 A</del>	57s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Conventional tripping time: <del>&lt;1h when <math>I_n &lt; 63A</math>, &lt;2h when <math>I_n &gt; 63A</math></del>		N/A
	Thermal Magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: 105% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$ , 2h when $I_n > 63A$		N/A
	Test current: 130% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$ , <2h when $I_n > 63A$		N/A
	Test current: 105% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$ , 2h when $I_n > 63A$		N/A
	Test current: 130% of the <b>maximum</b> adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$ , <2h when $I_n > 63A$		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	30°C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	30°C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	2 $I_n$ =250A	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	1min07s	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A
8.3.3.2.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the <b>minimum</b> adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s)      L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s)      L1: L2: L3:		N/A
	Test current: 1,5 times of <b>maximum</b> adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s)      L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s)      L1: L2: L3:		N/A
8.3.3.3	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	4	P
	- sea level of the laboratory:	5m	P
	- test Uimp main circuits (kV) :	4,8	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	6,2	P
a)	Application of test voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and:		N/A
	- the main circuit		
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the tests		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	690	P
	- main circuits, test voltage for 1 min (V)	1890	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2)	- where appropriate, between each part of the control and auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		N/A
(i)	the normal positions of operation include the tripped position, if any;		N/A
(ii)	circuits incorporating solid-state devices connected to the main circuit shall be disconnected for the test;		N/A
(iii)	circuit-breakers not declared as suitable for isolation shall be tested with the test voltage applied across the poles of the main circuit, the line terminals being connected together and the load terminals being connected together.		N/A
(iv)	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$ , and shall not exceed $0,5\text{mA}$ .	457V 8,50 $\mu\text{A}$ (Max.)	P
(v)	circuit-breakers having a rated insulation voltage greater than 1 000 V a.c. shall be tested at a voltage of $U_i + 1\,200\text{ V a.c. r.m.s.}$ or $2 U_i$ whichever is the greater		N/A
(vi)	withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		N/A
8.3.3.4	Mechanical operation and operational performance capability		
8.3.3.4.2	Construction and mechanical operation		
8.3.3.4.2.1	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.2		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		N/A
8.3.3.4.2.2	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.4		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
8.3.3.4.2.3	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.7		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
8.3.3.4.2.4	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+55\text{ °C} \pm 2\text{ °C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.4.3	Operational performance capability without current.		
	Rated control supply voltage of closing mechanism: $U_c$ (V)	-	
	Rated control supply voltage of shunt releases: $U_c$ (V)	-	
	Rated control supply voltage undervoltage releases: $U_c$ (V)	-	
	Ambient temperature 10-40 :	22,7 °C	P
	Number of operating cycles per hour	120	P
	Number of cycles without current (total) (closing mechanism energized at the rated $U_c$ )		N/A
	Number of cycles without current (without releases)	7000	P
	Applied voltage of closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated $U_c$		N/A
	Applied voltage: shunt releases (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated $U_c$		N/A
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.4.4	Operational performance capability with current.		
	Rated current: $I_n$ (A)	125	
	Maximum rated operational voltage: $U_e$ (V)	415	
	Conductor cross-sectional area ( $\text{mm}^2$ ) :	50	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	1000	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	420 420 420	P
	- test current $I/I_e = 1,0$ (A) ..... L1: ..... L2: ..... L3:	126 126 126	P
	- power factor/time constant:	0,80	P
	- frequency: (Hz)	50	P
	- on-time (ms):	480	P
	- off-time (s):	30	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.5	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Rated control supply voltage of closing mechanism: Uc (V)	-	
	Rated control supply voltage of shunt releases: Uc (V)	-	
	Rated control supply voltage undervoltage releases: Uc (V)	-	
	Ambient temperature 10-40 °C :	28°C	P
	Maximum rated operational voltage: Ue (V)	415V~	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated Uc)	12	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A
	Conditions, overload operations:		
	- test voltage U/Ue = 1,05 (V) ..... L1: ..... L2: ..... L3:	440 440 440	P
	- test current AC/DC: I/Ie = 6,0/2,5 (kA) ..... L1: ..... L2: ..... L3:	764 764 764	P
	- power factor/time constant:	0,48	P
	- Number of cycles manually opened: 9	9	P
	- Number of cycles automatically opened by an overload release: 3	3	P
	for circuit-breakers having a short-circuit release of a maximum setting less than the test current		
	all 12 operations automatic		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	If the testing means do not withstand the let-through energy occurring during the automatic operation		
	– 12 manual operations – three additional operations with automatic opening, made at any convenient voltage		N/A
	- frequency: (Hz)	50Hz	P
	- on-time max 2s:	< 2s	P
	Operating rate if different from Table 8		N/A
8.3.3.6	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 60 seconds	1000V	P
	- no breakdown or flashover		P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 U <sub>e</sub> , and shall not exceed 2 mA.	457V 9,10μA(maximum)	P
8.3.3.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals ≤ 80K (K) :	70 (Max.)	P
	conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	test current I <sub>e</sub> (A) :	125	P
8.3.3.8	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	181 (Test at 30° C)	P
	Conventional tripping time: 1h when I <sub>n</sub> < 63A, 2h when I <sub>n</sub> > 63A	2min04s	P
8.3.3.9	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.10	Verification of the main contact position for circuit-breakers for isolation		
	actuating force for opening (N) .....	12	—
	test force with blocked main contacts for 10 s (N) :	50	—
	Dependent power operation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts ..... :		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P

8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS3 - 1 sample: I-2, I <sub>n</sub> = 125A, 3P		
8.3.3.3	Test of dielectric properties, impulse withstand voltage (U <sub>imp</sub> indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	4	P
	- sea level of the laboratory:	5m	P
	- test U <sub>imp</sub> main circuits (kV) :	4,8	P
	- test U <sub>imp</sub> auxiliary circuits (kV) :		N/A
	- test U <sub>imp</sub> control circuits (kV) :		N/A
	- test U <sub>imp</sub> on open main contacts (equipment suitable for isolating) (kV) :	6,2	P
a)	Application of test voltage		
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- no unintentional disruptive discharge during the tests		P
	Test of dielectric properties, dielectric withstand voltage (U <sub>imp</sub> not indicated):		
	- rated insulation voltage (V) :	690	P
	- main circuits, test voltage for 1 min (V)	1890	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		N/A
(i)	the normal positions of operation include the tripped position, if any;		N/A
(ii)	circuits incorporating solid-state devices connected to the main circuit shall be disconnected for the test;		N/A
(iii)	circuit-breakers not declared as suitable for isolation shall be tested with the test voltage applied across the poles of the main circuit, the line terminals being connected together and the load terminals being connected together.		N/A
(iv)	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 U <sub>e</sub> , and shall not exceed 0,5mA.	457V 11,8μA(Max.)	P

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Clause	Requirement + Test	Result - Remark	Verdict
(v)	circuit-breakers having a rated insulation voltage greater than 1 000 V a.c. shall be tested at a voltage of $U_i + 1\,200\text{ V a.c. r.m.s.}$ or $2\,U_i$ whichever is the greater		N/A
(vi)	withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		N/A
8.3.3.4	Mechanical operation and operational performance capability		
8.3.3.4.2	Construction and mechanical operation		
8.3.3.4.2.1	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.2		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		N/A
8.3.3.4.2.2	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.4		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
8.3.3.4.2.3	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.7		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
8.3.3.4.2.4	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A


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Clause	Requirement + Test	Result - Remark	Verdict
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+55\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.4.3	Operational performance capability without current.		
	Rated control supply voltage of closing mechanism: $U_c$ (V)	-	
	Rated control supply voltage of shunt releases: $U_c$ (V)	-	
	Rated control supply voltage undervoltage releases: $U_c$ (V)	-	
	Ambient temperature 10-40 :	25 $^{\circ}\text{C}$	P
	Number of operating cycles per hour	120	P
	Number of cycles without current (total) (closing mechanism energized at the rated $U_c$ )		N/A
	Number of cycles without current (without releases)	7000	P
	Applied voltage of closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated $U_c$		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated $U_c$		N/A
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.4.4	Operational performance capability with current.		
	Rated current: $I_n$ (A)	125	

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Clause	Requirement + Test	Result - Remark	Verdict
	Maximum rated operational voltage: $U_e$ (V)	415	
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	1000	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	418 418 418	P
	- test current $I/I_e = 1,0$ (A) ..... L1: ..... L2: ..... L3:	129 129 129	P
	- power factor/time constant:	0,78	P
	- frequency: (Hz)	50	P
	- on-time (ms):	0,4s	P
	- off-time (s):	29,6s	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		P
8.3.3.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.5	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Rated control supply voltage of closing mechanism: $U_c$ (V)	-	
	Rated control supply voltage of shunt releases: $U_c$ (V)	-	
	Rated control supply voltage undervoltage releases: $U_c$ (V)	-	
	Ambient temperature 10-40 °C :	20,7°C	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Maximum rated operational voltage: $U_e$ (V)	415V~	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	12	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A
	Conditions, overload operations:		
	- test voltage $U/U_e = 1,05$ (V) ..... L1: ..... L2: ..... L3:	444 444 444	P
	- test current AC/DC: $I/I_e = 6,0/2,5$ (kA) ..... L1: ..... L2: ..... L3:	758 758 758	P
	- power factor/time constant:	0,49	P
	- Number of cycles manually opened: 9	9	P
	- Number of cycles automatically opened by an overload release: 3	3	P
	for circuit-breakers having a short-circuit release of a maximum setting less than the test current		
	all 12 operations automatic		N/A
	If the testing means do not withstand the let-through energy occurring during the automatic operation		
	– 12 manual operations – three additional operations with automatic opening, made at any convenient voltage		N/A
	- frequency: (Hz)	50Hz	P
	- on-time max 2s:	< 2s	P
	Operating rate if different from Table 8		N/A
8.3.3.6	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 60 seconds	1000V	P
	- no breakdown or flashover		P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$ , and shall not exceed 2 mA.	457V 21,4μA(maximum)	P
8.3.3.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		P



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Clause	Requirement + Test	Result - Remark	Verdict
	Temperature rise of main circuit terminals $\leq 80\text{K (K)}$ :	71 (Max.)	P
	conductor cross-sectional area ( $\text{mm}^2$ ) :	50	P
	test current $I_e$ (A) :	125	P
8.3.3.8	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)		N/A
	Conventional tripping time: <del>&lt;1h when <math>I_n &lt; 63\text{A}</math>, &lt;2h when <math>I_n &gt; 63\text{A}</math></del>		N/A
8.3.3.9	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.10	Verification of the main contact position for circuit-breakers for isolation		
	actuating force for opening (N) ..... :	22	—
	test force with blocked main contacts for 10 s (N) :	66	—
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts ..... :		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS3 - 1 sample: I-3, I <sub>n</sub> = 125A, 2P		
8.3.3.2	Test of tripping limits and characteristic		
8.3.3.2.2	Short circuit releases		
	Manufacturer's name or trademark		
	Type designation or serial number	AUB2	
	Sample no:	I-3	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated current: I <sub>n</sub> (A)	125	
	Ambient temperature 10-40 °C :	30,0°C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 I <sub>n</sub>	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	<b>Electromagnetic over current releases</b>		
	Test current: 80% of the rated, <del>or minimum adjustable setting</del> current: (A)	0,8x10I <sub>n</sub> =1,0kA	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2:	>0,2s	P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, <del>or minimum adjustable setting</del> current: (A)	1,2x10I <sub>n</sub> =1,50kA	P
	Operating time: <0,2s in case of instantaneous releases: L1-L2:	24ms	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the <b>maximum</b> adjustable setting current: (A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: >0,2s in case of instantaneous releases: L1-L2-L3-L4:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2-L3-L4:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: tripping current declared for single pole operation (A)	1,2x10In=1,50kA	P
	Operating time: < 0,2 s in case of instantaneous release: L1: L2:	26ms 26ms	P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	<b>Electronic over current releases</b>		
	For circuit-breakers with an electronic over current release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 120% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
8.3.3.2.3	Overload releases		
a)	Instantaneous or definite time-delay releases		
	Rated operational voltage: Ue (V)		
	Rated current: In (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Rated operational voltage: Ue (V)	415	
	Rated current: In (A)	125	
	For releases dependent of ambient air temperature: Reference temperature(°C )	30°C	P
	Test ambient temperature (°C )	30°C	P

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Clause	Requirement + Test	Result - Remark	Verdict
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermal-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	30°C	P
	Thermal Magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, <del>or minimum adjustable setting</del> current: (A)	131	P
	Conventional non-tripping time: <del>1h when In &lt; 63A, 2h when In &gt; 63 A</del>	>2h	P
	Test current: 130% of the rated, <del>or minimum adjustable setting</del> current: (A)	163	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <del>1h when In &lt; 63A, 2h when In &gt; 63 A</del>	1min49s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <del>&lt;1h when In &lt; 63A, &lt;2h when In &gt; 63 A</del>		N/A
	Thermal Magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 105% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$ , 2h when $I_n > 63A$		N/A
	Test current: 130% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$ , <2h when $I_n > 63A$		N/A
	Test current: 105% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when $I_n < 63A$ , 2h when $I_n > 63A$		N/A
	Test current: 130% of the <b>maximum</b> adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when $I_n < 63A$ , <2h when $I_n > 63A$		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	30°C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	30°C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	$2I_n=250A$	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	1min09s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A
8.3.3.2.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic): (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases</u> (electronic): (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the <b>minimum</b> adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>short-circuit releases (electromagnetic)</u> , shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s) L1: L2: L3:		N/A
	Test current: 1,5 times of <b>maximum</b> adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> , shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s) L1: L2: L3:		N/A
8.3.3.3	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	4	P
	- sea level of the laboratory:	5m	P
	- test Uimp main circuits (kV) :	4,8	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	6,3	P
a)	Application of test voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and:		N/A
	- the main circuit		
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the tests		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	690	P
	- main circuits, test voltage for 1 min (V)	1890	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2)	- where appropriate, between each part of the control and auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		N/A
(i)	the normal positions of operation include the tripped position, if any;		N/A
(ii)	circuits incorporating solid-state devices connected to the main circuit shall be disconnected for the test;		N/A
(iii)	circuit-breakers not declared as suitable for isolation shall be tested with the test voltage applied across the poles of the main circuit, the line terminals being connected together and the load terminals being connected together.		N/A
(iv)	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$ , and shall not exceed $0,5\text{mA}$ .	457V 1,72 $\mu\text{A}$ (Max.)	P
(v)	circuit-breakers having a rated insulation voltage greater than 1 000 V a.c. shall be tested at a voltage of $U_i + 1\,200\text{ V a.c. r.m.s.}$ or $2 U_i$ whichever is the greater		N/A
(vi)	withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		N/A
8.3.3.4	Mechanical operation and operational performance capability		
8.3.3.4.2	Construction and mechanical operation		
8.3.3.4.2.1	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.2		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		N/A
8.3.3.4.2.2	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.4		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
8.3.3.4.2.3	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.7		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
8.3.3.4.2.4	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+55\text{ °C} \pm 2\text{ °C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.4.3	Operational performance capability without current.		
	Rated control supply voltage of closing mechanism: $U_c$ (V)	-	
	Rated control supply voltage of shunt releases: $U_c$ (V)	-	
	Rated control supply voltage undervoltage releases: $U_c$ (V)	-	
	Ambient temperature 10-40 :	25 °C	P
	Number of operating cycles per hour	120	P
	Number of cycles without current (total) (closing mechanism energized at the rated $U_c$ )		N/A
	Number of cycles without current (without releases)	7000	P
	Applied voltage of closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated $U_c$		N/A
	Applied voltage: shunt releases (V)		N/A


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Clause	Requirement + Test	Result - Remark	Verdict
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated $U_c$		N/A
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.4.4	Operational performance capability with current.		
	Rated current: $I_n$ (A)	120	
	Maximum rated operational voltage: $U_e$ (V)	415	
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	1000	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	442 442 -	P
	- test current $I/I_e = 1,0$ (A) ..... L1: ..... L2: ..... L3:	128 128 -	P
	- power factor/time constant:	0,82	P
	- frequency: (Hz)	50	P
	- on-time (ms):	500	P
	- off-time (s):	29,6	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.5	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Rated control supply voltage of closing mechanism: Uc (V)	-	
	Rated control supply voltage of shunt releases: Uc (V)	-	
	Rated control supply voltage undervoltage releases: Uc (V)	-	
	Ambient temperature 10-40 °C :	25°C	P
	Maximum rated operational voltage: Ue (V)	415V~	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated Uc)	12	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A
	Conditions, overload operations:		
	- test voltage U/Ue = 1,05 (V) ..... L1: ..... L2: ..... L3:	444 444 -	P
	- test current AC/DC: I/Ie = 6,0/2,5 (kA) ..... L1: ..... L2: ..... L3:	766 766 -	P
	- power factor/time constant:	0,48	P
	- Number of cycles manually opened: 9	9	P
	- Number of cycles automatically opened by an overload release: 3	3	P
	for circuit-breakers having a short-circuit release of a maximum setting less than the test current		
	all 12 operations automatic		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	If the testing means do not withstand the let-through energy occurring during the automatic operation		
	– 12 manual operations – three additional operations with automatic opening, made at any convenient voltage		N/A
	- frequency: (Hz)	50Hz	P
	- on-time max 2s:	< 2s	P
	Operating rate if different from Table 8		N/A
8.3.3.6	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 60 seconds	1000V	P
	- no breakdown or flashover		P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 U <sub>e</sub> , and shall not exceed 2 mA.	457V 2,24μA(maximum)	P
8.3.3.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals ≤ 80K (K) :	66 (Max.)	P
	conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	test current I <sub>e</sub> (A) :	125	P
8.3.3.8	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	181 (Test at 30° C)	P
	Conventional tripping time: 1h when I <sub>n</sub> < 63A, 2h when I <sub>n</sub> > 63A	1min23s	P
8.3.3.9	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.10	Verification of the main contact position for circuit-breakers for isolation		
	actuating force for opening (N) .....	18	—
	test force with blocked main contacts for 10 s (N) :	54	—
	Dependent power operation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts ..... :		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P

8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS3 - 1 sample: I-4, I <sub>n</sub> = 125A, 1P		
8.3.3.2	Test of tripping limits and characteristic		
8.3.3.2.2	Short circuit releases		
	Manufacturer's name or trademark		
	Type designation or serial number	AUB2	
	Sample no:	I-4	
	Rated operational voltage: U <sub>e</sub> (V)	240	
	Rated current: I <sub>n</sub> (A)	125	
	Ambient temperature 10-40 °C :	30°C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	10 I <sub>n</sub>	P
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	<b>Electromagnetic over current releases</b>		
	Test current: 80% of the rated, <del>or minimum adjustable setting</del> current: (A)	0,8x10I <sub>n</sub> =1,0kA	P
	Operating time: >0,2s in case of instantaneous releases: L1:	>0,2s	P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, <del>or minimum adjustable setting</del> current: (A)	1,2x10I <sub>n</sub> =1,50kA	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: <0,2s in case of instantaneous releases: L1:	24ms	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2-L3-L4:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2-L3-L4:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: tripping current declared for single pole operation (A)		N/A
	Operating time: < 0,2 s in case of instantaneous release: L1:		N/A
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	<b>Electronic over current releases</b>		
	For circuit-breakers with an electronic over current release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		N/A
	Test current: 80% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.2.3	Overload releases		
a)	Instantaneous or definite time-delay releases		
	Rated operational voltage: $U_e$ (V)		
	Rated current: $I_n$ (A)		
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Rated operational voltage: $U_e$ (V)	240	

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current: In (A)	125	
	For releases dependent of ambient air temperature: Reference temperature(°C )	30°C	P
	Test ambient temperature (°C )	30°C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermal-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Range of adjustable setting current: (A)		N/A
	Releases, dependent of ambient air temperature: Reference temperature (°C)	30°C	P
	Thermal Magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, <del>or minimum adjustable setting</del> current: (A)	131	P
	Conventional non-tripping time: <del>1h when In &lt; 63A, 2h when In &gt; 63 A</del>	>2h	P
	Test current: 130% of the rated, <del>or minimum adjustable setting</del> current: (A)	163	P
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <del>1h when In &lt; 63A, 2h when In &gt; 63 A</del>	1min42s	P
	Test current: 105% of the maximum adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A		N/A
	Test current: 130% of the maximum adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Conventional tripping time: <del>&lt;1h when In &lt; 63A</del> , <2h when In > 63 A		N/A
	Thermal Magnetic releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: 105% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A		N/A
	Test current: 130% of the rated, or <b>minimum</b> adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A		N/A
	Test current: 105% of the <b>maximum</b> adjustable setting current: (A)		N/A
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A		N/A
	Test current: 130% of the <b>maximum</b> adjustable setting current: (A)		N/A
	For circuit-breakers having an identified neutral pole provided with an overload release (see 8.3.3.1.1), the test current at the conventional tripping current shall be multiplied by the factor 1,2.		N/A
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A		N/A
	An additional test, at a current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	30°C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	30°C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	2In=250A	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	1min09s	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A
8.3.3.2.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 1,5 times of the maximum adjustable setting current: (A)		N/A
	Operating time, <u>overload releases</u> : (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electromagnetic)</u> : (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> : (s) L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	<u>overload releases</u> : (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	<u>short-circuit releases</u>		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Test current: 1,5 times of the <b>minimum</b> adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s)      L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s)      L1: L2: L3:		N/A
	Test current: 1,5 times of <b>maximum</b> adjustable setting current: (A)		N/A
	non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	Rated current		N/A
	Operating time, <u>overload releases</u> : the circuit-breaker does not trip:		N/A
	Operating time, <u>short-circuit releases</u> (electromagnetic), shall not trip: (s)      L1-L2: L1-L3: L2-L3:		N/A
	Operating time, <u>short-circuit releases (electronic)</u> , shall not trip: (s)      L1: L2: L3:		N/A
8.3.3.3	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	4	P
	- sea level of the laboratory:	5m	P
	- test Uimp main circuits (kV) :	4,8	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :		N/A
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	6,3	P
a)	Application of test voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		N/A
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and:		N/A
	- the main circuit		
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) equipment suitable for isolation		P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the tests		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	690	P
	- main circuits, test voltage for 1 min (V)	1890	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A
8.3.3.2.2	Application of test voltage		
1)	with circuit-breaker in the closed position		
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		N/A
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2)	- where appropriate, between each part of the control and auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		N/A
(i)	the normal positions of operation include the tripped position, if any;		N/A
(ii)	circuits incorporating solid-state devices connected to the main circuit shall be disconnected for the test;		N/A
(iii)	circuit-breakers not declared as suitable for isolation shall be tested with the test voltage applied across the poles of the main circuit, the line terminals being connected together and the load terminals being connected together.		N/A
(iv)	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$ , and shall not exceed 0,5mA.	264V <1μA(Max.)	P
(v)	circuit-breakers having a rated insulation voltage greater than 1 000 V a.c. shall be tested at a voltage of $U_i + 1\,200\text{ V a.c. r.m.s.}$ or $2 U_i$ whichever is the greater		N/A
(vi)	withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		N/A
8.3.3.4	Mechanical operation and operational performance capability		
8.3.3.4.2	Construction and mechanical operation		
8.3.3.4.2.1	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.2		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		N/A
8.3.3.4.2.2	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.4		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
8.3.3.4.2.3	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.7		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
8.3.3.4.2.4	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+55\text{ °C} \pm 2\text{ °C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.4.3	Operational performance capability without current.		
	Rated control supply voltage of closing mechanism: $U_c$ (V)	-	
	Rated control supply voltage of shunt releases: $U_c$ (V)	-	
	Rated control supply voltage undervoltage releases: $U_c$ (V)	-	
	Ambient temperature 10-40 :	25 °C	P
	Number of operating cycles per hour	120	P
	Number of cycles without current (total) (closing mechanism energized at the rated $U_c$ )		N/A
	Number of cycles without current (without releases)	7000	P
	Applied voltage of closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated $U_c$		N/A
	Applied voltage: shunt releases (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated $U_c$		N/A
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.4.4	Operational performance capability with current.		
	Rated current: $I_n$ (A)	125	
	Maximum rated operational voltage: $U_e$ (V)	240	
	Conductor cross-sectional area ( $\text{mm}^2$ ) :	50	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	1000	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	254 - -	P
	- test current $I/I_e = 1,0$ (A) ..... L1: ..... L2: ..... L3:	126 - -	P
	- power factor/time constant:	0,81	P
	- frequency: (Hz)	50	P
	- on-time (ms):	441	P
	- off-time (s):	29,6	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.5	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Rated control supply voltage of closing mechanism: Uc (V)	-	
	Rated control supply voltage of shunt releases: Uc (V)	-	
	Rated control supply voltage undervoltage releases: Uc (V)	-	
	Ambient temperature 10-40 °C :	25°C	P
	Maximum rated operational voltage: Ue (V)	240V~	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated Uc)	12	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A
	Conditions, overload operations:		
	- test voltage U/Ue = 1,05 (V) ..... L1: ..... L2: ..... L3:	256 - -	P
	- test current AC/DC: I/Ie = 6,0/2,5 (kA) ..... L1: ..... L2: ..... L3:	765 - -	P
	- power factor/time constant:	0,48	P
	- Number of cycles manually opened: 9	9	P
	- Number of cycles automatically opened by an overload release: 3	3	P
	for circuit-breakers having a short-circuit release of a maximum setting less than the test current		
	all 12 operations automatic		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	If the testing means do not withstand the let-through energy occurring during the automatic operation		
	– 12 manual operations – three additional operations with automatic opening, made at any convenient voltage		N/A
	- frequency: (Hz)	50Hz	P
	- on-time max 2s:	< 2s	P
	Operating rate if different from Table 8		N/A
8.3.3.6	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 60 seconds	1000V	P
	- no breakdown or flashover		P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 U <sub>e</sub> , and shall not exceed 2 mA.	264V 1,12μA(maximum)	P
8.3.3.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals ≤ 80K (K) :	63 (Max.)	P
	conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	test current I <sub>e</sub> (A) :	125	P
8.3.3.8	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	182 (Test at 30° C)	P
	Conventional tripping time: 1h when I <sub>n</sub> < 63A, 2h when I <sub>n</sub> > 63A	1min40s	P
8.3.3.9	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -		N/A
	and shall operate at 35% of the maximum control supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		N/A
8.3.3.10	Verification of the main contact position for circuit-breakers for isolation		
	actuating force for opening (N) .....	8	—
	test force with blocked main contacts for 10 s (N) :	50	—
	Dependent power operation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts ..... :		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		P

8.3.4	TEST SEQUENCE II (Ics): - 1 sample: II-1, I <sub>n</sub> = 125A, 4P		
8.3.4.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	AUB2	
	Sample no:	II-1	
	Rated current: I <sub>n</sub> (A)	125	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated service short-circuit breaking capacity: (kA)	7,5	
	Rated control supply voltage of closing mechanism: U <sub>c</sub> (V)		
	Rated control supply voltage of shunt release: U <sub>c</sub> (V)		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U <sub>c</sub> : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- size of hole: <30mm <sup>2</sup>	25mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	3,5	P
8.3.4.2	Test of rated service short-circuit breaking capacity		--
	Test sequence of operation: O – t – CO – t – CO		--
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1: ..... L2: ..... L3:	444 444 444	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	7,56 7,81 7,61	P
	power factor/time constant :	0,48	P
	- Factor "n"	1,72	P
	- peak test current (kA) :	13,1	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	5,41 6,76 3,62	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	106 138 55,0	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	5,11 6,99 4,16	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	151 143 105	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	6,42 3,53 5,67	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	120 55,9 121	P
	Melting of the fusible element		N/A
	Damage to insulation on conductors		N/A
	Holes in the PE-sheet for test sequence "O"		N/A
	Cracks observed		N/A
8.3.4.3	Operational performance capability with current.		
	Rated current: $I_n$ (A)	125	
	Maximum rated operational voltage: $U_e$ (V)	415	
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	
	Number of operating cycles per hour	120	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	75	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	442 442 442	P
	- test current $I/I_e = 1,0$ (A)..... L1: ..... L2: ..... L3:	127 127 127	P
	- power factor/time constant:	0,78	P
	- frequency: (Hz)	50	P
	- on-time (ms):	500	P
	- off-time (s):	29,5	P
8.3.4.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1,1 $U_e$ )	457V 3,12μA (max.)	P
8.3.4.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	67K	P

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Clause	Requirement + Test	Result - Remark	Verdict
	conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	test current I <sub>e</sub> (A) :	125	P
8.3.4.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	182A (test at 30°C)	P
	Conventional tripping time: 1h when I <sub>n</sub> < 63A, <2h when I <sub>n</sub> > 63 A	1min19s	P
8.3.4	TEST SEQUENCE II (Ics): - 1 sample: II-2, I <sub>n</sub> = 63A, 4P		
8.3.4.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	AUB2	
	Sample no:	II-2	
	Rated current: I <sub>n</sub> (A)	63	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated service short-circuit breaking capacity: (kA)	7,5	
	Rated control supply voltage of closing mechanism: U <sub>c</sub> (V)		
	Rated control supply voltage of shunt release: U <sub>c</sub> (V)		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U <sub>c</sub> : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	16	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	3,5	P
8.3.4.2	Test of rated service short-circuit breaking capacity		--
	Test sequence of operation: O – t – CO – t – CO		--
	- test voltage $U/U_e = 1,05$ (V) ..... L1: ..... L2: ..... L3:	440 440 440	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	7,56 7,81 7,61	P
	power factor/time constant :	0,48	P
	- Factor "n"	1,7	P
	- peak test current (kA) :	12,0	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	2,38 5,20 5,88	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	13,5 61,7 106	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	3,22 4,55 5,92	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	25,2 56,4 117	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	6,08 5,04 4,46	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	152 41,4 58,3	P
	Melting of the fusible element		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Damage to insulation on conductors		N/A
	Holes in the PE-sheet for test sequence "O"		N/A
	Cracks observed		N/A
8.3.4.3	Operational performance capability with current.		
	Rated current: $I_n$ (A)	63	
	Maximum rated operational voltage: $U_e$ (V)	415	
	Conductor cross-sectional area ( $\text{mm}^2$ ) :	16	
	Number of operating cycles per hour	120	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	75	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	420 420 420	P
	- test current $I/I_e = 1,0$ (A)..... L1: ..... L2: ..... L3:	64 64 -	P
	- power factor/time constant:	0,80	P
	- frequency: (Hz)	50	P
	- on-time (ms):	500	P
	- off-time (s):	30	P
8.3.4.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: ( $<2\text{mA} / 1,1 U_e$ )	457V 5,80 $\mu\text{A}$ (max.)	P
8.3.4.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. $\leq 80 \text{ K (K)}$ :		N/A
	conductor cross-sectional area ( $\text{mm}^2$ ) :		N/A
	test current $I_e$ (A) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	91,4A (test at 30°C)	P
	Conventional tripping time: <1h when $I_n \leq 63A$ , <2h when $I_n > 63A$	3min01s	P
8.3.4	TEST SEQUENCE II (Ics): - 1 sample: II-3, $I_n = 125A$ , 2P		
8.3.4.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	AUB2	
	Sample no:	II-3	
	Rated current: $I_n$ (A)	125	
	Rated operational voltage: $U_e$ (V)	415	
	Rated service short-circuit breaking capacity: (kA)	7,5	
	Rated control supply voltage of closing mechanism: $U_c$ (V)		
	Rated control supply voltage of shunt release: $U_c$ (V)		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated $U_c$ (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	3,5	P
8.3.4.2	Test of rated service short-circuit breaking capacity		--
	Test sequence of operation: O – t – CO – t – CO		--
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1: ..... L2: ..... L3:	440 440 -	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	7,53 7,53 -	P
	power factor/time constant :	0,47	P
	- Factor "n"	1,7	P
	- peak test current (kA) :	13,0	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	6,51 6,51 -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	208 208 -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	3,59 3,59 -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	33,8 33,8 -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	6,49 6,49 -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	147 147 -	P
	Melting of the fusible element		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Damage to insulation on conductors		N/A
	Holes in the PE-sheet for test sequence "O"		N/A
	Cracks observed		N/A
8.3.4.3	Operational performance capability with current.		
	Rated current: $I_n$ (A)	125	
	Maximum rated operational voltage: $U_e$ (V)	415	
	Conductor cross-sectional area ( $\text{mm}^2$ ) :	50	
	Number of operating cycles per hour	120	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	75	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: 420 ..... L2: 420 ..... L3: -		P
	- test current $I/I_e = 1,0$ (A)..... L1: 126 ..... L2: 126 ..... L3: -		P
	- power factor/time constant:	0,80	P
	- frequency: (Hz)	50	P
	- on-time (ms):	510	P
	- off-time (s):	30	P
8.3.4.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: ( $<2\text{mA} / 1,1 U_e$ )	457V 6,30 $\mu$ A (max.)	P
8.3.4.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals. $\leq 80 \text{ K}$ (K) :	69K	P
	conductor cross-sectional area ( $\text{mm}^2$ ) :	50	P
	test current $I_e$ (A) :	125	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	182A (test at 30°C)	P
	Conventional tripping time: <1h when $I_n \leq 63A$ , <2h when $I_n > 63A$	3min28s	P
8.3.4	TEST SEQUENCE II (Ics): - 1 sample: II-4, $I_n = 63A$ , 2P		
8.3.4.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	AUB2	
	Sample no:	II-4	
	Rated current: $I_n$ (A)	63	
	Rated operational voltage: $U_e$ (V)	415	
	Rated service short-circuit breaking capacity: (kA)	7,5	
	Rated control supply voltage of closing mechanism: $U_c$ (V)		
	Rated control supply voltage of shunt release: $U_c$ (V)		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated $U_c$ (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: $<30mm^2$	$25mm^2$	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	16	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	3,5	P
8.3.4.2	Test of rated service short-circuit breaking capacity		--
	Test sequence of operation: O – t – CO – t – CO		--
	- test voltage $U/U_e = 1,05$ (V) ..... L1: ..... L2: ..... L3:	440 440 -	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	7,53 7,53 -	P
	power factor/time constant :	0,47	P
	- Factor "n"	1,7	P
	- peak test current (kA) :	13,0	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	1,83 1,83 -	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	6,26 6,26 -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	2,59 2,59 -	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	12,3 12,3 -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	4,71 4,71 -	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	55,7 55,7 -	P
	Melting of the fusible element		N/A
	Damage to insulation on conductors		N/A
	Holes in the PE-sheet for test sequence "O"		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Cracks observed		N/A
8.3.4.3	Operational performance capability with current.		
	Rated current: $I_n$ (A)	63	
	Maximum rated operational voltage: $U_e$ (V)	415	
	Conductor cross-sectional area ( $\text{mm}^2$ ) :	16	
	Number of operating cycles per hour	120	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	75	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	420 420 -	P
	- test current $I/I_e = 1,0$ (A)..... L1: ..... L2: ..... L3:	64 64 -	P
	- power factor/time constant:	0,80	P
	- frequency: (Hz)	50	P
	- on-time (ms):	520	P
	- off-time (s):	30	P
8.3.4.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: ( $<2\text{mA} / 1,1 U_e$ )	457V 5,30 $\mu\text{A}$ (max.)	P
8.3.4.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. $\leq 80 \text{ K}$ (K) :		N/A
	conductor cross-sectional area ( $\text{mm}^2$ ) :		N/A
	test current $I_e$ (A) :		N/A
8.3.4.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	91,4A (test at 30°C)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conventional tripping time: <del>&lt;1h when In &lt; 63A</del> , <2h when In > 63 A	2min19s	P
8.3.4	TEST SEQUENCE II (Ics): - 1 sample: II-5, In= 125A, 1P		
8.3.4.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	AUB2	
	Sample no:	II-5	
	Rated current: In (A)	125	
	Rated operational voltage: Ue (V)	240	
	Rated service short-circuit breaking capacity: (kA)	7,5	
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	3,5	P
8.3.4.2	Test of rated service short-circuit breaking capacity		--
	Test sequence of operation: O – t – CO – t – CO		--
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1: ..... L2: ..... L3:	256 - -	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	7,53 - -	P
	power factor/time constant :	0,48	P
	- Factor "n"	1,7	P
	- peak test current (kA) :	12,3	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	2,67 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	44,3 - -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	6,45 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	195 - -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	6,00 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	141 - -	P
	Melting of the fusible element		N/A
	Damage to insulation on conductors		N/A
	Holes in the PE-sheet for test sequence "O"		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Cracks observed		N/A
8.3.4.3	Operational performance capability with current.		
	Rated current: $I_n$ (A)	125	
	Maximum rated operational voltage: $U_e$ (V)	240	
	Conductor cross-sectional area ( $\text{mm}^2$ ) :	50	
	Number of operating cycles per hour	120	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	75	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	243 - -	P
	- test current $I/I_e = 1,0$ (A)..... L1: ..... L2: ..... L3:	126 - -	P
	- power factor/time constant:	0,78	P
	- frequency: (Hz)	50	P
	- on-time (ms):	530	P
	- off-time (s):	30	P
8.3.4.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: ( $<2\text{mA} / 1,1 U_e$ )	264V 6,40 $\mu$ A (max.)	P
8.3.4.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals. $\leq 80 \text{ K (K)}$ :	67	P
	conductor cross-sectional area ( $\text{mm}^2$ ) :	50	P
	test current $I_e$ (A) :	125	P
8.3.4.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	181A (test at 30°C)	P



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Clause	Requirement + Test	Result - Remark	Verdict
	Conventional tripping time: <del>&lt;1h when In &lt; 63A</del> , <2h when In > 63 A	2min11s	P
8.3.4	TEST SEQUENCE II (Ics): - 1 sample: II-6, In= 63A, 1P		
8.3.4.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	AUB2	
	Sample no:	II-6	
	Rated current: In (A)	63	
	Rated operational voltage: Ue (V)	240	
	Rated service short-circuit breaking capacity: (kA)	7,5	
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm <sup>2</sup> ) :	16	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	3,5	P
8.3.4.2	Test of rated service short-circuit breaking capacity		--
	Test sequence of operation: O – t – CO – t – CO		--
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1: ..... L2: ..... L3:	256 - -	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	7,53 - -	P
	power factor/time constant :	0,48	P
	- Factor "n"	1,7	P
	- peak test current (kA) :	12,3	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	4,66 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	114 - -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	4,82 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	66,5 - -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	2,49 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	14,5 - -	P
	Melting of the fusible element		N/A
	Damage to insulation on conductors		N/A
	Holes in the PE-sheet for test sequence "O"		N/A
	Cracks observed		N/A
8.3.4.3	Operational performance capability with current.		
	Rated current: I <sub>n</sub> (A)	63	

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Clause	Requirement + Test	Result - Remark	Verdict
	Maximum rated operational voltage: $U_e$ (V)	240	
	Conductor cross-sectional area ( $\text{mm}^2$ ) :	16	
	Number of operating cycles per hour	120	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated $U_c$ )	75	P
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		
	- test voltage $U/U_e = 1,0$ (V) ..... L1: ..... L2: ..... L3:	243 - -	P
	- test current $I/I_e = 1,0$ (A)..... L1: ..... L2: ..... L3:	64 - -	P
	- power factor/time constant:	0,80	P
	- frequency: (Hz)	50	P
	- on-time (ms):	550	P
	- off-time (s):	30	P
8.3.4.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: ( $<2\text{mA} / 1,1 U_e$ )	264V 5,10 $\mu\text{A}$ (max.)	P
8.3.4.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. $\leq 80 \text{ K (K)}$ :		N/A
	conductor cross-sectional area ( $\text{mm}^2$ ) :		N/A
	test current $I_e$ (A) :		N/A
8.3.4.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	91,4A (test at 30°C)	P
	Conventional tripping time: <del><math>&lt;1\text{h}</math> when <math>I_n &lt; 63\text{A}</math>, <math>&lt;2\text{h}</math> when <math>I_n &gt; 63\text{A}</math></del>	57s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity - 1 sample: III-1, I <sub>n</sub> = 125A, 4P		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-1	
	Rated current: I <sub>n</sub> (A)	125	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated ultimate short-circuit breaking capacity: (kA)	10,0	
	Rated control supply voltage of closing mechanism: U <sub>c</sub> (V)	-	
	Rated control supply voltage of shunt release: U <sub>c</sub> (V)	-	
	This test sequence need not be made when I <sub>cu</sub> = I <sub>cs</sub>		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	250A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min14s 2min01s 3min08s 2min30s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U <sub>c</sub> : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1:	440	P
	..... L2:	440	
	..... L3:	440	
	- r.m.s. test current AC/DC: (kA) ..... L1:	10,1	P
	..... L2:	10,7	
	..... L3:	10,2	
	power factor/time constant :	0,49	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	17,0	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1:	8,91	P
	..... L2:	7,14	
	..... L3:	5,76	
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1:	158	P
	..... L2:	69,0	
	..... L3:	48,4	
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1:	8,33	P
	..... L2:	4,25	
	..... L3:	8,37	

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Clause	Requirement + Test	Result - Remark	Verdict
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	118 48,2 138	P
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	457V 11,3μA (max.)	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	313A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min12s 1min48s 2min19s 2min01s	P

8.3.5	TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity - 1 sample: III-2, I <sub>n</sub> = 125A, 4P <b>Tested on the 4<sup>th</sup> pole and its adjacent pole</b>		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-2	
	Rated current: I <sub>n</sub> (A)	125	
	Rated operational voltage: U <sub>e</sub> (V)	415	

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated ultimate short-circuit breaking capacity: (kA)	10	
	Rated control supply voltage of closing mechanism: Uc (V)	-	
	Rated control supply voltage of shunt release: Uc (V)	-	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	250A (Test at 30° C)	P
	- Operation time: (s) ..... L3: ..... L4:	2min19s 2min36s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L3: ..... L4:	256 256	P
	- r.m.s. test current AC/DC: (kA)..... L3: ..... L4:	6,04 6,04	P
	power factor/time constant :	0,48	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	10,1	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L3: ..... L4:	5,89 5,89	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L3: ..... L4:	133 133	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L3: ..... L4:	3,87 3,87	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L3: ..... L4:	30,7 30,7	P
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U <sub>e</sub> )	457V 12,9µA (max.)	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	158A (Test at 30° C)	P
	- Operation time: (s) ..... L3: ..... L4:	2min01s 1min49s	P



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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity - 1 sample: III-3, I <sub>n</sub> = 63A, 4P		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-3	
	Rated current: I <sub>n</sub> (A)	63	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated ultimate short-circuit breaking capacity: (kA)	10,0	
	Rated control supply voltage of closing mechanism: U <sub>c</sub> (V)	-	
	Rated control supply voltage of shunt release: U <sub>c</sub> (V)	-	
	This test sequence need not be made when I <sub>cu</sub> = I <sub>cs</sub>		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	126A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	2min48s 2min36s 1min52s 3min08s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U <sub>c</sub> : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	16	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1: ..... L2: ..... L3:	440 440 440	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	10,1 10,7 10,3	P
	power factor/time constant :	0,49	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	17,0	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	7,15 2,09 5,65	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	91,3 6,15 58,8	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	2,72 5,77 7,15	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	10,6 48,2 102	P
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	457V 11,7μA (max.)	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	158A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min59s 2min12s 1min28s 2min31s	P

8.3.5	TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity - 1 sample: III-4, I <sub>n</sub> = 63A, 4P <b>Tested on the 4<sup>th</sup> pole and its adjacent pole</b>		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-4	
	Rated current: I <sub>n</sub> (A)	63	
	Rated operational voltage: U <sub>e</sub> (V)	415	

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated ultimate short-circuit breaking capacity: (kA)	10	
	Rated control supply voltage of closing mechanism: Uc (V)	-	
	Rated control supply voltage of shunt release: Uc (V)	-	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	126A (Test at 30° C)	P
	- Operation time: (s) ..... L3: ..... L4:	2min59s 2min31s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm <sup>2</sup> ) :	16	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L3: ..... L4:	256 256	P
	- r.m.s. test current AC/DC: (kA)..... L3: ..... L4:	6,04 6,04	P
	power factor/time constant :	0,48	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	10,1	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L3: ..... L4:	3,47 3,47	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L3: ..... L4:	24,0 24,0	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L3: ..... L4:	3,42 3,42	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L3: ..... L4:	23,0 23,0	P
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U <sub>e</sub> )	457V 13,8μA (max.)	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	158A (Test at 30° C)	P
	- Operation time: (s) ..... L3: ..... L4:	2min16s 2min01s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity - 1 sample: III-5, I <sub>n</sub> = 125A, 3P		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-5	
	Rated current: I <sub>n</sub> (A)	125	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated ultimate short-circuit breaking capacity: (kA)	10,0	
	Rated control supply voltage of closing mechanism: U <sub>c</sub> (V)	-	
	Rated control supply voltage of shunt release: U <sub>c</sub> (V)	-	
	This test sequence need not be made when I <sub>cu</sub> = I <sub>cs</sub>		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	250A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min07s 1min29s 1min16s -	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated U <sub>c</sub> : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1:	444	P
	..... L2:	444	
	..... L3:	444	
	- r.m.s. test current AC/DC: (kA) ..... L1:	10,1	P
	..... L2:	10,4	
	..... L3:	10,1	
	power factor/time constant :	0,48	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	17,2	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1:	4,73	P
	..... L2:	5,12	
	..... L3:	2,20	
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1:	85,1	P
	..... L2:	83,1	
	..... L3:	25,0	
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1:	5,89	P
	..... L2:	5,76	
	..... L3:	5,39	

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Clause	Requirement + Test	Result - Remark	Verdict
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	115 230 93,7	P
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	457V 20,2μA (max.)	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	313A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	37s 33s 36s -	P
8.3.5	TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity - 1 sample: III-6, I <sub>n</sub> = 125A, 2P		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-6	
	Rated current: I <sub>n</sub> (A)	125	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated ultimate short-circuit breaking capacity: (kA)	10,0	



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Clause	Requirement + Test	Result - Remark	Verdict
	Rated control supply voltage of closing mechanism: Uc (V)	-	
	Rated control supply voltage of shunt release: Uc (V)	-	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	250A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	2min16s 2min41s - -	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P

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Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V) ..... L1: ..... L2: ..... L3:	440 440 -	P
	- r.m.s. test current AC/DC: (kA)..... L1: ..... L2: ..... L3:	10,3 10,3 -	P
	power factor/time constant :	0,46	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	18,5	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	6,91 6,91 -	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	82,6 82,6 -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	7,08 7,08 -	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	133 133 -	P
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U <sub>e</sub> )	457V 10,3μA (max.)	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	313A (Test at 30°C)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min59s 2min11s - -	P
8.3.5	TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity - 1 sample: III-7, I <sub>n</sub> = 63A, 2P		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-7	
	Rated current: I <sub>n</sub> (A)	63	
	Rated operational voltage: U <sub>e</sub> (V)	415	
	Rated ultimate short-circuit breaking capacity: (kA)	10,0	
	Rated control supply voltage of closing mechanism: U <sub>c</sub> (V)	-	
	Rated control supply voltage of shunt release: U <sub>c</sub> (V)	-	
	This test sequence need not be made when I <sub>cu</sub> = I <sub>cs</sub>		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	128A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min39s 2min18s - -	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	closing mechanism energized with 85% at the rated $U_c$ : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	16	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V) ..... L1: ..... L2: ..... L3:	440 440 -	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	10,3 10,3 -	P
	power factor/time constant :	0,46	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	18,5	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	6,05 6,05 -	P
	- Joule integral $I^2dt$ (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	79,5 79,5 -	P
	Pause, t: (min)	3	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1:	6,19	P
	..... L2:	6,19	
	..... L3:	-	
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1:	95,6	P
	..... L2:	95,6	
	..... L3:	-	
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U <sub>e</sub> )	457V 15,8μA (max.)	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	158A (Test at 30°C)	P
	- Operation time: (s) ..... L1:	1min32s	P
	..... L2:	1min41s	
	..... L3:	-	
	..... L4:	-	
8.3.5	TEST SEQUENCE III (I <sub>cu</sub> ): Rated ultimate short-circuit breaking capacity - 1 sample: III-8, I <sub>n</sub> = 125A, 1P		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-8	

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current: In (A)	125	
	Rated operational voltage: Ue (V)	240	
	Rated ultimate short-circuit breaking capacity: (kA)	10,0	
	Rated control supply voltage of closing mechanism: Uc (V)	-	
	Rated control supply voltage of shunt release: Uc (V)	-	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	250A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min39s - - -	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1: ..... L2: ..... L3:	256 - -	P
	- r.m.s. test current AC/DC: (kA) ..... L1: ..... L2: ..... L3:	10,2 - -	P
	power factor/time constant :	0,47	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	17,2	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	7,44 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	101 - -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	5,70 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	52,2 - -	P
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U <sub>e</sub> )	264V 6,90μA (max.)	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	313A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min08s - - -	P
8.3.5	TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity - 1 sample: III-9, I <sub>n</sub> = 63A, 1P		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence applies, this test sequence applies to circuit-breaker of utilization category A and to circuit-breaker of utilization B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of utilization B having a rated short-time withstand current equal to their rated ultimate short-circuit breaking capacity, this test sequence need not be made, since, in this case, the ultimate short-circuit breaking capacity, is verified when carrying out test sequence IV.		
	For integrally fused circuit-breakers, test sequence V applies in place of this sequence.		
	Type designation or serial number	AUB2	
	Sample no:	III-9	
	Rated current: I <sub>n</sub> (A)	63	
	Rated operational voltage: U <sub>e</sub> (V)	240	
	Rated ultimate short-circuit breaking capacity: (kA)	10,0	
	Rated control supply voltage of closing mechanism: U <sub>c</sub> (V)	-	
	Rated control supply voltage of shunt release: U <sub>c</sub> (V)	-	
	This test sequence need not be made when I <sub>cu</sub> = I <sub>cs</sub>		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	128A (Test at 30°C)	P



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Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	2min53s - - -	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated $U_c$ : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ) :	16	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	- test voltage $U/U_e = 1,05$ (V) ..... L1: ..... L2: ..... L3:	256 - -	P
	- r.m.s. test current AC/DC: (kA)..... L1: ..... L2: ..... L3:	10,2 - -	P
	power factor/time constant :	0,47	P
	- Factor "n"	1,7	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- peak test current (kA <sub>max</sub> ) :	17,2	P
	Test sequence "O"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	5,46 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	57,2 - -	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1: ..... L2: ..... L3:	5,61 - -	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1: ..... L2: ..... L3:	58,6 - -	P
	Melting of the fusible element	No	P
	Damage to insulation on conductors	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 U <sub>e</sub> )	264V 9,00µA (max.)	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	158A (Test at 30°C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	2min08s - - -	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.6.2	TEST SEQUENCE IV (Icw): Rated short-time withstand current		
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8.3.7	TEST SEQUENCE V: Performance of integrally fused circuit-breakers		
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8.3.8	TEST SEQUENCE VI: Combined test sequence		
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Annex B	Circuit-breakers incorporating residual current protection		
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Annex C	Individual pole short-circuit test sequence		
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Annex F	Additional tests for circuit-breakers with electronic over-current protection		
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Clause	Requirement + Test	Result - Remark	Verdict
Annex H	Individual pole short-circuit test sequence - 1 sample: H-1, $I_n = 125A$ , 4P		
	Circuit-breaker for use in IT systems		
H.2	Test of individual pole short-circuit breaking capacity		
	A short-circuit test is made on the individual poles of a multipole circuit-breaker at a value of prospective current ( $I_{IT}$ ) equal to 1,2 times the maximum setting of the short-time delay release tripping current or, in the absence of such a release, 1,2 time the max. setting of the tripping current of the instantaneous release, or, where relevant 1,2 times the maximum setting of the definite time delay release tripping current, but not less than 500 A nor exceeding 50kA.		
	Type designation or serial number	AUB2	
	Sample no:	H-1	
	Rated current: $I_n$ (A)	125	
	Rated operational voltage: $U_e$ (V)	415	
	Rated ultimate short-circuit breaking capacity: (kA)	10,0	
	Rated control supply voltage of closing mechanism: $U_c$ (V)		
	Rated control supply voltage of shunt release: $U_c$ (V)		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated $U_c$ : (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: $<30mm^2$	25 $mm^2$	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ):	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	Test circuit according figure: 9		P
	- test voltage $U/U_e = 1,05$ (V) ..... L1:	444	P
	Short-circuit test current ( $I_{IT}$ ): equal to 1,2 times the max. setting of the short-time delay release tripping current,		N/A
	or, in the absence of such a release, 1,2 time the max. setting of the tripping current of the instantaneous release,	$I_{IT}=1,50\text{kA}$	P
	or, where relevant 1,2 times the max. setting of the definite time delay release tripping current, but not exceeding 50kA.		N/A
	- r.m.s. test current AC/DC: (A)	1,51kA	P
	power factor/time constant:	0,49	P
	- Factor "n"	1,7	P
	- peak test current ( $kA_{max}$ ) :	2,70	P
	Test sequence "O" L1		
	- max. let-through current: ( $kA_{peak}$ ) ..... L1:	0,98	P
	- Joule integral $I^2dt$ ( $kA^2s$ ) ..... L1:	1,53	P
	Pause, t: (min)	3	P
	Test sequence "CO" L1		
	- max. let-through current: ( $kA_{peak}$ ) ..... L1:	0,95	P
	- Joule integral $I^2dt$ ( $kA^2s$ ) ..... L1:	1,41	P
	Test sequence "O" L2		
	- max. let-through current: ( $kA_{peak}$ ) ..... L2:	0,88	P
	- Joule integral $I^2dt$ ( $kA^2s$ ) ..... L2:	1,45	P
	Pause, t: (min)	3	P
	Test sequence "CO" L2		
	- max. let-through current: ( $kA_{peak}$ ) ..... L2:	0,81	P
	- Joule integral $I^2dt$ ( $kA^2s$ ) ..... L2:	1,15	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "O" L3		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L3:	0,76	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L3:	1,10	P
	Pause, t: (min)	3	P
	Test sequence "CO" L3		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L3:	0,96	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L3:	1,62	P
	Test sequence "O" L4		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L4:	0,98	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L4:	1,55	P
	Test sequence "CO" L4		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L4:	0,96	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L4:	1,45	P
	For 4-pole circuit-breakers with a protected neutral pole, the test voltage for that pole shall be phase-to-phase voltage divided by $\sqrt{3}$ . This test is applicable only where the construction of the protected neutral pole differs from that of the phase poles.		N/A
	Test sequence "O" N		
	- max. let-through current: (kA <sub>peak</sub> ) ..... N:		N/A
	- Joule integral I <sup>2</sup> dt (A <sup>2</sup> s) ..... N:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO" N		
	- max. let-through current: (kA <sub>peak</sub> ) ..... N:		N/A
	- Joule integral I <sup>2</sup> dt (A <sup>2</sup> s) ..... N:		N/A
	Melting of the fusible element		N/A
	Damage to insulation on conductors		N/A
	Holes in the PE-sheet for test sequence "O"		N/A
	Cracks observed		N/A
H.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P


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Clause	Requirement + Test	Result - Remark	Verdict
H.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2.5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	313A (Test at 30° C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	31s 34s 36s 39s	P
H.5	Marking		
	Circuit-breaker for which all values of rated voltage have not been tested according to this annex or are not covered by such testing, shall be identified by the symbol  which shall be marked on the circuit-breaker immediately following these values of rated voltage		N/A

Annex H	Individual pole short-circuit test sequence - 1 sample: H-2, I <sub>n</sub> = 125A, 2P	
	Circuit-breaker for use in IT systems	
H.2	Test of individual pole short-circuit breaking capacity	
	A short-circuit test is made on the individual poles of a multipole circuit-breaker at a value of prospective current (I <sub>IT</sub> ) equal to 1,2 times the maximum setting of the short-time delay release tripping current or, in the absence of such a release, 1,2 time the max. setting of the tripping current of the instantaneous release, or, where relevant 1,2 times the maximum setting of the definite time delay release tripping current, but not less than 500 A nor exceeding 50kA.	
	Type designation or serial number	AUB2
	Sample no:	H-2
	Rated current: I <sub>n</sub> (A)	125
	Rated operational voltage: U <sub>e</sub> (V)	415
	Rated ultimate short-circuit breaking capacity: (kA)	10,0
	Rated control supply voltage of closing mechanism: U <sub>c</sub> (V)	
	Rated control supply voltage of shunt release: U <sub>c</sub> (V)	
	The test sequence of operations is O – t - CO	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	N/A
	closing mechanism energized with 85% at the rated U <sub>c</sub> : (V)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Back: 0mm Front: 0mm Top: 45mm Bottom: 45mm Left: 0mm Right: 0mm	P
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		P
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65	0,50	P
	- size of hole: <30mm <sup>2</sup>	25 mm <sup>2</sup>	P
	- finish: bare or conductive plating	Bare	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A
	Fuse "F": copper wire: diameter 0,8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	Supply-star point	P
	Conductor cross-sectional area (mm <sup>2</sup> ):	50	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	3,5	P
	Test sequence of operation: O – t – CO		P
	Test circuit according figure: 9		P
	- test voltage U/U <sub>e</sub> = 1,05 (V) ..... L1: ..... L2:	440 440	P
	Short-circuit test current (I <sub>IT</sub> ): equal to 1,2 times the max. setting of the short-time delay release tripping current,		N/A
	or, in the absence of such a release, 1,2 time the max. setting of the tripping current of the instantaneous release,	I <sub>IT</sub> =1,50kA	P
	or, where relevant 1,2 times the max. setting of the definite time delay release tripping current, but not exceeding 50kA.		N/A
	- r.m.s. test current AC/DC: (A)	1,51kA	P
	power factor/time constant:	0,48	P
	- Factor "n"	1,7	P
	- peak test current (kA <sub>max</sub> ) :	2,66	P



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Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "O" L1		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1:	1,81	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1:	14,0	P
	Pause, t: (min)	3	P
	Test sequence "CO" L1		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L1:	1,95	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L1:	11,1	P
	Test sequence "O" L2		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L2:	1,80	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L2:	10,7	P
	Pause, t: (min)	3	P
	Test sequence "CO" L2		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L2:	1,81	P
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L2:	9,98	P
	Test sequence "O" L3		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L3:		N/A
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L3:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO" L3		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L3:		N/A
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L3:		N/A
	Test sequence "O" L4		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L4:		N/A
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L4:		N/A
	Test sequence "CO" L4		
	- max. let-through current: (kA <sub>peak</sub> ) ..... L4:		N/A
	- Joule integral I <sup>2</sup> dt (kA <sup>2</sup> s) ..... L4:		N/A
	For 4-pole circuit-breakers with a protected neutral pole, the test voltage for that pole shall be phase-to-phase voltage divided by $\sqrt{3}$ . This test is applicable only where the construction of the protected neutral pole differs from that of the phase poles.		N/A
	Test sequence "O" N		
	- max. let-through current: (kA <sub>peak</sub> ) ..... N:		N/A
	- Joule integral I <sup>2</sup> dt (A <sup>2</sup> s) ..... N:		N/A
	Pause, t: (min)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO" N		
	- max. let-through current: (kA <sub>peak</sub> ) ..... N:		N/A
	- Joule integral I <sup>2</sup> dt (A <sup>2</sup> s) ..... N:		N/A
	Melting of the fusible element		N/A
	Damage to insulation on conductors		N/A
	Holes in the PE-sheet for test sequence "O"		N/A
	Cracks observed		N/A
H.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P
H.4	Verification of overload releases		
	The operation of overload releases shall be verified at 2.5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	313A (Test at 30° C)	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... L4:	1min49s 2min516s - -	P
H.5	Marking		
	Circuit-breaker for which all values of rated voltage have not been tested according to this annex or are not covered by such testing, shall be identified by the symbol  which shall be marked on the circuit-breaker immediately following these values of rated voltage		N/A

<b>IEC 60947-2</b>			
Clause	Requirement + Test	Result - Remark	Verdict

Annex J	Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers		
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Annex L	Circuit-breakers not fulfilling the requirements for overcurrent protection		
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Annex M	Modular residual current devices (without integral current breaking device)		
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Annex N	Electromagnetic compatibility (EMC) – Additional requirements and test methods for devices not covered by Annexes B, F and M		
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Annex O	Instantaneous trip circuit-breakers (ICB)		
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Annex P	DC circuit-breakers for use in photovoltaic (PV) applications		
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IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

## Annex n° 1

ATTACHMENT TO TEST REPORT IEC 60947-2 COMPULSORY SPECIFICATION FOR CIRCUIT BREAKERS OF STANDARD VC 8036	
According to .....: VC8036 ED.3: 2015	

1	Scope		
1.1	This specification covers circuit breakers with moulded cases the main contacts of which are intended to be connected to circuits with rated voltages not exceeding 1000 Vac or 1500 Vdc, rated currents not exceeding 125A and a rated ultimate short circuit breaking capacity (Icu) not exceeding 10 kA.		
1.2	This specification does not cover circuit breakers incorporating residual current protection (earth leakage protection).		
2	Definition		
	For the purpose of this specification the following definition applies:		
	<b>Circuit breaker:</b> A mechanical switching device, capable of making, carrying and breaking currents under normal circuit conditions and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions such as a short circuit or an earth fault.		
3	Requirement		
3.1	A circuit breaker shall be safe and shall function safely and correctly during normal and abnormal circuit conditions.		
3.2	SANS 556-1 Low-voltage switchgear, Part 1- Circuit breakers as published in Government Notice 39 of 28 January 2005 (Government Gazette 27179).		
	Or alternatively, for the period up to 5 years from the date of final publication of this Compulsory Specification:		
3.3	SANS 60947-2 / IEC 60947-2: 1995, Low-voltage switchgear and controlgear – Part 2: Circuit-breakers, as published by Government Notice No. 411 of 27 March 1998, as modified in 3.4 and 3.5		
3.3.1	The power-frequency recovery voltage, as given in 8.3.2.2.6 and 8.3.3.4 (table 13) of the said SABS IEC 60947-2:1995, for a circuit-breaker with a maximum operational voltage of 220/380 V a.c. to 240/415 V a.c. (inclusive), shall be 252/440 V a.c.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

3.3.2							P
Table 11 — Values of power factor and time constant corresponding to test currents							
1	2	3	4	5	6	7	
Test current I kA	Power factor			Time constant ms			
	Short- circuit	Operational performance capability	Overload	Short-circuit	Operational performance capability	Overload	
I ≤10	0,45-0,5	0,8	0,45-0,5	5	2	2,5	

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**TABLE: temperature rise measurements**

temperature rise dT of part:		phase	dT (K)	required dT (K)
For clause 8.3.3.6 (I-1)				
1	Terminals for external connections	Max for all	67	80
2	Enclosure	Max for all	41	50
3	Installation surface	Max for all	40	60
4	Non-metallic handle	Max for all	31	35
temperature rise dT of part:		phase	dT (K)	required dT (K)
For clause 8.3.3.6 (I-2)				
1	Terminals for external connections	Max for all	71	80
2	Enclosure	Max for all	47	50
3	Installation surface	Max for all	43	60
4	Non-metallic handle	Max for all	26	35
temperature rise dT of part:		phase	dT (K)	required dT (K)
For clause 8.3.3.6 (I-3)				
1	Terminals for external connections	Max for all	66	80
2	Enclosure	Max for all	38	50
3	Installation surface	Max for all	40	60
4	Non-metallic handle	Max for all	13	35
temperature rise dT of part:		phase	dT (K)	required dT (K)
For clause 8.3.3.6 (I-4)				
1	Terminals for external connections	Max for all	63	80
2	Enclosure	Max for all	36	50
3	Installation surface	Max for all	38	60
4	Non-metallic handle	Max for all	9	35

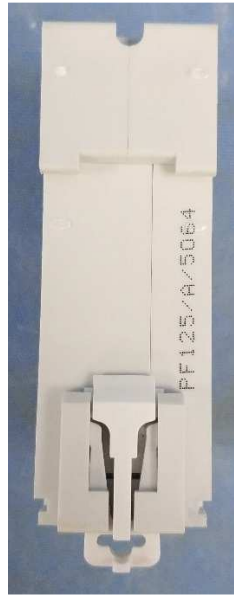
For clause 8.3.4.5 (II-1)				
1	Terminals for external connections	Max for all	68	80
For clause 8.3.4.5 (II-3)				
1	Terminals for external connections	Max for all	69	80
For clause 8.3.4.5 (II-5)				
1	Terminals for external connections	Max for all	67	80

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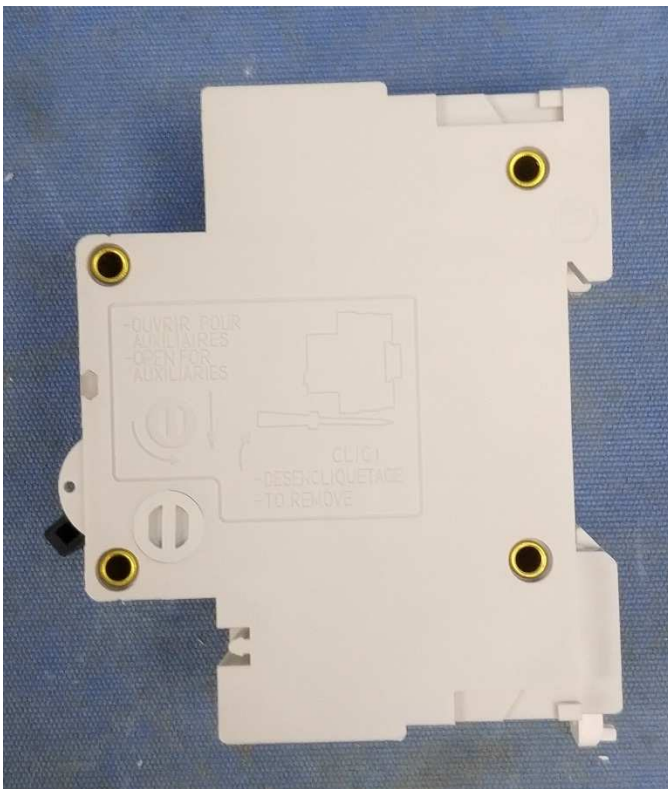
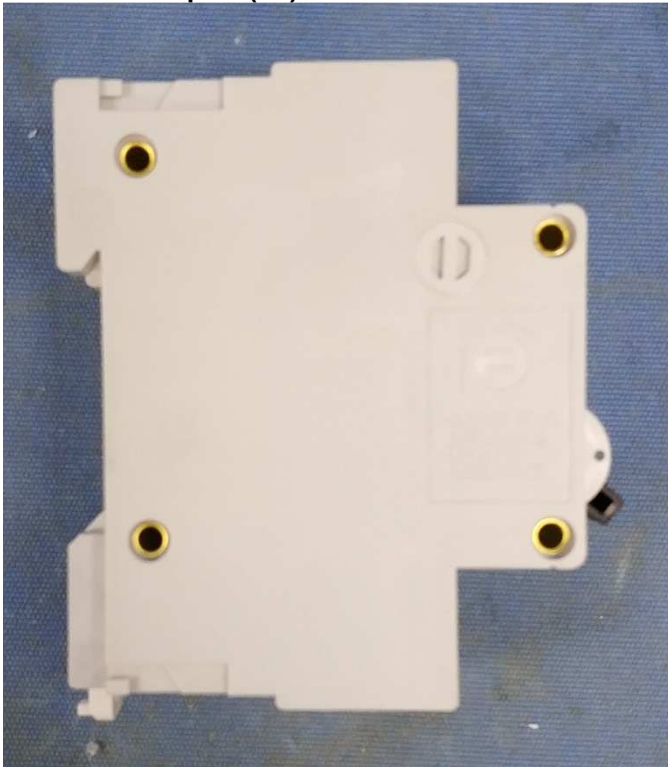
TABLE: Resistance to heat (Ball pressure test)						
no.	Specimen					Verdict
	Description	Colour	Temp. °C	Impress diam. mm	Result diam. mm	
1	Enclosure	White	125	2,0	1,1	P
2	Are-extinguishing chamber	Red	125	2,0	1,0	P
3	Non-metallic mechanical parts	Grey	125	2,0	1,2	P
4	Handle	Black	125	2,0	1,3	P

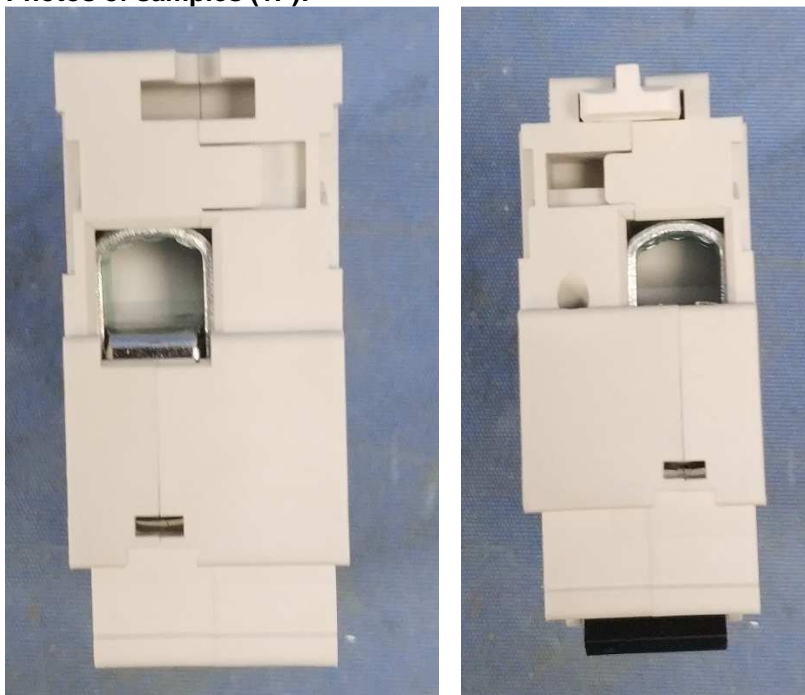
TABLE: Resistance to fire (Glow wire test)								
no.	Specimen							Verdict
	Description	Colour	Thick (mm)	Temp. °C	burning after t (s)	drops	support burning	
1	Enclosure	White	2,5	960	-	No	No	P
2	Are-extinguishing chamber	Red	2,5	650	-	No	No	P
3	Non-metallic mechanical parts	Grey	2,5	960	-	No	No	P
4	Handle	Black	2,5	650	-	No	No	P

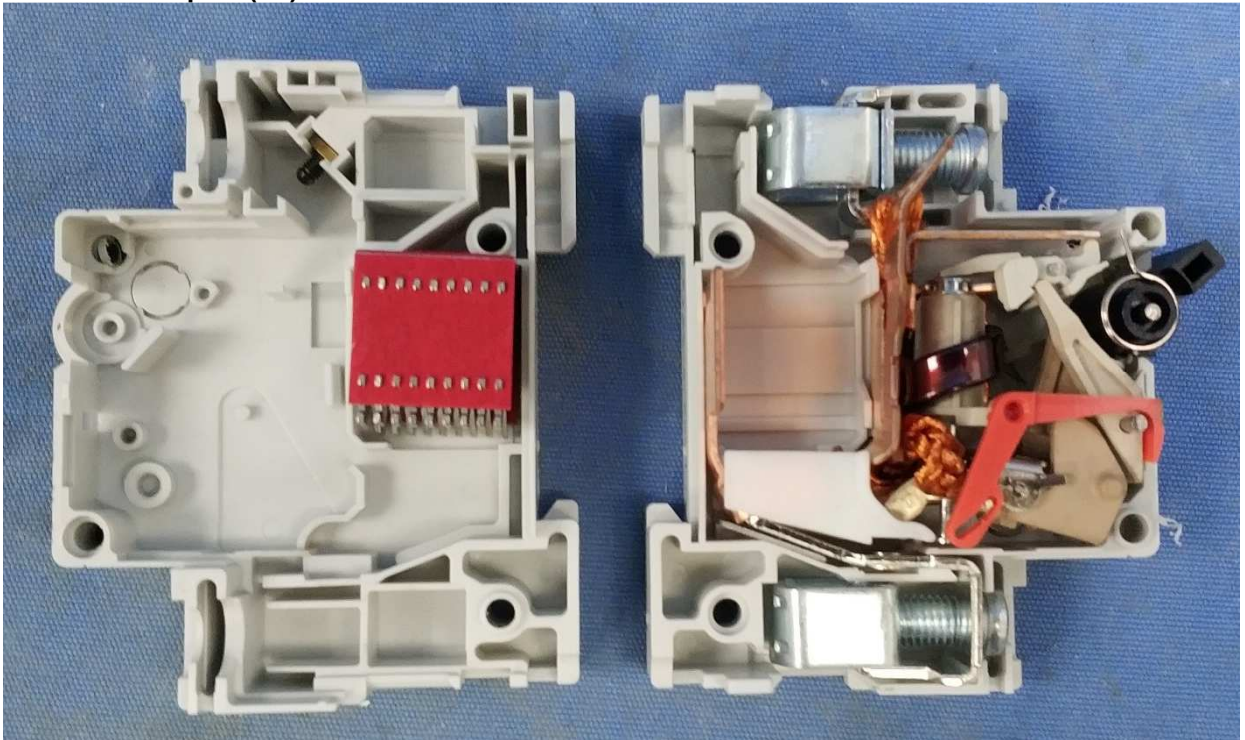
TABLE: Resistance to tracking (tracking test)								
no.	Specimen							Verdict
	Description	Colour	Drops (no.)	Voltage (V)	Burning	Current (A)	Result	
1	Enclosure	White	>50	175	-	-	No flashovers	P
2	Are-extinguishing chamber	Red	>50	175	-	-	No flashovers	P
3	Non-metallic mechanical parts	Grey	>50	175	-	-	No flashovers	P
4	Handle	Black	>50	175	-	-	No flashovers	P

**IEC 60947-2****Photos of samples (1P):**

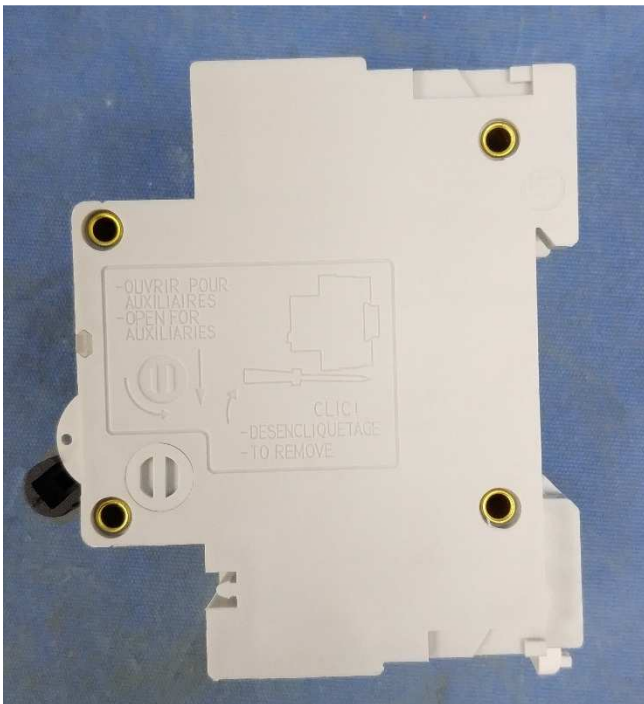


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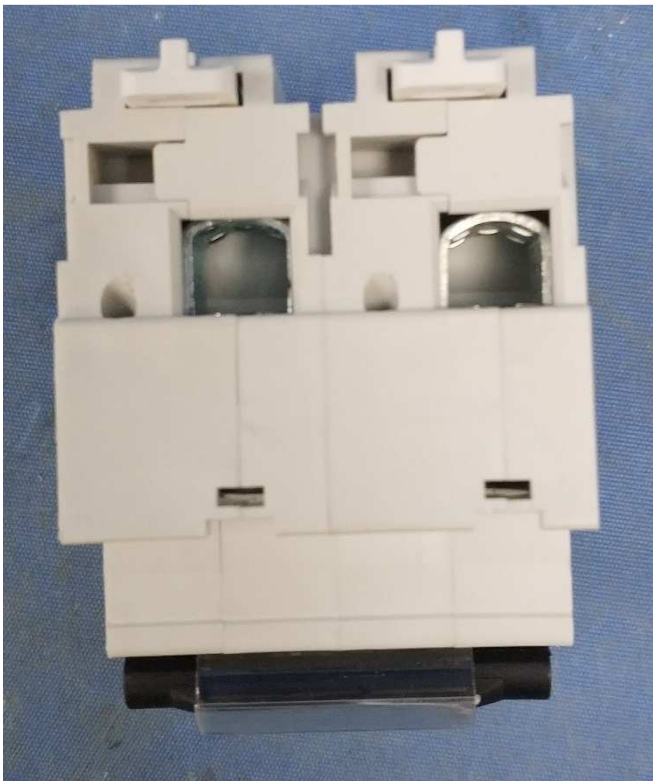
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**IEC 60947-2****Photos of samples (1P):**

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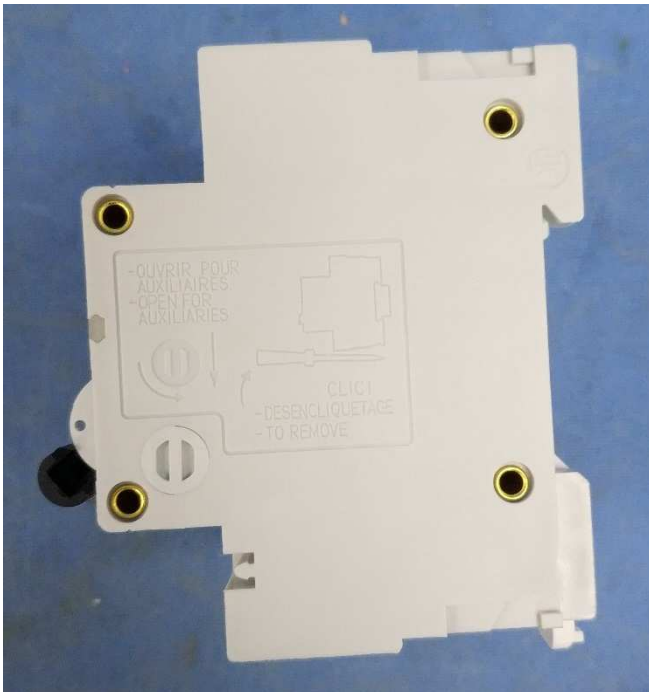
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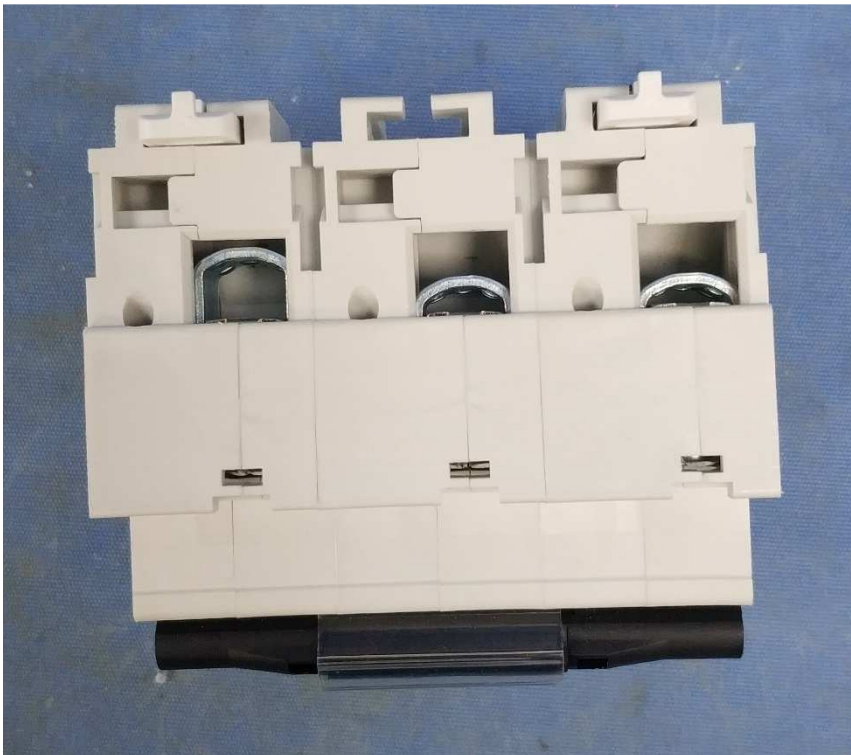
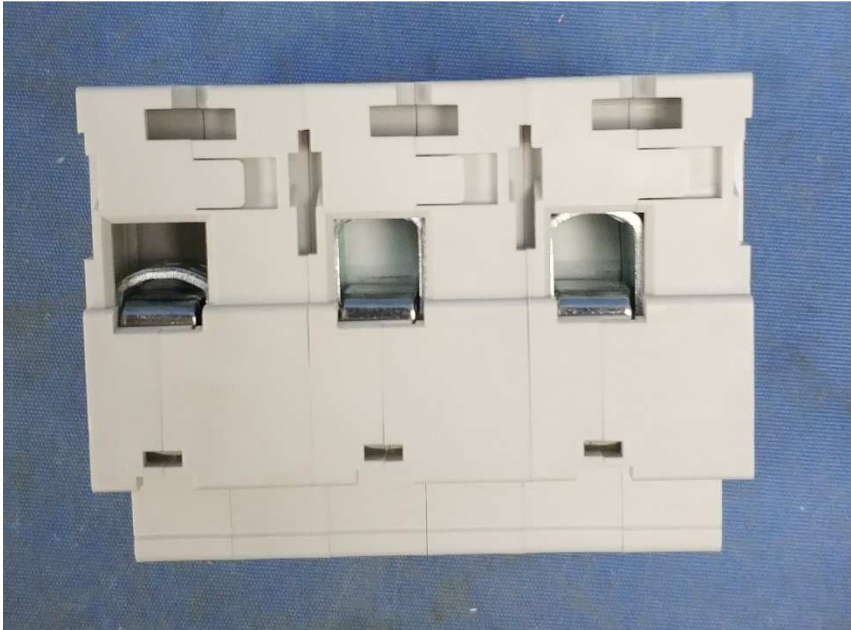
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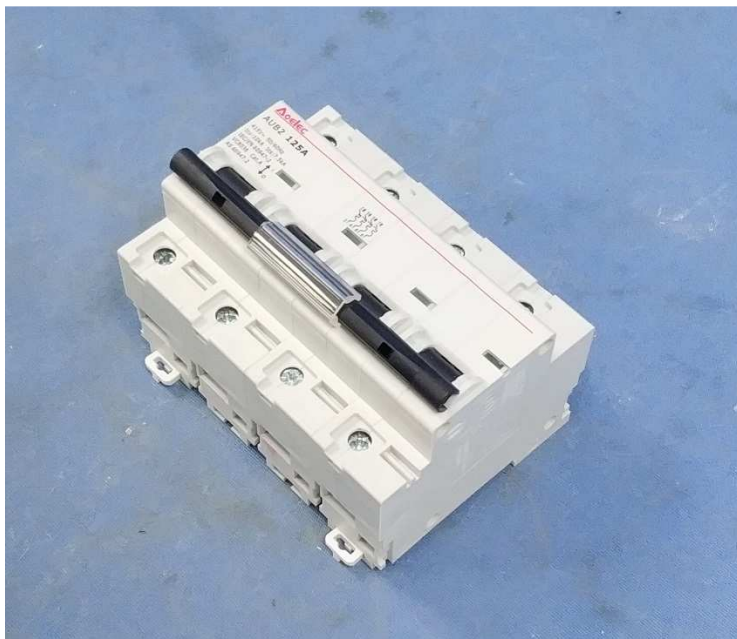
**Photos of samples (3P):**



**IEC 60947-2****Photos of samples (3P):**



**IEC 60947-2****Photos of samples (3P):**

**IEC 60947-2****Photos of samples (4P):**

**IEC 60947-2****Photos of samples (4P):**

**IEC 60947-2****Photos of samples (4P):**