Test Report issued under the responsibility of:

TEST REPORT
IEC 60947-2
Low-voltage switchgear and controlgear - Part 2: Circuit-breakers

Report Reference No. ..... :	130700019SHA-001
Date of issue ..... :	October 31, 2013
Total number of pages	125
CB Testing Laboratory ..... :	Intertek Testing Services Shanghai
Address ..... :	Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
Applicant's name ..... :	ELMARK INDUSTRIES SC
Address ..... :	2 Dobrudzha blvd., Dobrich, Bulgaria
Test specification:	
Standard ..... :	☒ IEC 60947-2:2006 (4th Edition) + A1:2009 +A2:2013 ☒ EN 60947-2:2006 + A1:2009 +A2:2013
Test procedure ..... :	CB+S
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60947_2F
Test Report Form(s) Originator ..... :	KEMA Quality BV
Master TRF ..... :	Dated 2010-01

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Test item description ..... :	Moulded case circuit-breakers
Trade Mark ..... :	ELMARK
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	DS 1
Ratings ..... :	Ue=415V~, 3P In=160~400A

Testing procedure and testing location:	
☒ **CB Testing Laboratory**:	Intertek Testing Services Shanghai
Testing location/ address.....:	Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
☒ **Associated CB Laboratory:**	Inspection Center of Products' Quality of Low Voltage Electric Apparatus in Zhejiang Province
Testing location/ address.....:	West Zhonghuan Road, Jiaxing City, Zhejiang Province, P.R.China
Tested by (name + signature).....:	Mathew Shen
Approved by (+ signature) .....:	Jim Hua
☐ Testing procedure: TMP	
Tested by (name + signature).....:	
Approved by (+ signature) .....:	
Testing location/ address.....:	
☐ Testing procedure: WMT	
Tested by (name + signature).....:	
Witnessed by (+ signature).....:	
Approved by (+ signature) .....:	
Testing location/ address.....:	
☐ Testing procedure: SMT	
Tested by (name + signature).....:	
Approved by (+ signature) .....:	
Supervised by (+ signature).....:	
Testing location/ address.....:	
☐ Testing procedure: RMT	
Tested by (name + signature).....:	
Approved by (+ signature) .....:	
Supervised by (+ signature).....:	
Testing location/ address.....:	

Summary of testing:

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

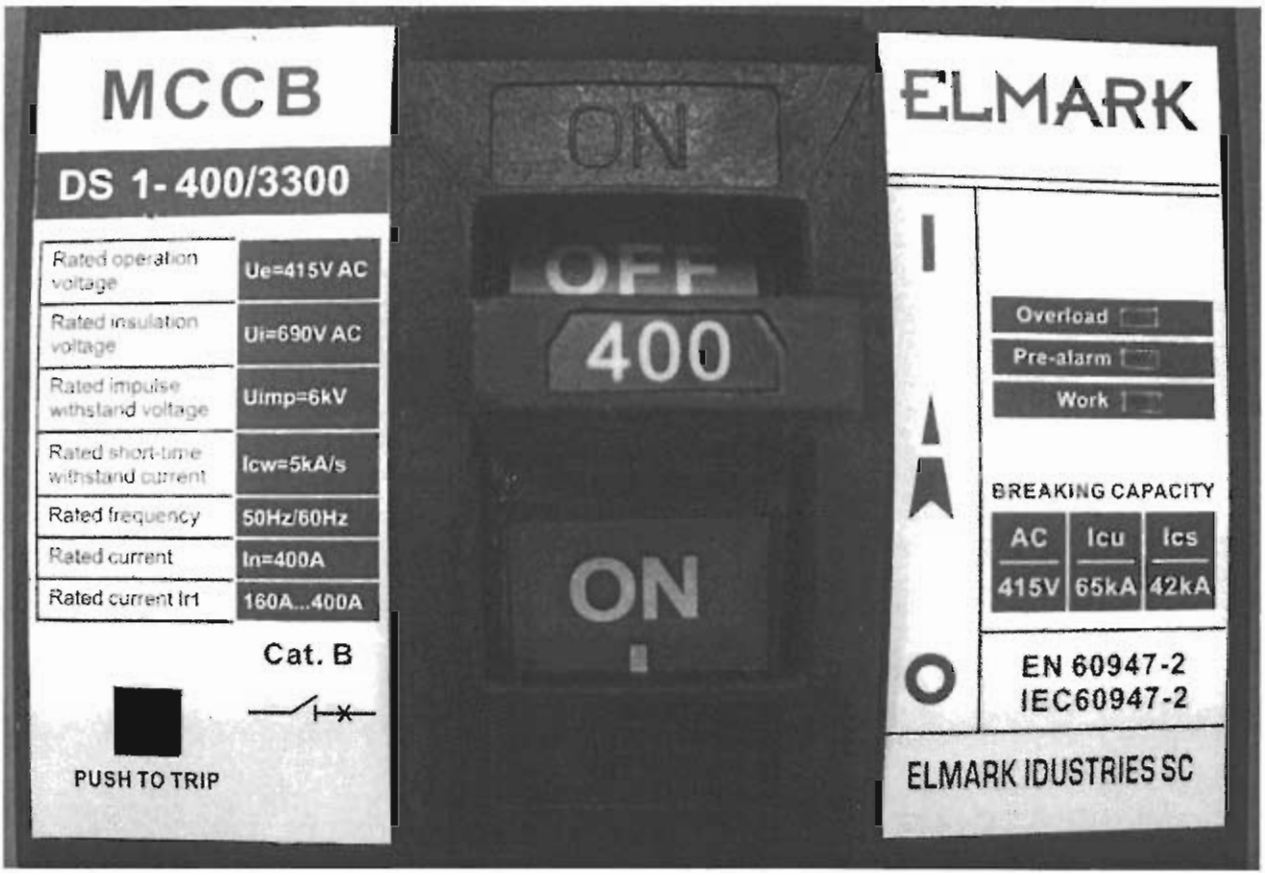
Model No.	No. of poles	In(A)	Test sequence and number of samples									
			I	II	III	IV	V	Combined	Annex B	Annex C	Annex F	Annex H
DS 1	**3P**	**400**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**	**1**

Tests performed (name of test and test clause):		**Testing location:**
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

Summary of compliance with National Differences:

N/A

Copy of marking plate



Test item particulars: test item vs. test requirements	
3. Classification	
3.1. Utilization category: (A or B). ..... :	B
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) ..... :	Independent manual
3.5. Suitability for insulation: (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: (IP code) ..... :	IP20
4.7. Type of release (thermo-magnetic / electronic) ..... :	Electronic
4.8. Integral fuses (integrally fused circuit-breakers) Type and characteristics of SCPD..... :	N/A
7.3 Electromagnetic compatibility (EMC) Environment A or B..... :	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: Ue (V)..... :	415~
- rated insulation voltage: Ui (V)..... :	690
- rated impulse withstand voltage: Uimp (kV)..... :	6
- rated operational current: Ie (A)..... :	160~400
- kind of current ..... :	AC
- conventional free air thermal current: Ith (A)..... :	160~400
- conventional enclosed thermal current: Ithe (A) ..... :	N/A
- current rating for four-pole circuit-breakers: (A) ..... :	N/A
- number of poles ..... :	3P
- rated frequency: (Hz) ..... :	50/60Hz
- integral fuses (rated values) ..... :	N/A
Rated duty :	
- eight-hour duty ..... :	N/A
- uninterrupted duty: Iu (A) ..... :	160~400
Short-circuit characteristic :	
rated short-time making capacity: Icm (kA)..... :	N/A

rated ultimate short-circuit breaking capacity: Icu (kA) . .....:	65kA
rated service short-circuit breaking capacity: Ics (kA).....:	42kA
rated short-time withstand current: Icw (kA/s).....:	5kA/1s
Control circuits :	
Electrical control circuits :	
- kind of current: (AC, DC) .....:	N/A
- rated frequency: (Hz) .....:	N/A
- rated control circuit voltage: Uc (nature, frequency, V) ....:	N/A
- rated control supply voltage: Us (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 Ue (V).....:	N/A
- rated insulation voltage: Ui (V).....:	N/A
- rated operational current: Ie (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: Iu (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	Yes
- independent of previous load	Yes
- dependent on previous load; (for example thermal type release)	N/A
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: Uc (nature, frequency, V)	N/A
- kind of current	N/A
- rated frequency: (if AC)	N/A
2) Over-current release	
- rated current	160~400A
- kind of current	AC
- rated frequency: (if AC)	50/60Hz
- current setting (or range of settings)	Inverse time delay: I_{r1}=160~400A Instantaneous: (4-14)I_{r1}
- time settings (or range of settings)	Inverse time delay: 1,05I_{r1}: ≥2h, 1,30I_{r1}<2h Instantaneous: 0,8x(4-14)I_{r1}: ≥0,2s, 1,2x(4-14)I_{r1}: <0,2s

Test item particulars.....:	
Classification of installation and use.....:	Installed by screw
Supply Connection.....:	N/A
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item.....:	July 01, 2013
Date (s) of performance of tests.....:	From July 01, 2013 to October 31, 2013

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

Throughout this report a comma ~~(point)~~ is used as the decimal separator.

Factory information: Same as applicant

General product information:

DS 1
Ue=415V(3P), Ui=690V, Uimp=6kV, 50/60Hz, Cat. B
In=160~400A
Icu=65kA, Ics=42kA, Icw=5kA/1s

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	MARKING		
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:	160~400A	P
	- suitability for isolation, if applicable, with the symbol 		P
	- indication of the open and closed position: with O and I respectively, if symbols are used	I ON and O OFF	P
b)	Marking on equipment not needed to be visible after mounting:		
	- manufacturer's name or trademark	ELMARK	P
	- type designation or serial number	DS 1	P
	- IEC 60947-2 if the manufacturer claims compliance with this standard.	EN60947-2	P
	- utilization category	B	P
	- rated operational voltage(s) Ue	415V~	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
	- value (or range) of the rated frequency and/or the indication DC (or symbol)	50/60Hz	P
	- rated service short-circuit breaking capacity. Ics	42kA	P
	- rated ultimate short-circuit breaking capacity. Icu	65kA	P
	- rated short-time withstand current, (Icw) and associated short-time delay, for utilization category B	5kA/1s	P
	- line and load terminals, unless their connection is immaterial		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
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 (Icm) (if higher than specified in 4.3.5.1)		N/A
	- rated insulation voltage. (Ui) if higher than the maximum rated operational voltage)	690V~	P
	- rated impulse withstand voltage (Uimp), when declared.	6kV	P
	- pollution degree if other than 3		N/A
	- conventional enclosed thermal current (Ithe) if different from the rated current:		N/A
	- IP Code, where applicable:		N/A
	- 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:		N/A
	- r.m.s sensing if applicable, according to F.4.1.1		N/A
	- suitability for environment A or B		N/A
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"	P
	- load terminal	"2, 4, 6"	P
	- neutral pole terminal "N"		N/A
	- protective earth terminal ⏚		N/A
	- terminal of coils (A/B)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
7.1	CONSTRUCTION		
7.1.1	Withdrawable circuit-breaker		N/A
	In the disconnected position (main- and auxiliary circuits)		
	Isolating distances for circuit-breaker suitable for isolating warranted:		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
	The isolating distances between the isolating contacts cannot be inadvertently reduced.		N/A
7.1.2.1 part 1	Resistance to abnormal heat and fire		P
7.1.3 part 1	Current-carrying parts and their connection		P
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:	6kV	
	- max. value of rated operational voltage to earth	-	
	- nominal voltage of supply system:	415V~	
	- overvoltage category:	III	
	- pollution degree:	3	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- field-in or homogeneous:	Field-in	
	- minimum clearances (mm):	5,5	
	- measured clearances (mm):	>8	P
	Creepage distances:		
	- rated insulation voltage Ui (V)	690	
	- pollution degree	3	
	- comparative tracking index (V)	175	
	- material group	IIIa	
	- minimum creepage distances (mm)	12,5	
	- measured creepage distances (mm)	>15	P
7.1.5 part 1	Actuator		
7.1.5.1 part 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 part 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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	- 60417-2-IEC-5007 O Off (power)	O	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 part 1	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
7.1.7	Additional safety requirements for equipment suitable for isolation		
7.1.7.1	Additional constructional requirements for equipment suitable for isolation (Ue > 50 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		N/A
	- visibility of the moving contacts		N/A
	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) :	5,5	
	- measured clearances (mm) :	>8	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test Uimp across gap (kV) :	9,8	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
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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.8	Terminals		
7.1.8.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength	Lug terminals to connect copper bar	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 :	Copper bar	P
	minimum cross-sectional area of conductor (mm^2) :		N/A
	maximum cross-sectional area of conductor (mm^2) :		N/A
	number of conductors simultaneously connectable to the terminal :		N/A
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
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", "2", "3", "4", "5", "6"	P
7.1.9 part 1	Additional requirements for equipment provided with a neutral pole		
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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, shall operate substantially together.		N/A
7.1.10	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
part 1	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 part 1	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		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The protective earth terminal shall be clearly and permanently identified by its marking		N/A
	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	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	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.	IP2X	
	Test for first numeral .....:	1 2 3 4 5 6	N/A P N/A N/A N/A N/A
	Test for second characteristic	IPXX	
	Test for second numeral .....:	1 2 3 4 5 6 7 8	N/A N/A N/A N/A N/A N/A N/A N/A
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
7.2	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
7.2.1.1.1	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

IEC 60947-2			
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
7.2.1.1.2	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
7.2.1.1.3	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
7.2.1.1.4	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
7.2.1.1.5	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	- 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. a part 1	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 part 1	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
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
7.2.1.5 part 1	Limits of operation of current operated relays and released		
	Limits of operation of current operated relays and releases shall be stated in the relevant product standard		N/A
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
	- I^2t 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 ± 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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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
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
8	TESTS		
8.2.4	Mechanical properties of terminals		
	Mechanical strength of terminals		
	maximum cross-sectional area of conductor (mm^2) :	Copper bar	
	diameter of thread (mm) :		
	torque (Nm) :		
	5 times on 2 separate clamping units		N/A
	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm^2) :		
	number of conductors of the smallest cross section :		
	diameter of bushing hole (mm) :		
	height between the equipment and the platen :		
	mass at the conductor(s) (kg) :		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	conductor of the largest cross-sectional area (mm²) :		
	number of conductors of the largest cross section :		
	diameter of bushing hole (mm) :		
	height between the equipment and the platen :		
	mass at the conductor(s) (kg) :		
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	conductor of the largest and smallest cross-sectional area (mm²) :		
	number of conductors of the smallest cross section, number of conductors of the largest cross section :		
	diameter of bushing hole (mm) :		
	height between the equipment and the platen :		
	mass at the conductor(s) (kg) :		
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
	Pull-out test		
	force (N) :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS - 1 sample: 3P, 400A, DS 1, I-1		
8.3.3.1	Tripping limits and characteristic		
8.3.3.1.2	Opening under short-circuit conditions		
	Manufacturer's name or trademark	ELMARK	
	Type designation or serial number	DS 1	
	Sample no:	I-1	
	Rated operational voltage: Ue (V)	415	
	Rated current: In (A)	400	
	Ambient temperature 10-40 °C :	30,6°C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	(4-14)I_{r1}	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
	Electromagnetic overcurrent releases		
	Test current: 80% of the rated~~, or **minimum** adjustable setting~~ current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		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 rated~~, or **minimum** adjustable setting~~ current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A

IEC 60947-2			
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 **maximum** adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		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 **maximum** adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:		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: L2: L3: N:		N/A
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	Electronic overcurrent releases		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For circuit-breakers with an electronic overcurrent release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		P
	Test current: 80% of the rated, or **minimum** adjustable setting current: (A)	I_{r1}=160A I_{test}=0,8x4I_{r1}=512A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 >0,2s >0,2s >0,2s -	P
	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 **minimum** adjustable setting current: (A)	I_{r1}=160A I_{test}=1,2x4I_{r1}=768A	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 39ms 33ms 38ms -	P
	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 **maximum** adjustable setting current: (A)	I_{r1}=400A I_{test}=0,8x14I_{r1}=4480A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 >0,2s >0,2s >0,2s -	P
	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 **maximum** adjustable setting current: (A)	I_{r1}=400A I_{test}=1,2x14I_{r1}=6720A	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 37ms 39ms 38ms -	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
8.3.3.1.3	Opening under overload conditions		
a)	Instantaneous or definite time-delay releases		
	Manufacturer's name or trademark		
	Type designation or serial number		
	Sample no:		
	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
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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		
	Manufacturer's name or trademark	ELMARK	
	Type designation or serial number	DS 1	
	Sample no:	I-1	
	Rated operational voltage: Ue (V)	415	
	Rated current: In (A)	400	
	For releases dependent of ambient air temperature: Reference temperature		N/A
	Test ambient temperature (°C)		N/A
	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		N/A
	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.		P
	Test ambient air temperature:	30,6°C	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Range of adjustable setting current: (A)	In	P
	Releases, dependent of ambient air temperature: Reference temperature (°C)		N/A
	Thermal Magnetic releases, independent of ambient air temperature: at 30°C		N/A
	Test current: 105% of the rated, or **minimum** adjustable setting current: (A)	168	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	>2h	P
	Test current: 130% of the rated, or **minimum** adjustable setting current: (A)	208	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: <1h when In < 63A, <2h when In > 63 A	5min27s	P
	Test current: 105% of the **maximum** adjustable setting current: (A)	420	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	>2h	P
	Test current: 130% of the **maximum** adjustable setting current: (A)	520	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: <1h when In < 63A, <2h when In > 63 A	6min56s	P
	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 **minimum** 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 **minimum** 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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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: <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)		N/A
	Releases, independent of ambient air temperature: at 30°C		N/A
	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
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1.4	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.		
	overload releases: (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
	short-circuit releases		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, overload releases: (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electromagnetic): (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electronic): (s) L1: 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, overload releases: (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electromagnetic): (s) L1-L2: L1-L3: L2-L3:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electronic): (s) L1: 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.		
	overload releases: (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
	short-circuit releases		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 **minimum** 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, overload releases: the circuit-breaker does not trip:		N/A
	Operating time, short-circuit releases (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, short-circuit releases (electronic), shall not trip: (s) L1: L2: L3:		N/A
	Test current: 1,5 times of **maximum** 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, overload releases: the circuit-breaker does not trip:		N/A
	Operating time, short-circuit releases (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, short-circuit releases (electronic), shall not trip: (s) L1: L2: L3:		N/A
8.3.3.2	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) :	6	P
	- sea level of the laboratory:	5m	P
	- test Uimp main circuits (kV) :	9,8	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) :	12,3	P
a)	Application of test voltage		

IEC 60947-2			
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: - 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
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) :	500	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
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
8.3.3.2	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 Ue, and shall not exceed 0,5mA.	457V L1: $16,7x10^{-3}$mA L2: $20,8x10^{-3}$mA L3: $18,3x10^{-3}$mA	P
8.3.3.3	Mechanical operation and operational performance capability		
8.3.3.3.2	Construction and mechanical operation		
a)	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.1		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.5, regarding the charge indicator and the direction of operation of manual energy storing		N/A
b)	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.3		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 7.2.1.5 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		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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
c)	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 8.3.3.6		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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
d)	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 °C ± 2 °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
8.3.3.3.3	Operational performance capability without current.		
	Type designation or serial number	DS 1	
	Sample no:	I-1	
	Rated current In (A)	400	
	Rated operational voltage: Ue (V)	415	
	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 :	25,3	P
	Number of operating cycles per hour	60	P
	Number of cycles without current (total) (closing mechanism energized at the rated Uc)		N/A
	Number of cycles without current (without releases)	4000	P
	Applied voltage: 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 Uc		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 Uc		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	10 cycles without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	Electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.3.4	Operational performance capability with current.		
	Rated current: In (A)	400	
	Maximum rated operational voltage: Ue (V)	415	
	Conductor cross-sectional area (mm^2) :	240	P
	Number of operating cycles per hour	60	P
	Number of cycles with current (total) (closing mechanism energized at the rated Uc)	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/Ue = 1,0 (V) .....L1: .....L2: L3:	418 418 418	P
	- test current I/Ie = 1,0 (A) .....L1: .....L2: L3:	403 403 403	P
	- power factor/~~time constant~~:	0,80	P
	- frequency: (Hz)	50	P
	- on-time (ms):	408	P
	- off-time (s):	30	P
	Electrical components do not exceed the value indicated in tab. 7.		P
8.3.3.3.5	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number	DS 1	
	Sample no:	I-1	
	Rated current In (A)	400	
	Rated operational voltage: Ue (V)	415	
	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 :	22,8	P
	Number of operating cycles per hour	60	P
	Maximum rated operational voltage: Ue (V)	415	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:		P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	438 438 438	P
	- test current AC~~/DC~~: I/Ie = 6,0~~/2,5~~ (A) .....L1: .....L2: L3:	 2,41 2,41 2,41	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
	- frequency: (Hz)	50	P
	- on-time max 2s:	<2s	P
8.3.3.5	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000V	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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 Ue, and shall not exceed 2 mA.	457V L1:20,8x10^{-3}mA L2:27,6x10^{-3}mA L3:23,4x10^{-3}mA	P
8.3.3.6	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) :	Max. 68K	P
	conductor cross-sectional area (mm²) :	240	P
	test current Ie (A) :	400	P
8.3.3.7	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	580	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	1min27s	P
8.3.3.8	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 -		P
	and shall operate at 35% of the maximum control supply voltage.		P
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.		P
8.3.3.9	Verification of the main contact position for circuit-breakers for isolation		
	actuating force for opening (N) ..... :	93	P
	test force with blocked main contacts for 10 s (N) . :	279	P
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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: 3P, 400A, DS 1, II-1		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	DS 1	
	Sample no:	II-1	
	Rated current: In (A)	400	
	Rated operational voltage: Ue (V)	415	
	Rated service short-circuit breaking capacity: (kA)	42	
	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^2	25	P
	- finish: bare or conductive plating	Bare	P

IEC 60947-2			
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 (mm²) :	240	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	10,0	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Ue = 1,05 (V).....L1: .....L2: L3:	438 438 438	P
	- r.m.s. test current AC/~~DC~~: (kA) .....L1: .....L2: L3:	 42,6 42,6 42,6	P
	power factor/time constant :	0,23	P
	- Factor "n"	2,1	P
	- peak test current (kA) :	88,2	P
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	33,8 33,7 27,8	P
	- Joule integral I²dt (MA²s) .....L1: .....L2: L3:	5,67 3,70 2,33	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	30,0 39,5 27,2	P
	- Joule integral I²dt (MA²s) .....L1: .....L2: L3:	4,27 6,78 3,27	P
	Pause, t: (min)	3	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	35,5 37,7 32,2	P
	- Joule integral I^2dt (MA^2s) .....L1: .....L2: L3:	7,55 6,93 5,14	P
	Melting of the fusible element	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.4.2	Operational performance capability with current.		
	Rated current: In (A)	400	
	Maximum rated operational voltage: Ue (V)	415	
	Conductor cross-sectional area (mm^2) :	240	
	Number of operating cycles per hour	60	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated Uc)	50	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/Ue = 1,0 (V) .....L1: .....L2: L3:	419 419 419	P
	- test current I/Ie = 1,0 (A) .....L1: .....L2: L3:	403 403 403	P
	- power factor/time constant:	0,81	P
	- frequency: (Hz)	50	P
	- on-time (ms):	405	P
	- off-time (s):	30	P
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	P
	- no breakdown or flashover		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	457V Max.39,1x10^{-3}mA	P
8.3.4.4	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) :	Max.67K	P
	conductor cross-sectional area (mm²) :	240	P
	test current Ie (A) :	400	P
8.3.4.5	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	580	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	1min26s	P
8.3.4	TEST SEQUENCE II/III (Ics=Icu):		
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number		
	Sample no:		
	Rated current: In (A)		
	Rated operational voltage: Ue (V)		
	Rated service short-circuit breaking capacity: (kA)		
	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.		N/A
	Test made in free air:		N/A
	Distances of the metallic screen's: (all sides)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		N/A
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		N/A
	- size of hole: <30mm^2		N/A
	- finish: bare or conductive plating		N/A
	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		N/A
	Circuit is earthed at: (load-star- or supply-star point)		N/A
	Conductor cross-sectional area (mm²) :		N/A
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)		N/A
8.3.5.1	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:		N/A
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	- - - -	N/A
8.3.4.1	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		N/A
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	- - -	N/A
	- r.m.s. test current AC/DC: (A) .....L1: .....L2: L3:	- - -	N/A
	power factor/time constant :		N/A
	- Factor "n"		N/A
	- peak test current (A) :		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	- - -	N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	- - -	N/A
	Pause, t: (min)		N/A
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	- - -	N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	- - -	N/A
	Pause, t: (min)		N/A
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	- - -	N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:	- - -	N/A
	Melting of the fusible element		N/A
	Holes in the PE-sheet for test sequence "O"		N/A
	Cracks observed		N/A
8.3.4.2	Operational performance capability with current.		
	Rated current: In (A)		
	Maximum rated operational voltage: Ue (V)		
	Conductor cross-sectional area (mm^2) :		
	Number of operating cycles per hour		N/A
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated Uc)		N/A
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,0 (V) .....L1: .....L2: L3:		N/A
	- test current I/Ie = 1,0 (A) .....L1: .....L2: L3:		N/A
	- power factor/time constant:		N/A
	- frequency: (Hz)		N/A
	- on-time (ms):		N/A
	- off-time (s):		N/A
8.3.4.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V		N/A
	- no breakdown or flashover		N/A
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1,1 Ue)		N/A
8.3.4.4	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. ≤ 80 K (K) :		N/A
	conductor cross-sectional area (mm²) :		N/A
	test current Ie (A) :		N/A
8.3.4.5	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: <1h when In < 63A, <2h when In > 63 A		N/A
8.3.5.4	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:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	- - - -	N/A
8.3.5	TEST SEQUENCE III (Icu) - 1 sample: 3P, 400A, DS 1, III-1		
	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	DS 1	
	Sample no:	III-1	
	Rated current: In (A)	400	
	Rated operational voltage: Ue (V)	415	
	Rated ultimate short-circuit breaking capacity: (kA)	65	
	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		
8.3.5.1	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:		N/A
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	2min36s 2min41s 2min39s -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	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 Botton: 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	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 (mm²) :	240	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	10,0	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	438 438 438	P
	- r.m.s. test current AC/~~DC~~: (kA) .....L1: .....L2: L3:	65,4 65,4 65,4	P
	power factor/time constant :	0,18	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Factor "n"	2,2	P
	- peak test current (kAmax) :	143	P
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	38,2 40,9 34,5	P
	- Joule integral I^2dt (MA^2s) .....L1: .....L2: L3:	8,28 5,45 4,55	P
	Pause, t: (min)	3	P
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	42,9 34,8 34,2	P
	- Joule integral I^2dt (MA^2s) .....L1: .....L2: L3:	10,3 3,76 5,08	P
	Melting of the fusible element	No	P
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
8.3.5.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	457V Max.52,6x10^{-3}mA	P
8.3.5.4	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:		N/A
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	2min03s 1min57s 2min06s -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV - 1 sample: 3P, 400A, DS 1, IV-1		
	Rated short-time withstand current		
	Except where the combined test sequence applies, this test sequence applies to circuit-breakers of utilization category B and to those circuit-breaker of category A covered by note 3 of table 4, and comprises the following tests:		
	Where integrally fused circuit-breaker are of utilization category B, they shall meet the requirements of this sequence.		
	Type designation or serial number	DS 1	
	Sample no:	IV-1	
	Rated current: In (A)	400	
	Rated operational voltage: Ue (V)	415	
	Rated short-time withstand current: (kA/s)	5kA/1s	
	Rated frequency: (Hz)	50/60Hz	
8.3.6.1	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:	<10min	P
	- Operation time: (s) .....L1: .....L2: .....L3: .....N :	2min40s 2min36s 2min37s -	P
8.3.6.2	Test of rated short-time withstand current.		
	For this test, any over-current release, including the instantaneous override, if any, likely to operate during the test, shall be rendered inoperative.		
	- test frequency: (Hz)	50	P
	- duration of the test: (s)	1	P
	- test frequency: (Hz)	50	P
	- power factor / ~~time constant (ms)~~:	0,70	P
	- factor "n"	1,5	P
	- test voltage: (V) .....L1: .....L2: L3:	438 438 438	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current: (kA) .....L1: .....L2: L3:	5,06 5,06 5,06	P
	- highest peak current: (kA)	7,5	P
8.3.6.3	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) :	Max.70K	P
	conductor cross-sectional area (mm²) :	240	P
	test current Ie (A) :	400	P
8.3.6.4	Test of short-circuit breaking capacity at the max. short-time withstand current.		
	Rated short-time withstand current: (kA/s)		
	Test sequence: O – t – CO		
	max. available time setting of the short–time delay short-circuit release. (s)	0,4	P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	438 438 438	P
	- r.m.s. test current AC/~~DC~~: (A) .....L1: .....L2: L3:	 5,06 5,06 5,06	P
	- test frequency: (Hz)	50	P
	- power factor /~~time constant (ms)~~:	0,68	P
	- factor "n"	1,5	P
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	7,14 7,13 7,16	P
	- Joule integral I²dt (MA²s) .....L1: .....L2: L3:	10,6 10,6 10,8	P
	Pause, t: (min)	3	P
	- the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short–time delay short-circuit release and -		P
	- the instantaneous override, if any, shall not operate.		P
	-pause: t (min)	3	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	7,15 7,16 7,16	P
	- Joule integral I^2dt (MA^2s) .....L1: .....L2: L3:	10,9 10,9 11,0	P
	Pause, t: (min)	3	P
	- the circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short–time delay short-circuit release and -		P
	- the instantaneous override, if any, shall not operate.		P
	- if the circuit-breaker has a making current release, this requirement does not apply to the CO operation, if the prospective current exceeds the pre-determined value, since it will then operate.		N/A
8.3.6.5	Verification of dielectric withstand		P
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000V	
	- 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 Ue, and shall not exceed 2 mA.	457V $42,3x10^{-3}$mA (maximum)	P
8.3.6.6	Verification of overload releases		P
	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 maximum value stated by the manufacturer for twice the value of the current setting, at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:		
	- Operation time: (s) .....L1: .....L2: .....L3: .....N :	2min07s 2min01s 2min03s -	P

8.3.7	TEST SEQUENCE V		
	Performance of integrally fused circuit-breakers		
	STAGE 1		
	Type designation or serial number		
	Sample no:		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated current: In (A)		
	Rated operational voltage: Ue (V)		
	Value of prospective current equal to the selectivity limit current, as declared by the manufacturer. (kA)		
	Type of integrated fuses (all details)		
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		
8.3.7.1	Short-circuit at the selectivity limit current		
	Test sequences "O"		
	Fuses shall be fitted		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		
	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.		N/A
	Test made in free air:		N/A
	Distances of the metallic screen's: (all sides)		N/A
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		N/A
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		N/A
	- size of hole: <30mm^2		N/A
	- finish: bare or conductive plating		N/A
	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		N/A
	Circuit is earthed at: (load-star- or supply-star point)		N/A
	Conductor cross-sectional area (mm^2) :		N/A
	If terminals unmarked: line connected at: (underside/upside)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Tightening torques: (Nm)		N/A
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:		N/A
	- r.m.s. test current AC/DC: (A) .....L1: .....L2: L3:		N/A
	power factor/time constant :		N/A
	- factor "n"		N/A
	- peak test current (Amax) :		N/A
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:		N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:		N/A
	- fuses shall still intact .....L1: .....L2: L3:		N/A
8.3.7.2	Verification of temperature-rise		N/A
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. ≤ 80 K (K) :		N/A
	conductor cross-sectional area (mm^2) :		N/A
	test current Ie (A) :		N/A
8.3.7.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V		N/A
	- no breakdown or flashover		N/A
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1,1 Ue)		N/A

	STAGE 2		
	Type designation or serial number		
	Sample no:		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated current: In (A)		
	Rated operational voltage: Ue (V)		
	1.1 time the value of prospective current equal to the selectivity limit current, as declared by the manufacturer. (kA)		
	Type of integrated fuses (all details)		
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		
8.3.7.4	Verification of overload releases		N/A
	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:		
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :		N/A
8.3.7.5	Short-circuit at 1,1 times the take-over current		
8.3.7.1	Short-circuit at the selectivity limit current		
	Test sequences "O"		
	Fuses shall be fitted		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		
	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.		N/A
	Test made in free air:		N/A
	Distances of the metallic screen's: (all sides)		N/A
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		N/A
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- size of hole: <30mm^2		N/A
	- finish: bare or conductive plating		N/A
	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		N/A
	Circuit is earthed at: (load-star- or supply-star point)		N/A
	Conductor cross-sectional area (mm²) :		N/A
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)		N/A
	1.1 time the value of prospective current equal to the selectivity limit current, as declared by the manufacturer. (kA)		
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:		N/A
	- r.m.s. test current AC/DC: (A) .....L1: .....L2: L3:		N/A
	power factor/time constant :		N/A
	- factor "n"		N/A
	- peak test current (Amax) :		N/A
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:		N/A
	- Joule integral I²dt (A²s) .....L1: .....L2: L3:		N/A
	- at least two of the fuses shall have blown .....L1: .....L2: L3:		N/A
8.3.7.6	Short-circuit at rated ultimate short-circuit breaking capacity		
	Type designation or serial number		
	Sample no:		
	Rated current: In (A)		
	Rated operational voltage: Ue (V)		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated ultimate short-circuit breaking capacity. (kA)		
	Type of integrated fuses (all details)		
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (V)		
	Test sequences: O – t – CO		
	Fuses shall be fitted		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		
	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.		N/A
	Test made in free air:		N/A
	Distances of the metallic screen's: (all sides)		N/A
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		N/A
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		N/A
	- size of hole: <30mm^2		N/A
	- finish: bare or conductive plating		N/A
	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		N/A
	Circuit is earthed at: (load-star- or supply-star point)		N/A
	Conductor cross-sectional area (mm²) :		N/A
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)		N/A
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) .....L1: .....L2: L3:		N/A
	power factor/time constant :		N/A
	- factor "n"		N/A
	- peak test current (A) :		N/A
	Test sequence "O"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:		N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:		N/A
	Pause: t (s)		N/A
	new fitted fuses		N/A
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:		N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:		N/A
8.3.7.7	Verification of dielectric withstand		
	- equal twice time rated operational voltage with a minimum of 1000 V (new fuses fitted)		N/A
	- no breakdown or flashover		N/A
	- the leaking current for circuit-breaker suitable for isolation: (< 6mA / 1,1 Ue)		N/A
8.3.7.8	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:		
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.8	TEST SEQUENCE VI: Combined test sequence		
	At the discretion of, or in agreement with the manufacturer, this sequence may be applied to circuit-breaker of utilization cat. B:		
	Type designation or serial number		N/A
	Sample no:		N/A
	Rated current: In (A)		N/A
	Rated operational voltage: Ue (V)		N/A
	Rated short-time withstand current: (kA/s)		N/A
	Rated frequency: (Hz)		N/A
8.3.8.1	Verification of overload releases		
	The operation of overload releases shall be verified twice 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:		
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :		N/A
8.3.8.2	Test of rated short-time withstand current.		
	For this test, any over-current release, including the instantaneous override, if any, likely to operate during the test, shall be rendered inoperative.		
	- test frequency: (Hz)		N/A
	- duration of the test: (s)		N/A
	- test frequency: (Hz)		N/A
	- power factor / time constant (ms):		N/A
	- factor "n"		N/A
	- test voltage: (V) .....L1: .....L2: L3:		N/A
	- r.m.s. test current: (kA) .....L1: .....L2: L3:		N/A
	- highest peak current: (kA)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.8.3	Test of rated service short-circuit breaking capacity		
	At the highest voltage applicable to the rated short-time current.		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number		
	Sample no:		
	Rated current: In (A)		
	Rated operational voltage: Ue (V)		
	Rated service short-circuit breaking capacity: (kA)		
	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.		
	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.		N/A
	Test made in free air:		N/A
	Distances of the metallic screen's: (all sides)		N/A
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		N/A
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		N/A
	- size of hole: <30mm^2		N/A
	- finish: bare or conductive plating		N/A
	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		N/A
	Circuit is earthed at: (load-star- or supply-star point)		N/A
	Conductor cross-sectional area (mm²) :		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)		N/A
	Test sequence of operation: O – t – CO – t – CO		N/A
	The highest voltage applicable to the rated short-time current.		N/A
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:		N/A
	- r.m.s. test current AC/DC: (A) .....L1: .....L2: L3:		N/A
	power factor/time constant :		N/A
	- Factor "n"		N/A
	- peak test current (A) :		N/A
	Test sequence "O"		
	- max. let-through current: (kApeak .....L1: .....L2: L3:		N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:		N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO"		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:		N/A
	- Joule integral I^2dt (A^2s) .....L1: .....L2: L3:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The circuit-breaker shall remain closed for the short-time corresponding to the max. available time setting of the short-time delay short-circuit release.		N/A
	During this test the instantaneous override shall not operate		N/A
	- and the making current release shall operate		N/A
8.3.8.4	Operational performance capability with current.		
	Rated current: In (A)		N/A
	Maximum rated operational voltage: Ue (V)		N/A
	Conductor cross-sectional area (mm^2) :		N/A
	Number of operating cycles per hour		N/A
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated Uc)		N/A
	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:		N/A
	- test voltage U/Ue = 1,0 (V).....L1: .....L2: L3:		N/A
	- test current I/Ie = 1,0 (A).....L1: .....L2: L3:		N/A
	- power factor/time constant:		N/A
	- frequency: (Hz)		N/A
	- on-time (ms):		N/A
	- off-time (s):		N/A
8.3.8.5	Verification of dielectric withstand		N/A
	- equal to twice the rated operational voltage with a minimum of 1000 V		
	- no breakdown or flashover		N/A
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1,1 Ue)		N/A
8.3.8.6	Verification of temperature-rise		
	- the values of temperature-rise do not exceed the those specified in tab. 7.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature rise of main circuit terminals. ≤ 80 K (K) :		N/A
	conductor cross-sectional area (mm²) :		N/A
	test current Ie (A) :		N/A
8.3.8.7	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: <1h when In < 63A, <2h when In > 63 A		N/A
	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:		
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
Annex B	Circuit-breakers incorporating residual current protection		
B.3	Classification		
B.3.1	Classification according to the method of operation of the residual current function		
B.3.1.1	CBR functionally independent of line voltage		
B.3.1.2	CBR functionally dependent on line voltage		
B.3.1.2.1	Opening automatically in the case of failure of the line voltage with or without delay.		
B.3.1.2.2	Not opening automatically in the case of failure of line voltage.		
B.3.2	Classification according to the possibility of adjusting the residual operating current		
B.3.2.1	CBR with single rated residual operating current		
B.3.2.2	CBR with multiple settings of residual operating current	Fixed steps/continuous	
B.3.3	Classification according to time-delay of the residual current function		
B.3.3.1	CBR without time-delay: non-time-delayed type		
B.3.3.2	CBR with time-delay: time-delayed type		
B.3.3.2.1	CBR with non-adjustable time-delay		
B.3.3.2.2	CBR with adjustable time-delay	Fixed steps/continuous	
B.3.4	Classification according to behaviour in presence of a d.c. component	CBR of type AC / type A	
B.4	Characteristics of CBRs concerning their residual current function		
B.4.1.1	Rated residual operating current ($I\Delta n$)		
B.4.1.2	Rated residual non-operating current ($I\Delta no$)		
B.4.1.3	Rated residual short-circuit making and breaking capacity ($I\Delta m$)		
B.4.2	Preferred and limiting values		
	Preferred values of the rated residual operating current ($I\Delta n$)		
	Limiting value of the non-operating overcurrent in the case of a single-phase load in a multiphase circuit		
B.4.2.4	Operating characteristics		
	The value of the rated voltage of the voltage source of CBRs		
	For a time-delay type, the limiting non-actuating time is defined at 2 $I\Delta n$ and shall be declared by the manufacturer.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For CBR's having a limiting non-actuating time higher than 0,06 s, the manufacturer shall declare the maximum break time at $I\Delta n$, 2 $I\Delta n$, 5 $I\Delta n$, and 10 $I\Delta n$.		N/A
	In the case of a CBR having an inverse current/time characteristic, the manufacturer shall state the residual current/break time characteristic.		N/A
B.4.3	Value of the rated residual short-circuit making and breaking capacity ($I\Delta m$)		
	The minimum value of $I\Delta m$ is 25 % of I_{cu}.		N/A
B.5.	Marking		N/A
	Data according B.5. section a) shall be marked on integral CBRs (see B.1.1), in addition to the marking specified in 5.2, and be clearly visible in the installed position		N/A
	Data according B.5. section b) shall be marked on r.c. units and be clearly visible in the installed Position		N/A
	Data according B.5. section c) shall be marked on r.c. units and be visible after assembly with the circuit-breaker:		N/A
	Data according B.5.section d) shall be marked on integral CBRs or r.c. units, as applicable, or made available in the manufacturer's literature:		N/A
	Data according section B.5. section e) shall be made available in the manufacturer's literature:		N/A
B.8.	Tests		N/A
	This clause specifies tests for CBRs having a rated residual operating current $I\Delta n$ up to and including 30 A.		
	The applicability of the tests specified in this clause when $I\Delta n$ > 30 A is subject to agreement between manufacturer and user.		
	The instruments for the measurement of the residual current shall be at least class 0,5 (see IEC 60051) and shall show (or permit to determine) the true r.m.s. value.		N/A
	The instruments for the measurement of time shall have a relative error not greater than 10 % of the measured value.		N/A
B.8.1.1	Tests to be made during the test sequences of clause 8		N/A
B.8.1.1.1	Operational performance capability		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	During the operating cycles with current a third of the breaking operations shall be performed by actuating the test device, and a further third by applying a residual current of value IΔn (or, if applicable, of the lowest setting of the residual operating current) to any one pole.		N/A
	In the case of a reset-CBR, it is not possible to reclose the CBR after tripping without the intentional resetting action. This verification shall take place at the beginning and at the end of the operational performance capability test with current		N/A
	No failure to trip shall be admitted.		N/A
B.8.1.1.2	Verification of the withstand capability to short-circuit currents		
B.8.1.1.2.1	Rated service short-circuit breaking capacity (test sequence II)		
	Following the tests of 8.3.4, verification of the correct operation of the CBR in case of residual current shall be performed in accordance with B.8.2.4.1.		
B.8.2.4.1	Verification of operating in case of steady increase of the residual current (figure B.1)		
	Increase the residual current from 0,2 IΔn to IΔn in 30 sec. Required: value between IΔno and IΔn		N/A
	Min. setting IΔn.(mA): Interm. setting IΔn.(mA): Max. setting IΔn.(mA):		N/A
B.8.1.1.2.2	Rated ultimate short-circuit breaking capacity (test sequence III)		
	The correct operation of the overload releases of 8.3.5.1 and 8.3.5.4 by two-pole tests, on all possible combinations of phase poles in turn		N/A
	Following the tests of 8.3.5, verification of the correct operation of the CBR shall be performed in accordance with B.8.2.4.3.		N/A
B.8.2.4.3	Verification of operating in case of a sudden appearance of the residual current (figure B.1)		N/A
	A residual current is sudden appear on the CBR of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
B.8.1.1.2.3	Rated short-time withstand current (test sequence IV or test sequence VI (combined)		
	a) Behaviour during rated short-time withstand current test No tripping shall occur during the test of 8.3.6.2 or 8.3.8.2, as applicable.		N/A
	b) Verification of overload releases test sequence IV For the purpose of verifying the correct operation of the overload releases in accordance with 8.3.6.1 and 8.3.6.6, the single pole tests specified in 8.3.5.1 shall be replaced by two-pole tests, made on all possible combinations of phase poles in turn.		N/A
	b) Verification of overload releases for combined test sequence. For the purpose of verifying the correct operation of the overload releases in accordance with 8.3.8.1, the single pole test specified in 8.3.5.1 shall be replaced by two-pole tests made on all possible combinations of phase poles in turn.		N/A
	b) For the purpose of verifying the correct operation of overload releases in accordance with 8.3.8.6, the test specified in 8.3.3.7 shall be made using a three-phase supply.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	c) Verification of the residual current tripping device Following the tests of 8.3.6 or 8.3.8, as applicable, verification of the residual current tripping device shall be performed in accordance with B.8.2.4.3.		N/A
B.8.2.4.3	Verification of operating in case of a sudden appearance of the residual current (figure B.1)		N/A
	A residual current is sudden appear on the CBR of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
B.8.1.1.2.4	Integrally fused circuit-breakers (test sequence V)		
	For the purpose of verifying the correct operation of the overload releases, the single-pole tests specified in 8.3.7.4 and 8.3.7.8 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn, the test conditions being as specified in 8.3.7.4 and 8.3.7.8 but applicable to two poles.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Following the tests of 8.3.7, verification of the correct operation of the CBR shall be performed in accordance with B.8.2.4.3.		N/A
B.8.2.4.3	Verification of operating in case of a sudden appearance of the residual current (figure B.1)		N/A
	A residual current is sudden appear on the CBR of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
B.8.1.1.2.5	Test sequence VI (combined)		N/A
	Following the tests of 8.3.8, verification of the correct operation of the CBR shall be performed in accordance with B.8.2.4.3.		N/A
B.8.2.4.3	Verification of operating in case of a sudden appearance of the residual current (figure B.1)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A residual current is sudden appear on the CBR of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
B I	Test sequence B I		
	Tests shall be made at the following values of voltage applied to the relevant terminals: - 0,85 times the minimum rated voltage for the tests specified in B.8.2.4 and B.8.2.5.1; - 1,1 times the maximum rated voltage for the tests specified in B.8.2.5.2.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	CBRs with more than one rated frequency or a range of rated frequencies shall be tested in each case at the highest and lowest rated frequency. However, for CBRs rated at 50 Hz and 60 Hz, tests at 50 Hz or 60 Hz are considered to cover the requirements.		N/A
B.8.2.4	Off-load test at 20 °C ± 5 °C		N/A
B.8.2.4.1	Verification of operating in case of steady increase of the residual current (figure B.1)		N/A
	Increase the residual current from 0,2 IΔn to IΔn in 30 sec. Required: value between IΔno and IΔn		N/A
	Min. setting IΔn.(mA): Interm. setting IΔn.(mA): Max. setting IΔn.(mA):		N/A
B.8.2.4.2	Verification of operating in case of closing on residual current (figure B.1)		N/A
	The CBR is closes on IΔn or each specified setting Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
B.8.2.4.3	Verification of operating in case of a sudden appearance of the residual current (figure B.1)		N/A
	A residual current is sudden appear on the CBR of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
B.8.2.4.4	Verification of the limiting non-operating time of time delayed type CBRs		N/A
	A residual current is sudden appear on the CBR of 2 IΔn for a time declared by the manufacturer Required : The CBR shall not operate		N/A
	Min. setting IΔn. Min. setting time delay (ms): Min. setting IΔn. Max. setting time delay (ms):		N/A
B.8.2.5	Tests at the temperature limits		N/A
	General		
	Minimum temperature (°C)		
	Maximum temperature (°C)		N/A
B.8.2.5.1	Verification of operating in case of a sudden appearance of the residual current at – 5°C or minimum temperature limit		N/A
	A residual current is sudden appear on the CBR of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1: (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	Verification of the limiting non-operating time of time delayed type CBRs at –5°C or minimum temperature limit		N/A
	A residual current is sudden appear on the CBR of 2 IΔn for a time declared by the manufacturer Required : The CBR shall not operate		N/A
	Min. setting IΔn. Min. setting time delay (ms): Min. setting IΔn. Max. setting time delay (ms):		N/A
B.8.3.5.2	Verification of operating in case of a sudden appearance of the residual current at +40°C		N/A
	A residual current is sudden appear on the CBR of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn for a time declared by the manufacturer Required : The CBR shall not operate		N/A
	Min. setting IΔn. Min. setting time delay (ms): Min. setting IΔn. Max. setting time delay (ms):		N/A
B.8.3	Verification of dielectric properties		N/A
B.8.3.3.2	Verification of rated impuls withstand voltage		N/A
	rated impulse withstand voltage		
	test impulse voltage (see table 12 part 1)		
	test impulse voltage for isolating (see table 14 part 1)		
B.8.4	Verification of the operation of the test device at the limits of the rated voltage		N/A
	For CBRs having an adjustable time-delay the test is made at the maximum setting of time-delay:	_____ s	
B.8.4.a	Setting IΔn or minimum setting of IΔn	_____ A	
	Test voltage (1,1 x Ue max)	_____ V	
	Number of operations	25	
	Interval time	5 s	
	Tripping	☐ Yes / ☐ No	N/A
B.8.4.b	Setting IΔn or maximum setting of IΔn	_____ A	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test voltage (0,85 x Ue min)	_____ V	
	Number of operations	3	
	Interval time	5 s	
	Tripping	☐ Yes / ☐ No	N/A
B.8.4.c	Setting IΔn or minimum setting of IΔn	_____ A	
	Test voltage (1,1 x Ue max)	_____ V	
	Number of operations	1	
	Operating means of the test device held in close position	5 s	
	Tripping	☐ Yes / ☐ No	N/A
B.8.5	Verification of the limiting value of non-operating current under overcurrent conditions, in case of a single phase load.		N/A
	Setting IΔn or minimum setting of IΔn if adjustable	_____ A	
	Test current equal to the lower value of: ☐ 6 x In or ☐ 80 % of the maximum short-circuit release current setting	_____ A	
	Test voltage: ☐ rated voltage or ☐ any convenient voltage	_____ V	
	Test frequency	_____ Hz	
	Power factor (0,5)	_____	
	Current flow time	2 s	
	Interval time	60 s	
	Calibration plot number	_____	
	No tripping / change of state		N/A
B.8.6	Resistance against unwanted tripping due to surge currents resulting from impulse voltages		N/A
B.8.6.1	Verification of the resistance to unwanted tripping in case of loading of the network capacitance		N/A
	Current surge test for CBR (0,5 µs / 100kHz ring wave test)		
	One pole of the CBR is submitted to 10 applications of a surge current according to the following requirements:		
	- peak value: 200 A + 10/0%		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- virtual front time: 0,5 µs ± 30%		
	- period of the following oscillatory wave: 10 µs ± 20%		
	- each successive peak: about 60% of the preceding peak		
	The polarity shall be inverted after every two applications		
	The interval between two consecutive applications shall be about 30 s		
	During the test the CBR shall not trip:	-	N/A
B.8.6.2	Verification of the resistance to unwanted tripping in case of flashover without follow-on current.		N/A
	Verification of behaviour at surge current up to 250 A (8/20 µs surge current test)		N/A
	One pole of the CBR is submitted to 10 applications of a surge current according to the following requirements:		
	- peak value: 250 A + 10/0%		
	- virtual front time: 8 µs ± 20%		
	- virtual time to half value: 20 µs ± 20%		
	- peak of reverse current:: less than 30% of peak value		
	The polarity shall be inverted after every two applications		
	The interval between two consecutive applications shall be about 30 s		
	During the test the CBR shall not trip:		N/A
B.8.7	Verification of the behaviour in case of an earth fault current comprising a d.c. component.		N/A
	Type A CBR		N/A
	For CBRs the operation of which depends on a voltage source the test are made at 1,1 and 0,85 times the rated voltage of the voltage source (Us).		
B.8.7.2.1	Verification of operation in case of a continuous rise of a residual pulsating direct current		N/A
	Rated voltage	_____ V	
	- steady increase from zero to: 1,4 IΔn for IΔn > 0,015 A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- steady increase from zero to: 2 IΔn for IΔn ≤ 0,015 A with 2 IΔn/30 A/s (mA)	_____ mA	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- angle = 0 (+/-) :		
	- angle = 90 (+/-) :		
	- angle = 135 (+/-) :		
	No value exceeds the relevant specified limiting values		N/A
B.8.7.2.2	Verification of operation in case of a suddenly appearing residual pulsating direct current		N/A
	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle = 0°)		N/A
	Rated voltage	_____ V	
	RCCB's with IΔn > 0,015 A:		
	- maximum break time (ms) at: 1,4 IΔn (+/-) :		
	- maximum break time (ms) at: 2,8 IΔn (+/-) :		
	- maximum break time (ms) at: 7 IΔn (+/-) :		
	- maximum break time (ms) at: 14 IΔn (+/-) :		
	No value exceeds the relevant specified limiting value		N/A
	RCCB's with IΔn ≤ 0,015 A:		N/A
	- maximum break time (ms) at: 2 IΔn (+/-) :		
	- maximum break time (ms) at: 4 IΔn (+/-) :		
	- maximum break time (ms) at: 10IΔn (+/-) :		
	- maximum break time (ms) at: 20 IΔn (+/-) :		
	No value exceeds the relevant specified limiting value		N/A
B.8.7.2.3	Verification of operation with load at reference temperature		N/A
	Rated voltage	_____ **V**	
B.8.7.2.1	- steady increase from zero to: 1,4 IΔn for IΔn > 0,015 A with 1,4 IΔn/30 A/s (mA)	_____ **mA**	
	- steady increase from zero to: 2 IΔn for IΔn ≤ 0,015 A with 2 IΔn/30 A/s (mA)	_____ **mA**	
	- angle = 0 (+/-) :		
	- angle = 90 (+/-) :		
	- angle = 135 (+/-) :		
	No value exceeds the relevant specified limiting values		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
B.8.7.2.2	Verification of operation in case of a suddenly appearing residual pulsating direct current		N/A
	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle = 0°)		N/A
	Rated voltage	_____ V	
	RCCB's with IΔn > 0,015 A:		
	- maximum break time (ms) at: 1,4 IΔn (+/-) :		
	- maximum break time (ms) at: 2,8 IΔn (+/-) :		
	- maximum break time (ms) at: 7 IΔn (+/-) :		
	- maximum break time (ms) at: 14 IΔn (+/-) :		
	No value exceeds the relevant specified limiting value		N/A
	RCCB's with IΔn ≤ 0,015 A:		N/A
	- maximum break time (ms) at: 2 IΔn (+/-) :		
	- maximum break time (ms) at: 4 IΔn (+/-) :		
	- maximum break time (ms) at: 10IΔn (+/-) :		
	- maximum break time (ms) at: 20 IΔn (+/-) :		
	No value exceeds the relevant specified limiting value		N/A
B.8.7.2.4	Verification of operation of a residual pulsating direct current superimposed by a smooth direct current of 6 mA.		N/A
	Rated voltage	_____ V	
	- steady increase from zero to: 1,4 IΔn for IΔn > 0,015 A with 1,4 IΔn/30 A/s (mA) + 6 mA	_____ mA	
	-steady increase from zero to: 2 IΔn for IΔn ≤ 0,015 A with 2 IΔn/30 A/s (mA) + 6 mA	_____ mA	
	- angle = 0 (+/-) :		
	No value exceeds the relevant specified limiting values		N/A
B.8.8	Verification of the behaviour of CBRs functionally dependent on line voltage classified under B.3.1.2.1		N/A
	For CBRs having an adjustable residual operating current, the test is made at the lowest setting.		
	For CBRs with an adjustable time-delay, the test is made at any one of the time-delay settings.		
B.8.8.1	Determination of the limiting value of the line voltage		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A voltage equal to the rated voltage is applied to the line terminals of the CBR and is then progressively lowered to zero over a time period corresponding to the longer of the two values given hereinafter until automatic opening occurs: – about 30 s; – a period long enough with respect to the delayed opening of the CBR, if any (see B.7.2.11).		
	Three measurements are made. All the values shall be less than 0,85 times the minimum rated voltage of the CBR.		N/A
	A residual current is sudden appear on the CBR of IΔn (_____ mA) at a value just above highest measured value Required : no value exceeds the specified limiting value of Table B1: 300 ms		N/A
	For any value of voltage less than the lowest value measured, it is not be possible to close the CBR by manual operating means.		N/A
B.8.8.2	Verification of the automatic opening in the case of failure of the line voltage		N/A
	The CBR being closed, a voltage equal to its rated voltage, or, in the case of a range of rated voltages, any one of the rated voltages is applied to its line terminals. The voltage is then switched off. The CBR shall trip. The time interval between the switching off and the opening of the main contacts is measured.		N/A
	for CBRs opening without delay no value shall exceed 0,2 s;		N/A
	for CBRs opening with delay the maximum and minimum values shall be situated within the range indicated by the manufacturer.		N/A
B.8.9	Verification of the behaviour of CBRs functionally dependent on line voltage in the case of failure of line voltage		N/A
	For CBRs having an adjustable residual operating current, the test is made at the lowest setting. For CBRs having an adjustable time-delay the test is made at any one of the time-delay settings.		N/A
B.8.9.1	Case of loss of one phase in a 3-phase system (for 3-pole and 4-pole CBRs)		N/A
	The CBR is connected according to figure B.3 and is supplied on the line side at 0,85 times the rated voltage, or, in the case of a range of rated voltages, at 0,85 times the lowest value of rated voltage.		N/A
	Verification with one phase is switched off		N/A
B.8.2.4.3	Verification of operating in case of a sudden appearance of the residual current		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A residual current is sudden appear on the CBR of IΔn Required: no value exceeds the specified limiting value of Table B1: (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	Verification with other phase switched off		N/A
B.8.2.4.3	Verification of operating in case of a sudden appearance of the residual current (figure B.1)		N/A
	A residual current is sudden appear on the CBR of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the CBR of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	Test is repeated with resistor connected to other two phases in turn.		N/A
B.8.9.2	Case of voltage drop due to an overcurrent resulting from a low impedance fault to earth		N/A
	The CBR is connected according to figure B.3 and is supplied on the line side with the rated voltage or, in the case of a range of rated voltages, with the lowest rated voltage.		
	The supply is switched off. The CBR shall not trip.		N/A
	With supply connected the voltage is reduced as follows: a) for CBRs for use with a three-phase supply: to 70 % of the lowest rated voltage;		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	b) for CBRs for use with a single phase supply: to 85 V applied as follows: – for single-pole and two-pole CBRs: between poles; – for three-pole and four-pole CBRs, declared as suitable for use with a single-phase supply (see B.5 e)): between each combination of two poles, connected according to the manufacturer's specification.		
	A current of value $I\Delta n$ is then applied to a) and/or b), as applicable. The CBR shall trip.		N/A
BII	Test sequence BII		
B.8.10	Verification of the residual short-circuit making and breaking capacity		
	Where applicable, the CBR is adjusted at the lowest setting of residual operating current and at the maximum setting of time-delay.		
	If the CBR has more than one value of I_{cu}, each one having a corresponding value of $I\Delta m$, the test is made at the maximum value of $I\Delta m$, at the corresponding phase-to-neutral voltage.		
	maximum value of $I\Delta m$		
	Type designation or serial number		
	Sample no:		
	Point of test circuit which is directly earthed:		
	Grid distance "a" (mm):		
	Fine wire diameter (mm):		
	Prospective current (A):		
	Prospective current obtained (A):		
	Power factor / ratio *n*:		
	Power factor / ratio *n* obtained:		
	Plot no.		
	Test sequence: O-t-CO		
	I^2t (kA^2s); Ip (kA):	O operation: Ip :_____kA I^2t; _____kA^2s Plot no. _____	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
		CO operation: Ip :_____kA I^2t; _____kA^2s Plot no.: _____	
	If tested at separate testing station see report		
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		N/A
B.8.10.3	Conditions of the CBR after test		N/A
	After the tests no damage impairing further use		N/A
	Dielectric strength test of the main circuit at test voltage of 2 Un for 5 s:		N/A
	Test voltage		N/A
	Making and breaking its rated current at its maximum rated operational voltage.		N/A
B.8.10.3.2	The CBR shall be capable of performing satisfactorily the tests specified in B.8.2.4.3, but at a value of 1,25 IΔn and without measurement of break time. The test is made on any one pole, taken at random.		N/A
	If the CBR has an adjustable residual operating current, the test is made at the lowest setting, at a current of a value of 1,25 times that setting.		N/A
B.8.10.3.3	Where applicable the CBR shall also be submitted to the test of B.8.2.4.4.		N/A
B.8.2.4.4	Verification of the limiting non-operating time of time delayed type CBRs		N/A
	A residual current is sudden appear on the CBR of 2 IΔn for a time declared by the manufacturer Required : The CBR shall not operate		N/A
	Min. setting IΔn. Min. setting time delay (ms): Min. setting IΔn. Max. setting time delay (ms):		N/A
B.8.10.3.4	CBRs functionally dependent on line voltage shall also satisfy the tests of B.8.8 or B.8.9, as applicable.		N/A
B III	Test sequence B III		
B.8.11	Verification of the effects of environmental conditions		N/A
	The test is carried out according to IEC 60068-2-30.		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The upper temperature shall be 55 °C ± 2 °C (variant 1) and the number of cycles shall be – 6 for IΔn > 1 A – 28 for IΔn≤1 A		
	At the end of the cycles the CBR shall be capable of complying with the tests of B.8.2.4.3, but with a residual operating current of 1,25 IΔn and without measurement of break time. Only one verification need be made.		N/A
	Where applicable the CBR shall also comply with the test of B.8.2.4.4. Only one verification need be made.		N/A
B.8.2.4.4	Verification of the limiting non-operating time of time delayed type CBRs		N/A
	A residual current is sudden appear on the CBR of 2 IΔn for a time declared by the manufacturer Required : The CBR shall not operate		N/A
	Min. setting IΔn. Min. setting time delay (ms): Min. setting IΔn. Max. setting time delay (ms):		N/A
B.8.12	Verification of electromagnetic compatibility (EMC)		
	See report:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
Annex C	Individual pole short-circuit test sequence		
	Circuit-breaker for use on phase-earthed systems		
C.2	Test of individual pole short-circuit breaking capacity		
	A short-circuit test is made with a value of prospective current (Isu) equal to 25% of the ultimate rated short-circuit breaking capacity (Icu)		
	Type designation or serial number		
	Sample no:		
	Rated current: In (A)		
	Rated operational voltage: Ue (V)		
	Rated ultimate short-circuit breaking capacity: (kA)		
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (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 Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		N/A
	Test made in free air:		N/A
	Distances of the metallic screen's: (all sides)		N/A
	The characteristics of the metallic screen:		
	- woven wire mesh		N/A
	- perforated metal		N/A
	- expanded metal		N/A
	- ratio hole area/total area: 0,45-0,65		N/A
	- size of hole: <30mm^2		N/A
	- finish: bare or conductive plating		N/A
	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		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Circuit is earthed at: (load-star- or supply-star point)		N/A
	Conductor cross-sectional area (mm²):		N/A
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)		N/A
	Test sequence of operation: O – t – CO		N/A
	Test circuit according figure: 9		N/A
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:		N/A
	short-circuit test current (Isu): equal to 25% of the ultimate rated short-circuit breaking capacity (Icu)		N/A
	- r.m.s. test current AC/DC: (A):		N/A
	power factor/time constant:		N/A
	- Factor "n"		N/A
	- peak test current (Amax):		N/A
	Test sequence "O" L1		
	- max. let-through current: (kApeak) L1:		N/A
	- Joule integral I²dt (A²s) L1:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO" L1		
	- max. let-through current: (kApeak) L1:		N/A
	- Joule integral I²dt (A²s) L1:		N/A
	Test sequence "O" L2		
	- max. let-through current: (kApeak) L2:		N/A
	- Joule integral I²dt (A²s) L2:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO" L2		
	- max. let-through current: (kApeak) L2:		N/A
	- Joule integral I²dt (A²s) L2:		N/A
	Test sequence "O" L3		
	- max. let-through current: (kApeak) L3:		N/A
	- Joule integral I²dt (A²s) L3:		N/A
	Pause, t: (min)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "CO" L3		
	- max. let-through current: (kApeak) L3:		N/A
	- Joule integral I^2dt (A^2s) L3:		N/A
	Melting of the fusible element		N/A
	Holes in the PE-sheet for test sequence "O"		N/A
	Cracks observed		N/A
C.3	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V		N/A
	- no breakdown or flashover		N/A
C.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:		
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:		N/A
Annex F	Additional tests for circuit-breakers with electronic over-current protection - 1 sample: 3P, 400A, DS 1, F-1		
F4 and F5	Verification of electromagnetic compatibility (EMC)		
	See report:	**130700020SHA-001**	P
F6	Suitability for multiple frequencies		N/A
	The tests shall be performed at each rated frequency or, when a range of rated frequencies is declared, at the lowest and the highest rated frequencies.		N/A
F.6.2	Tests shall be performed on any pair of phase-poles chosen at random at any convenient voltage. Under-voltage releases, if any, shall either be energized or disabled. All other auxiliaries shall be disconnected during the test.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The short-time and instantaneous trip current settings shall each, if relevant, be adjusted to 2,5 times the current setting. If this setting is not available, the next closest higher setting shall be used.		
	A current of 0,95 times the conventional non-tripping current (see Table 6) is applied for a time equal to 10 times the tripping time which corresponds to 2,0 times the current setting.		
	Immediately following the test of a), a current of 1,05 times the conventional tripping current (see Table 6) is applied.		
	A further test starting from the cold state is made at 2,0 times the current setting.		
	For each test frequency, the overload tripping characteristics shall comply with the following requirements: – for test a) no tripping shall occur; – for test b) tripping shall occur within the conventional time (see Table 6); – for test c) tripping shall occur within 1,1 times the maximum and 0,9 times the minimum values of the manufacturer's stated time-current characteristic.		N/A
F.7.	Dry heat test		P
F.7.1	The test shall be performed on the circuit-breaker in accordance with 7.2.2 at the maximum rated current for a given frame size, on all phase poles, at an ambient temperature of 40 °C	In= 400 A	
	The duration of the test, once temperature equilibrium is reached, shall be 168 h		
	Tightening torques applied to the terminals shall be in accordance with the manufacturers' instructions. In absence of such instructions, table 4 of IEC 60947-1 shall apply	Torque= 10 Nm	
	As an alternative, the test may be performed as follows:		
	- measure and record the highest temperature rise of the air surrounding the electronic components, during the temperature rise verification of test sequence 1	Ambient temperature during temperature rise test: -- °C	N/A
	- install the electronic controls in the chamber		N/A
	- supply the electronic controls which there input energizing value		N/A
	- adjust the temperature of the test chamber to a value of 40 K above the temperature rise recorded for the surrounding the electronic components and maintain this temperature for 168 h	Chamber temperature: °C	N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test carried out.....:	☒ normal ☐ alternative	
F.7.2	Test results		P
	The circuit-breaker and the electronic controls shall meet the following requirements:		
	- no tripping of the circuit-breaker shall occur		P
	- no operating of the electronic controls which would cause the circuit-breaker to trip shall occur		P
F.7.3	Verification of the overload releases		P
	Following the test F.7.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I_{test}: 520A Ambient temperature: 27,8°C	P
7.2.1.2.4	Opening by over-current releases		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 + 10% of the tripping current value of the current setting for all values of current setting of the overload release		N/A
2)	Inverse timer-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	I_{test} :420A Non- tripping time >2h	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	I_{test}: 520 A Operating time: 28,5s	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
F.8.	Damp heat test		P
F.8.1	Test procedure		P
	The test shall be performed according to IEC 60068-2-30 (12 +12 hours cycle)		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test Db temperature cycle between 25°C and upper temperature		
	The upper temperature shall be 55°C ± 2 °C (variant 1) and number of cycles shall be six.		
	The relative humidity is maintained at a high level at the upper temperature		
	The test may be performed with only the electronic controls in the test chamber		
	Test result.....:	OK	P
F.8.2	Verification of the overload releases		P
	Following the test F.8.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I_{test}: 520A Ambient temperature: 26,8°C	P
7.2.1.2.4	Opening by over-current releases		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 + 10% of the tripping current value of the current setting for all values of current setting of the overload release		N/A
2)	Inverse timer-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	I_{test} :420A Non- tripping time >2h	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	I_{test}: 520 A Operating time: 28,3s	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
F.9.	Temperature variation cycles at a specified rate of change		P
F.9.1	Test conditions		P
	Each design of electronic controls shall be		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	submitted to temperature variation cycles in according with figure F.15		
	The rise and fall of temperature during the rate of variation shall be 1 K/min ± 0,2 K/min.		
	Their temperature, once reached, shall be maintained for at least 2 h.		
	The number of cycles shall be 28.		
F.9.2	Test procedure		P
	The test shall be carried out according IEC 60068-2-14.		
	For the these test, the electronic controls may be mounted inside the circuit-breaker or separately.		
	The electronic controls shall be energized to simulate service conditions.		
	Where the electronics controls are mounted inside the circuit-breaker, the main circuit shall not be energized.		
F.9.3	Test results		P
	The electronic controls shall meet the following requirement.		P
	No operation of the electronic controls which would cause the circuit-breaker to trip during the 28 cycles shall occur.		P
F.9.4	Verification of overload releases		P
	Following the test F.8.1, the operation of the overload releases of the circuit-breaker shall be verified in accordance with 7.2.1.2.4, item b).	I_{test}: 520A Ambient temperature: 26,3°C	P
7.2.1.2.4	Opening by over-current releases		N/A
b)	Opening under overload conditions		N/A
1)	Instantaneous or definite time-delay operation		N/A
	The release shall cause tripping of the circuit-breaker with an accuracy of + 10% of the tripping current value of the current setting for all values of current setting of the overload release		N/A
2)	Inverse timer-delay operation		P
	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	I_{test} :420A Non- tripping time >2h	P

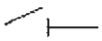
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Moreover, when at the end of the conventional time the value of current is immediately raised to 1,30 times the current setting, i.e. with the conventional tripping current, tripping shall then occur in less than the conventional time later	I_{test}: 520 A Operating time: 28,9s	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
Annex H	Individual pole short-circuit test sequence - 1 sample: 3P, 400A, DS 1, H-1		
	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	DS 1	
	Sample no:	H-1	
	Rated current: In (A)	400	
	Rated operational voltage: Ue (V)	415	
	Rated ultimate short-circuit breaking capacity: (kA)	65	
	Rated control supply voltage of closing mechanism: Uc (V)		
	Rated control supply voltage of shunt release: Uc (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 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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	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 (mm²):	240	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	10,0	P
	Test sequence of operation: O – t – CO		P
	Test circuit according figure: 9	Figure 9	P
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:	438 438 438	P
	Short-circuit test current (I_{nt}): 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,	480A	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~~: (kA)	4,84	P
	power factor/~~time constant~~:	0,67	P
	- Factor "n"	1,5	P
	- peak test current (kAmax) :	7,2	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence "O" L1		
	- max. let-through current: (kApeak) L1:	7,51	P
	- Joule integral I^2dt (MA^2s) L1:	2,59	P
	Pause, t: (min)	3	P
	Test sequence "CO" L1		
	- max. let-through current: (kApeak) L1:	6,97	P
	- Joule integral I^2dt (MA^2s) L1:	1,81	P
	Test sequence "O" L2		
	- max. let-through current: (kApeak) L2:	7,57	P
	- Joule integral I^2dt (MA^2s) L2:	1,63	P
	Pause, t: (min)	3	P
	Test sequence "CO" L2		
	- max. let-through current: (kApeak) L2:	7,54	P
	- Joule integral I^2dt (MA^2s) L2:	1,60	P
	Test sequence "O" L3		
	- max. let-through current: (kApeak) L3:	7,04	P
	- Joule integral I^2dt (kA^2s) L3:	629	P
	Pause, t: (min)	3	P
	Test sequence "CO" L3		
	- max. let-through current: (kApeak) L3:	7,54	P
	- Joule integral I^2dt (kA^2s) L3:	603	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: (kApeak) ..... N:		N/A
	- Joule integral I^2dt (A^2s) ..... N:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO" N		
	- max. let-through current: (kApeak) ..... N:		N/A
	- Joule integral I^2dt (A^2s) ..... N:		N/A
	Melting of the fusible element	No	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Holes in the PE-sheet for test sequence "O"	No	P
	Cracks observed	No	P
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:		N/A
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	2min03s 1min56s 2min09s -	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 market on the circuit-breaker immediately following these values of rated voltage		N/A

Annex J	Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers		
	See report:		N/A
Annex L	Circuit-breakers not fulfilling the requirements for overcurrent protection		
L.3	Classification		
	- class X: with integral non-adjustable instantaneous short-circuit releases for self-protection; - class Y: without integral short-circuit releases.		
L.4	Rated values		
	Rated current: In (A)		
	Rated conditional short-circuit current (Icc)		
L.5	Product information		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A CBI shall be marked according to 5.2, as relevant, except that the symbol of suitability for isolation, if applicable, shall be  , replacing the symbol shown in the second dashed item of 5.2 a).		
	for 5.2, item a): with the symbol according to the classification:		
	for 5.2, item c): with the following items: rated conditional short-circuit-current (Icc); the OCPD, if specified.		
L.6	Constructional and performance requirements		
	A CBI, being derived from the equivalent circuit-breaker (see L.2.1), complies with all the applicable construction and performance requirements of Clause 7, except 7.2.1.2.4. NOTE A CBI may additionally comply with IEC 60947-3 and be marked accordingly.		
L.7	Tests		
L.7.2.2	OCPD specified		
L.7.2.2.2	Verification of Icc		
	The test shall be made with a prospective current equal to I_{cc} of the CBI.		
	Each test shall consist of a O – t – CO sequence of operations made in accordance with 8.3.5.2, the CO operation being made by closing the CBI.		
	After each operation, the CBI shall be manually closed and opened three times.		
L.7.2.2.3	Verification of dielectric withstand		
	Following the test of L.7.2.2.2, the dielectric withstand shall be verified in accordance with 8.3.5.3		
L.7.2.3	OCPD not specified		
L.7.2.3.2	Verification of Icc		
	The test shall be made with a prospective current equal to I_{cc} of the CBI.		
	Each test shall consist of a O – t – CO sequence of operations made in accordance with 8.3.5.2, the CO operation being made by closing the CBI.		
	During the test, the current shall be maintained for three cycles and then disconnected at the power supply.		
	After each operation, the CBI shall be manually closed and opened three times.		
L.7.2.3.3	Verification of dielectric withstand		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Following the test of L.7.2.3.2, the dielectric withstand shall be verified in accordance with 8.3.5.3		

Annex M	Modular residual current devices (without integral current breaking device)		
M.8.3	Operating characteristics		
	Type designation or serial number		
	Sample no:		
	Rated current: In (A)		
	Rated operational voltage: Ue (V)		
	Rated frequency (Hz)		
	Terminal type or through conductor type		
	MRCD with sensing means and processing device combined or separate	Combined/separate	
	MRCD with voltage source		
	Operating automatically in case of failure of the voltage source.	Yes/no	
	Rated insulation voltage (*U*i)		
	Rated impulse withstand voltage (*U*imp)		
	Characteristics of the voltage source of MRCDs		
	Rated values of the voltage source of MRCDs (*U*s)		
	Rated values of the frequencies of the voltage source of MRCDs		
	Rated insulation voltage (*U*i)		
	Rated impulse withstand voltage (*U*imp)		
M.4.1.3	Characteristics of auxiliary contacts		
M.4.2	Characteristics of MRCDs concerning their residual current function		
M.4.2.2	Operating characteristic in case of residual current with d.c. component		
	Type AC MRCD		
	Type A MRCD		
	Type B MRCD		
M.4.3	Behaviour under short-circuit conditions		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated conditional short-circuit current (/cc)		
	Rated conditional residual short-circuit current (/Δc)		
	Rated short-time withstand current (/cw)		
	Rated residual short-time withstand current (/Δw)		
	Peak withstand current		
M.4.4	Preferred and limiting values		
	Preferred values of the rated residual operating current (/Δn)		
	Minimum value of the rated residual non-operating current (/Δno)		
	Limiting value of the non-operating overcurrent in the case of a single-phase load in a multiphase circuit		
	Preferred values of rated voltage of the voltage source of MRCDs		
	Compliance with constructional requirements		N/A
MI	Test sequence MI		
M.8.3.4.2	Verification of operating in case of steady increase of the residual current (figure M.1)		N/A
	Increase the residual current from 0,2 IΔn to IΔn in 30 sec. Required: value between 0,2 IΔn and IΔn		N/A
	Min. setting IΔn.(mA): Interm. setting IΔn.(mA): Max. setting IΔn.(mA):		N/A
M.8.3.4.3	Verification of operating in case of closing on residual current (figure M.2)		N/A
	The MRCD is closes on IΔn or each specified setting Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
M.8.3.4.4	Verification of operating in case of a sudden appearance of the residual current (figure M.2 and M3)		N/A
	A residual current is sudden appear on the MRCD of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of IΔn: 5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms)		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of IΔn: 10 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A residual current is sudden appear on the MRCD of IΔn: 20 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of IΔn: 50 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of IΔn: 100 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of IΔn: 200 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of IΔn: 500 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
M.8.3.4.5	Verification of the limiting non-operating time of time delayed type MRCDs (figure M3)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A residual current is sudden appear on the MRCD of 2 IΔn for a time declared by the manufacturer Required : The MRCD shall not operated		N/A
	Min. setting IΔn. Min. setting time delay (ms): Min. setting IΔn. Max. setting time delay (ms):		N/A
M.8.3.5	Tests at the temperature limits		N/A
M.8.3.5.1	General (clause B.8.2.5 applies)		
	Minimum temperature (°C)		
	Maximum temperature (°C)		
M.8.3.5.2	Verification of operating in case of a sudden appearance of the residual current at –5°C or minimum temperature limit (figure M.2 and M3)		
	A residual current is sudden appear on the MRCD of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	Verification of the limiting non-operating time of time delayed type MRCDs at –5°C or minimum temperature limit (figure M3)		N/A
	A residual current is sudden appear on the MRCD of 2 IΔn for a time declared by the manufacturer Required : The MRCD shall not operated		N/A
	Min. setting IΔn. Min. setting time delay (ms): Min. setting IΔn. Max. setting time delay (ms):		N/A
M.8.3.5.3	Verification of operating in case of a sudden appearance of the residual current at +40°C (figure M.2 and M3)		N/A
	A residual current is sudden appear on the MRCD of IΔn Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of 2 IΔn Required : no value exceeds the specified limiting value of Table B1 (150 ms) or Table B2 (200 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of ☐ 5 IΔn or ☐ 0,25 A Required : no value exceeds the specified limiting value of Table B1 (40ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of ☐10 IΔn or ☐ 0,5 A Required : no value exceeds the specified limiting value of Table B1 (40 ms) or Table B2 (150 ms) and a non actuating time of 60 ms		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Min. setting IΔn.(ms): Interm. setting IΔn.(ms): Max. setting IΔn.(ms):		N/A
	A residual current is sudden appear on the MRCD of 2 IΔn for a time declared by the manufacturer Required : The MRCD shall not operated		N/A
	Min. setting IΔn. Min. setting time delay (ms): Min. setting IΔn. Max. setting time delay (ms):		N/A
M.8.4.	Verification of dielectric properties		N/A
M.8.4.1	Verification of rated impuls withstand voltage		N/A
	rated impulse withstand voltage		
	test impulse voltage (see table 12 part 1)		
	test impulse voltage for isolating (see table 14 part 1)		
M.8.4.1.2	Verification of rated impulse withstand voltage with respect to the monitored circuit		N/A
M.8.4.1.2.1	Test for terminal type MRCD		N/A
M.8.4.1.2.2	Tests for MRCDs of through-conductor type		N/A
M.8.4.1.3	Verification of rated impulse withstand voltage of the voltage source circuit (if applicable)		N/A
M.8.5	Verification of the operation of the test device at the limits of the rated voltage		N/A
	For MRCDs having an adjustable time-delay the test is made at the maximum setting of time-delay:	_____ s	
M.8.5.a	Setting IΔn or minimum setting of IΔn	_____ A	
	Test voltage (1,1 x Ue max)	_____ V	
	Number of operations	25	
	Interval time	5 s	
	Tripping	☐ Yes / ☐ No	N/A
M.8.5.b	Setting IΔn or minimum setting of IΔn	_____ A	
	Test voltage (0,85 x Ue max)	_____ V	
	Number of operations	3	
	Interval time	5 s	
	Tripping	☐ Yes / ☐ No	N/A
M.8.5.c	Setting IΔn or minimum setting of IΔn	_____ A	
	Test voltage (1,1 x Ue max)	_____ V	
	Number of operations	1	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating means of the test device held in close position	5 s	
	Tripping	☐ Yes / ☐ No	N/A
M.8.6	Verification of the limiting value of non-operating current under overcurrent conditions , in case of a single phase load.		N/A
M.8.6	Circuit diagram	Fig. M4 ____	
	Setting IΔn or minimum setting of IΔn if adjustable	_____ A	
	Test current equal to the lower value of: ☐ 6 x In or ☐ 80 % of the maximum short-circuit release current setting	_____ A	
	Test voltage: ☐ rated voltage or ☐ any convenient voltage	_____ V	
	Test frequency	_____ Hz	
	Power factor (0,5)	_____	
	Current flow time	2 s	
	Interval time	60 s	
	Calibration plot number	_____	
	No tripping / change of state		N/A
M.8.7	Resistance against unwanted tripping due to surge currents resulting from impulse voltages		N/A
M.8.7.2	Verification of the resistance to unwanted tripping in case of loading of the network capacitance		N/A
B.8.6.1	Current surge test for RMCDs (0,5 µs / 100kHz ring wave test)		
	One pole of the MRCD is submitted to 10 applications of a surge current according to the following requirements:		
	- peak value: 200 A + 10/0%		
	- virtual front time: 0,5 µs ± 30%		
	- period of the following oscillatory wave: 10 µs ± 20%		
	- each successive peak: about 60% of the preceding peak		
	The polarity shall be inverted after every two applications		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The interval between two consecutive applications shall be about 30 s		
	During the test the MRCD shall not trip:	-	N/A
M.8.7.3	Verification of the resistance to unwanted tripping in case of flashover without follow-on current.		N/A
B.8.6.2	Verification of behaviour at surge current up to 250 A (8/20 µs surge current test)		N/A
	One pole of the MRCD is submitted to 10 applications of a surge current according to the following requirements:		
	- peak value: 250 A + 10/0%		
	- virtual front time: 8 µs ± 20%		
	- virtual time to half value: 20 µs ± 20%		
	- peak of reverse current:: less than 30% of peak value		
	The polarity shall be inverted after every two applications		
	The interval between two consecutive applications shall be about 30 s		
	During the test the MRCD shall not trip:		N/A
M.8.8	Verification of the behaviour in case of an earth fault current comprising a d.c. component.		N/A
M.8.8.2	Type A MRCD		N/A
	For MRCDs the operation of which depends on a voltage source the test are made at 1,1 and 0,85 times the rated voltage of the voltage source (Us).		
M.8.8.2.2	Verification of operation in case of a continuous rise of a residual pulsating direct current		N/A
	Rated voltage	_____ V	
B.8.7.2.1	- steady increase from zero to: 1,4 IΔn for IΔn > 0,015 A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- steady increase from zero to: 2 IΔn for IΔn ≤ 0,015 A with 2 IΔn/30 A/s (mA)	_____ mA	
	- angle = 0 (+/-) :		
	- angle = 90 (+/-) :		
	- angle = 135 (+/-) :		
	No value exceeds the relevant specified limiting values		N/A
M.8.8.2.3	Verification of operation in case of a suddenly appearing residual pulsating direct current		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
B.8.7.2.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle = 0°)		N/A
	Rated voltage	_____ V	
	RCCB's with IΔn > 0,015 A:		
	- maximum break time (ms) at: 1,4 IΔn (+/-) :		
	- maximum break time (ms) at: 2,8 IΔn (+/-) :		
	- maximum break time (ms) at: 7 IΔn (+/-) :		
	- maximum break time (ms) at: 14 IΔn (+/-) :		
	No value exceeds the relevant specified limiting value		N/A
	RCCB's with IΔn ≤ 0,015 A:		N/A
	- maximum break time (ms) at: 2 IΔn (+/-) :		
	- maximum break time (ms) at: 4 IΔn (+/-) :		
	- maximum break time (ms) at: 10IΔn (+/-) :		
	- maximum break time (ms) at: 20 IΔn (+/-) :		
	No value exceeds the relevant specified limiting value		N/A
M.8.8.2.4	Verification of operation with load at reference temperature		N/A
	Rated voltage	_____ **V**	
B.8.7.2.1	- steady increase from zero to: 1,4 IΔn for IΔn > 0,015 A with 1,4 IΔn/30 A/s (mA)	_____ **mA**	
	- steady increase from zero to: 2 IΔn for IΔn ≤ 0,015 A with 2 IΔn/30 A/s (mA)	_____ **mA**	
	- angle = 0 (+/-) :		
	- angle = 90 (+/-) :		
	- angle = 135 (+/-) :		
	No value exceeds the relevant specified limiting values		N/A
M.8.8.2.5	Verification of operation of a residual pulsating direct current superimposed by a smooth direct current of 6 mA.		N/A
	Rated voltage	_____ V	
B.8.7.2.1	- steady increase from zero to: 1,4 IΔn for IΔn > 0,015 A with 1,4 IΔn/30 A/s (mA) + 6 mA	_____ mA	
	-steady increase from zero to: 2 IΔn for IΔn ≤ 0,015 A with 2 IΔn/30 A/s (mA) + 6 mA	_____ mA	
	- angle = 0 (+/-) :		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting values		N/A
M.8.8.3	Type B MRCD		N/A
M.8.8.3.2	Verification of operation in case of a slowly rising residual smooth direct current		
	Rated voltage (1,1*Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 90 (+/-) :		
	Operation shall occur between 0,5 and 2Idn		N/A
	Rated voltage (0,85*Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)		
	- angle = 90 (+/-) :		
	Operation shall occur between 0,5 and 2Idn		N/A
M.8.8.3.3	Verification of operation in case of a suddenly appearing residual smooth direct current		N/A
B.8.7.2.2	Verification of the correct operation in case of suddenly appearing a smooth residual direct currents by closing S2		
	Rated voltage (1,1*Un)	_____ V	
	RCCB's with IΔn > 0,015 A:		
	- maximum break time (ms) at: 2 IΔn (+/-) :		
	- maximum break time (ms) at: 4 IΔn (+/-) :		
	- maximum break time (ms) at: 10 IΔn (+/-) :		
	- maximum break time (ms) at: 20 IΔn (+/-) :		
	No value exceeds the relevant specified limiting value		N/A
B.8.7.2.2	Verification of the correct operation in case of suddenly appearing a smooth residual direct currents by closing S2		N/A
	Rated voltage (0,85*Un)	_____ V	
	RCCB's with IΔn > 0,015 A:		
	- maximum break time (ms) at: 2 IΔn (+/-) :		
	- maximum break time (ms) at: 4 IΔn (+/-) :		
	- maximum break time (ms) at: 10 IΔn (+/-) :		
	- maximum break time (ms) at: 20 IΔn (+/-) :		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		N/A
M.8.8.3.4	Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by a three-pulse star or a six-pulse connection.		N/A
	Rated voltage (1,1*Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 90 (+/-) :		
	Operation shall occur between 0,5 and 2Idn		N/A
	Rated voltage (0,85*Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 90 (+/-) :		
	Operation shall occur between 0,5 and 2Idn		N/A
M.8.8.3.5.	Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by two-pulse bridge connection line-to-line.		N/A
	Rated voltage (Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 0 (+/-) :		
	Operation shall occur between 0,5 and 1,4Idn		N/A
M.8.8.3.6	Verification of operation with load at the reference temperature		N/A
M.8.8.3.6-M.8.8.3.2	Verification of operation in case of a slowly rising residual smooth direct current		N/A
	Rated voltage (1,1*Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 90 (+/-) :		
	Operation shall occur between 0,5 and 2Idn		N/A
	Rated voltage (0,85*Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 90 (+/-) :		
	Operation shall occur between 0,5 and 2Idn		N/A
M.8.8.3.6-M.8.8.3.4	Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by a three-pulse star or a six-pulse connection		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated voltage (1,1*Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 90 (+/-) :		
	Operation shall occur between 0,5 and 2Idn		N/A
	Rated voltage (0,85*Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 90 (+/-) :		
	Operation shall occur between 0,5 and 2Idn		N/A
M.8.8.3.6-M.8.8.3.5.	Verification of operation in case of a slowly rising residual current resulting from a fault in a circuit fed by two-pulse bridge connection line-to-line.		N/A
	Rated voltage (Un)	_____ V	
B.8.7.2.1	- steady increase from zero to: 2 IΔn A with 1,4 IΔn/30 A/s (mA)	_____ mA	
	- angle = 0 (+/-) :		
	Operation shall occur between 0,5 and 1,4Idn		N/A
M.8.9.	Verification of the behaviour of MRCDs with separate sensing means in case of a failure of the sensing means connection		N/A
M.8.9.2	Test method 1		N/A
	Rated voltage of the sensing means		
	Interval time Required <5 sec		N/A
M.8.9.3	Test method 2		N/A
	Test shall be carried out as follows: - The test device is activated - The sensing means are disconnected and the test device is activated. The MRCD shall not operate		
	Rated voltage of the sensing means		
	Test device activated MRCD shall operate		N/A
	Rated voltage of the sensing means		
	Sensing device disconnected and Test device activated MRCD shall not operate		N/A
M.8.10	Verification of temperature-rise of terminal type MRCDs		N/A
M.8.10.2	Tambient: _____°C		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.2.5	Main circuits		
	Conventional thermal current I_{th}	_____ A	
	Conventional thermal current for enclosure I_{the}	_____ A	
	Conventional thermal current for the neutral pole	_____ A	
	Cabling characteristics		
	Cable	_____ mm^2	
	Bar / number / length	_____ mm / ___ / ____ m	
	Arrangement	☐ 3 phase - ☐ poles on serie	
	Tightening torque	_____ Nm	
	Neutral pole (if applicable)		
	Cable	_____ mm^2	
	Bar / number / length	_____ mm / ___ / ____ m	
	Tightening torque	_____ Nm	
	Terminals(see table 2)		
	Manual operating means		
	Parts which need not be touched but not hand held		
	Parts which need not be touched during normal operation		
M.8.11	Verification of mechanical and electrical endurance		N/A
	For MRCDs having more than one output rating, two tests shall be made: – a test at the highest rated current at the corresponding voltage; – a test at the highest rated voltage at the corresponding current.		
	500 off-load operations controlled by the test device		
	Rated voltage:	_____ V ☐ ac ☐ dc	
	Result:	after___ operations,	N/A
	500 off load operations by passing the rated residual operating current IΔn through one current path		
	Rated voltage:	_____ V ☐ ac ☐ dc	
	Rated residual current	____ mA	
	Result:	after___ operations,	N/A
	500 on-load operations controlled by the test device		
	Rated voltage:	_____ V ☐ ac ☐ dc	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current	_____ A	
	Power factor	_____	
	Test circuit		
	Result:	after___ operations,	N/A
	500 on-load operations by passing the rated residual operating current IΔn through one current path.		
	Rated voltage:	_____ V ☐ ac ☐ dc	
	Test current	_____ A	
	Power factor	_____	
	Test circuit		
	Rated residual current	____ mA	
	Result:	after___ operations,	N/A
	Show no damage		N/A
	High voltage test: twice rated voltage	Test voltage: _____ V	N/A
	A residual current is sudden appear on the MRCD of IΔn (_____ mA) Required : no value exceeds the specified limiting value of Table B1 (300 ms) or Table B2 (500 ms) and a non actuating time of 60 ms		N/A
M.8.12.	Verification of the behaviour of MRCDs in case of failure of the voltage source for MRCDs classified under M.3.2.2.1		N/A
M.8.12.2	Determination of the limiting value of the voltage source		N/A
	Source voltage (Us)	Max Us: _____ V ☐ac ☐ dc	
		Min Us: _____ V ☐ac ☐dc	
	Adjustable residual current setting	_____ mA (lowest)	
	Adjustable time-delay setting	_____ s	
	Time period of voltage decreasing	30 s or a period enough with respect to delayed opening	
	Min voltage to automatic opening (U > 0,85 x Us)		
	A residual current is sudden appear on the MRCD of IΔn (_____ mA) at a value just above highest measured value Required : no value exceeds the specified limiting value of Table B1: 300 ms		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	It's not possible to switch "ON" by manual operating means at a lower value than the lower measured value.		N/A
M.8.12.3	Verification of automatic opening in case of voltage source failure		N/A
	Source voltage (Us)	Max Us: _____ V ☐ac ☐ dc	
		Min Us: _____ V ☐ac ☐dc	
	Adjustable residual current setting	_____ mA (lowest)	
	Adjustable time-delay setting	_____ s	
	Time period	Max 1 s or max. 1 s+time delay setting	
	Time period to automatic opening		
	No value exceeds the relevant specified limiting value		N/A
M.8.13	Verification of the behaviour of MRCDs with voltage source as classified under M.3.2.2.2 in case of failure of the voltage source.		N/A
	Source voltage (Us)	Max Us: _____ V ☐ac ☐ dc	
		Min Us: _____ V ☐ac ☐dc	
	Adjustable residual current setting	_____ mA (lowest)	
	Adjustable time-delay setting	_____ s	
	Switch off and reclosed Sa or S1 and reduced the source voltage to 70 %	70% Us = _____ V ☐ac ☐ dc	N/A
	Time period to automatic opening		N/A
MII	Test sequence MII		N/A
M.8.14	Verification of the behaviour of the MRCD under short-circuit conditions		N/A
	Type designation or serial number		
	Sample no:		
M.8.14.3	Verification of the rated conditional short-circuit current (I_{cc})		N/A
	Verification of the coordination between the MRCD and the SCPD		
	Test circuit according to figure:		
	Point of test circuit which is directly earthed:		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Grid distance "a" (mm):		
	Silver wire diameter (mm):		
	Used SCPD during the tests		
	Prospective current (A):		
	Prospective current obtained (A):		
	Power factor / ratio *n*:		
	Power factor / ratio *n* obtained:		
	Plot no.		
	Test sequence: O-t-O		
	I^2t (kA^2s); Ip (kA):	First O: Ip :_____kA I^2t; _____kA^2s Plot no. _____	
		Second O: Ip :_____kA I^2t; _____kA^2s Plot no.: _____	
	If tested at separate testing station see report	No.: _____ of _____ testing station	
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		N/A
	After the tests no damage impairing further use		N/A
8.3.3.5	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		N/A
	Test voltage		N/A
B.8.10.3.2	The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting:	I test: _____ mA trip time: ____ ms	N/A
M.8.12.3	Verification of automatic opening in case of voltage source failure		N/A
	Source voltage (Us)	Max Us: _____ V ☐ac ☐ dc	
		Min Us: _____ V ☐ac ☐dc	
	Adjustable residual current setting	_____ mA (lowest)	
	Adjustable time-delay setting	_____ s	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time period	Max 1 s or max. 1 s+time delay setting	
	Time period to automatic opening		N/A
	No value exceeds the relevant specified limiting value		N/A
	The polyethylene sheet shows no holes		N/A
M.8.14.4	Verification of rated short-time withstand current (I_{cw})		N/A
	Test circuit according to figure:		
	Point of test circuit which is directly earthed:		
	Grid distance "a" (mm):		
	Prospective current (A):		
	Prospective current obtained (A):		
	Power factor / ratio *n*:		
	Power factor / ratio *n* obtained:		
	Plot no.		
	Test sequence: O		
	I^2t (kA^2s); Ip (kA):	Ip :_____kA I^2t; _____kA^2s Test duration: _____ms Plot no. _____	
	If tested at separate testing station see report	No.: _____ of _____ testing station _____	
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		N/A
	After the tests no damage impairing further use		N/A
8.3.3.5	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		N/A
	Test voltage	-	N/A
B.8.10.3.2	The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting:	I test: _____ mA trip time: ____ ms	N/A
M.8.12.3	Verification of automatic opening in case of voltage source failure		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Source voltage (Us)	Max Us: _____ V ☐ac ☐ dc	
		Min Us: _____ V ☐ac ☐dc	
	Adjustable residual current setting	_____ mA (lowest)	
	Adjustable time-delay setting	_____ s	
	Time period	Max 1 s or max. 1 s+time delay setting	
	Time period to automatic opening		N/A
	No value exceeds the relevant specified limiting value		N/A
	The polyethylene sheet shows no holes		N/A
M.8.14.5	Verification of the rated conditional residual short-circuit current (IΔc)		N/A
	Test circuit according to figure:		
	Point of test circuit which is directly earthed:		
	Grid distance "a" (mm):		
	Silver wire diameter (mm):		
	Used SCPD during the tests		
	Prospective current (A):		
	Prospective current obtained (A):		
	Power factor / ratio *n*:		
	Power factor / ratio *n* obtained:		
	Plot no.		
	Test sequence: O-t-O		
	I^2t (kA^2s); Ip (kA):	First O: Ip :_____kA I^2t; _____kA^2s Plot no. _____	
		Second O: Ip :_____kA I^2t; _____kA^2s Plot no.: _____	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If tested at separate testing station see report	No.: _____ of _____ testing station _____	
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		N/A
	After the tests no damage impairing further use		N/A
8.3.3.5	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		N/A
	Test voltage	-	N/A
B.8.10.3.2	The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting:	I test: _____ mA trip time: ____ ms	N/A
M.8.12.3	Verification of automatic opening in case of voltage source failure		N/A
	Source voltage (Us)	Max Us: _____ V ☐ac ☐ dc	
		Min Us: _____ V ☐ac ☐dc	
	Adjustable residual current setting	_____ mA (lowest)	
	Adjustable time-delay setting	_____ s	
	Time period	Max 1 s or max. 1 s+time delay setting	
	Time period to automatic opening		N/A
	No value exceeds the relevant specified limiting value		N/A
	The polyethylene sheet shows no holes		N/A
M.8.14.6	Verification of rated residual short-time withstand current (IΔw)		N/A
	Test circuit according to figure:		
	Point of test circuit which is directly earthed:		
	Grid distance "a" (mm):		
	Prospective current (A):		
	Prospective current obtained (A):		
	Power factor / ratio *n*:		
	Power factor / ratio *n* obtained:		
	Plot no.		
	Test sequence: O		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	I^2t (kA^2s); Ip (kA):	Ip :_____kA I^2t; _____kA^2s Test duration: _____ms Plot no. _____	
	If tested at separate testing station see report	No.: _____ of _____ testing station _____	
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		N/A
	After the tests no damage impairing further use		N/A
8.3.3.5	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		N/A
	Test voltage	-	N/A
B.8.10.3.2	The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting:	I test: _____ mA trip time: ____ ms	N/A
M.8.12.3	Verification of automatic opening in case of voltage source failure		N/A
	Source voltage (Us)	Max Us: _____ V ☐ac ☐ dc	
		Min Us: _____ V ☐ac ☐dc	
	Adjustable residual current setting	_____ mA (lowest)	
	Adjustable time-delay setting	_____ s	
	Time period	Max 1 s or max. 1 s+time delay setting	N/A
	Time period to automatic opening		N/A
	No value exceeds the relevant specified limiting value		N/A
	The polyethylene sheet shows no holes		N/A
M.III	Test sequence MIII		N/A
M.8.15	Verification of effects of environmental conditions		N/A
	Type designation or serial number		
	Sample no:		
B.8.10.3.2	The RCCB shall trip with a test current of 1,25 IΔn (ms) in minimum setting:	I test: _____ mA trip time: ____ ms	N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
M.IV	Test sequence MIV		N/A
M.8.16	Verification of electromagnetic compatibility		
	See report		N/A
Annex N	Electromagnetic compatibility (EMC) – Additional requirements and test methods for devices not covered by Annexes B, F and M		
	See report		
Annex O	Instantaneous trip circuit-breakers (ICB)		
O.3.1	Rated current (In)		
O.3.2	Rated short-circuit making capacity		
O.3.3	Rated short-circuit breaking capacities		
	ICBs may be assigned rated short-circuit breaking capacities different to the equivalent circuitbreaker. NOTE ICBs may be assigned a rated short-circuit breaking capacity equal to or greater than *Icu* of the equivalent circuit-breaker when associated with specified motor starters or overload relays, and tested according to the relevant clauses of IEC 60947-4-1 (see O.6.2).		N/A
O.4	Product information		N/A
	An ICB shall be marked according to 5.2 as relevant.		N/A
	Rated short-circuit making and breaking capacities shall be marked, where applicable (see O.6.1.1). When the ICB is only rated for short-circuit performance in association with a motor starter or overload relay (see O.6.2), the short-circuit ratings of the association shall not be marked on the ICB.		N/A
	for 5.2, item a), add the marking "ICB";		N/A
	for 5.2, item b), add the rated instantaneous short-circuit current settings *Ii* (see 2.20) (actual values or multiples of rated current).		N/A
O.5	Constructional and performance requirements		N/A
	An ICB, being derived from the equivalent circuit-breaker (see O.2.1), complies with all the applicable construction and performance requirements of Clause 7, except 7.2.1.2.4, item b).		N/A
O.6	Tests		N/A
O.6.1	O.6.1 Test sequence of the ICB alone		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The tests of this subclause are not required if – the short-circuit characteristics of the short-circuit releases and the main current paths of the ICB are the same as those of the equivalent circuit-breaker, or – the ICB is only rated and tested as an association (see O.6.2).		N/A
O.6.1.2	Test sequences		N/A
	Tests shall be made according to sequences II and III of this standard without the verification of overload releases.		N/A
O.6.1.3	Verification of short-circuit releases		N/A
	Following the test of O.6.1.2, a tripping test is made in accordance with 8.3.3.1.2 on each phase pole in turn, at the maximum setting of the rated instantaneous short-circuit current. The test is made at the value of the tripping current declared by the manufacturer for individual poles . The ICB shall trip.		N/A
O.6.2	ICB associated with a specified protected device (i.e. motor starter or overload relay)		N/A
	The applicable test requirements for these associations are covered in the relevant sections of IEC 60947-4-1, specifically the following clauses: – co-ordination with short-circuit protective devices; – additional requirements for combination starters and protected starters suitable for isolation; – performance under short-circuit conditions; – co-ordination at the crossover current between the starter and associated SCPD. NOTE The symbol SCPD in IEC 60947-4-1 applies to various short-circuit protective devices, including the ICB.		N/A

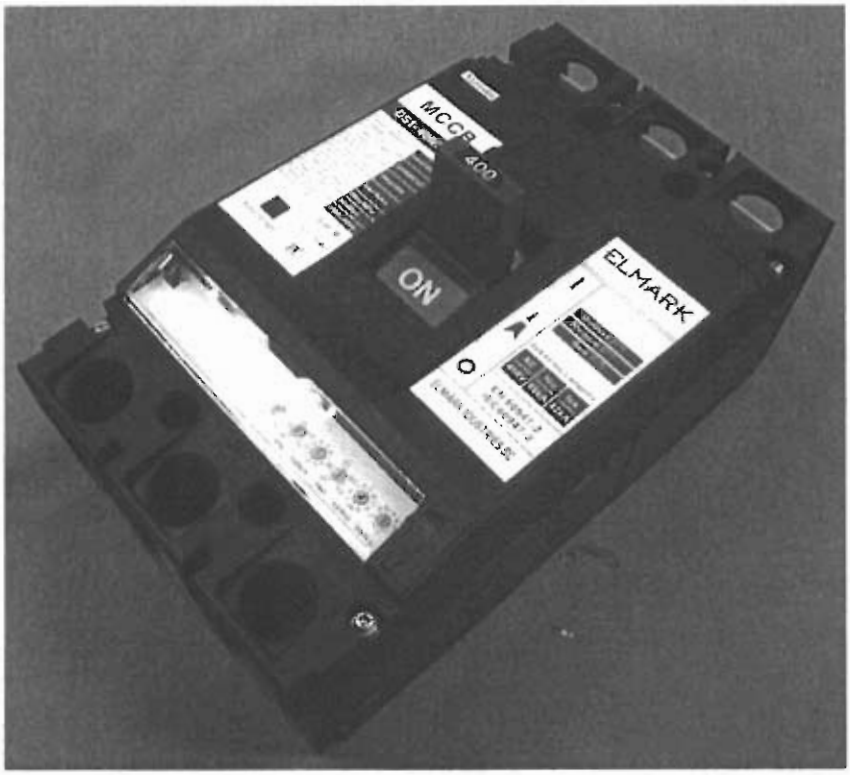
IEC 60947-2

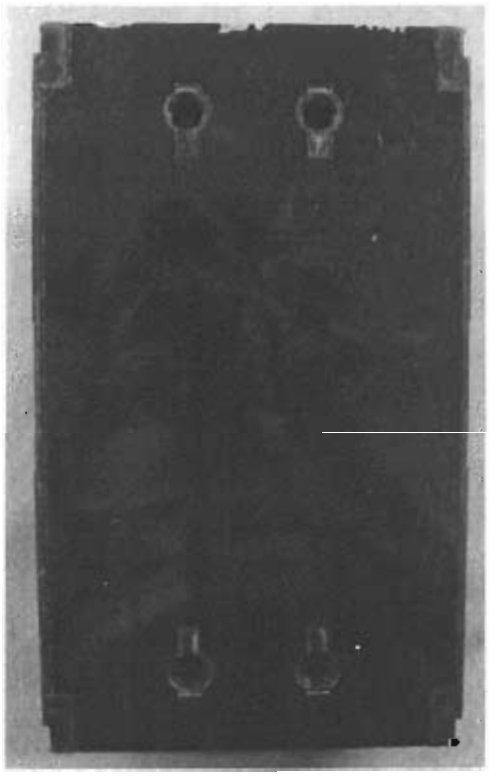
TABLE: Resistance to heat (Ball pressure test)						
no.	Specimen					Verdict
	Description	Colour	Temp. °C	Impress diam. mm	Result diam. mm	
1	Enclosure	Black	125	2,0	1,5	P
2	Handle	blue	70	2,0	1,0	P

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	Black	3	960	5	No	No	P
2	Handle	blue	3	650	-	No	No	P

IEC 60947-2

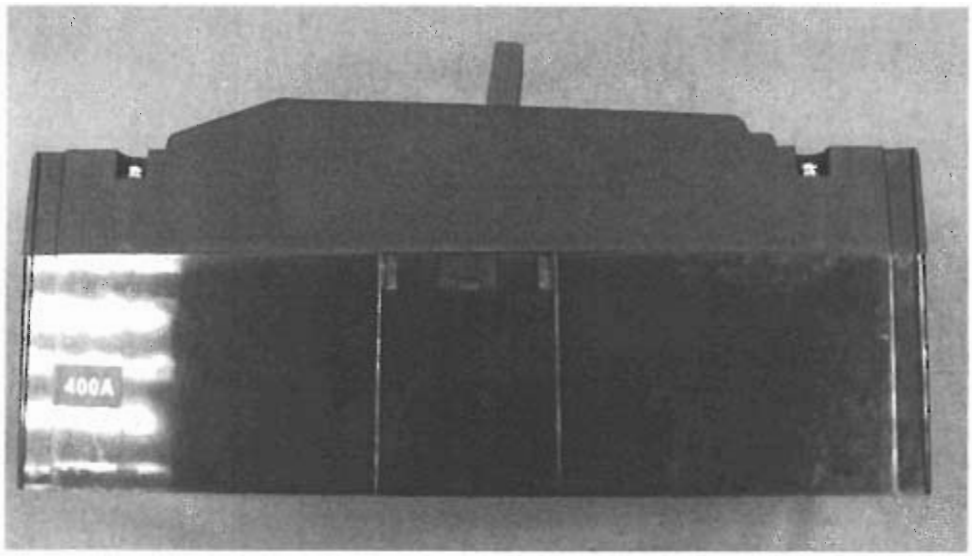
Photos of samples:

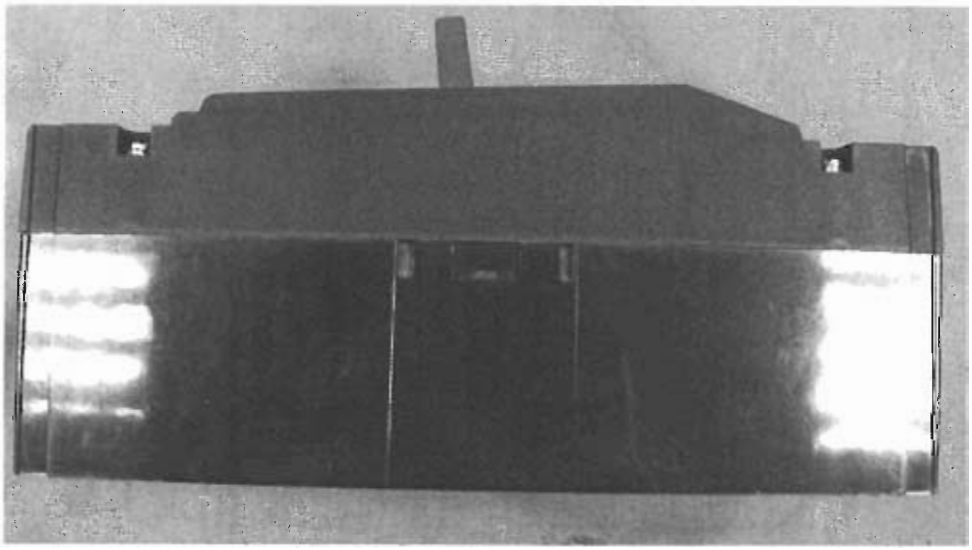




IEC 60947-2

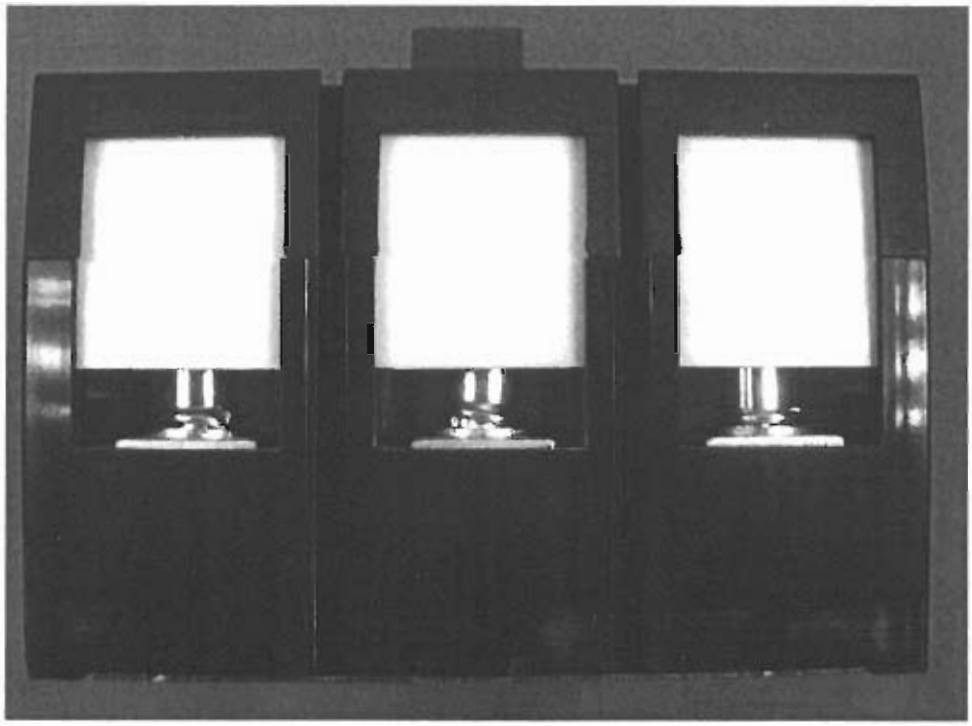
Photos of samples:

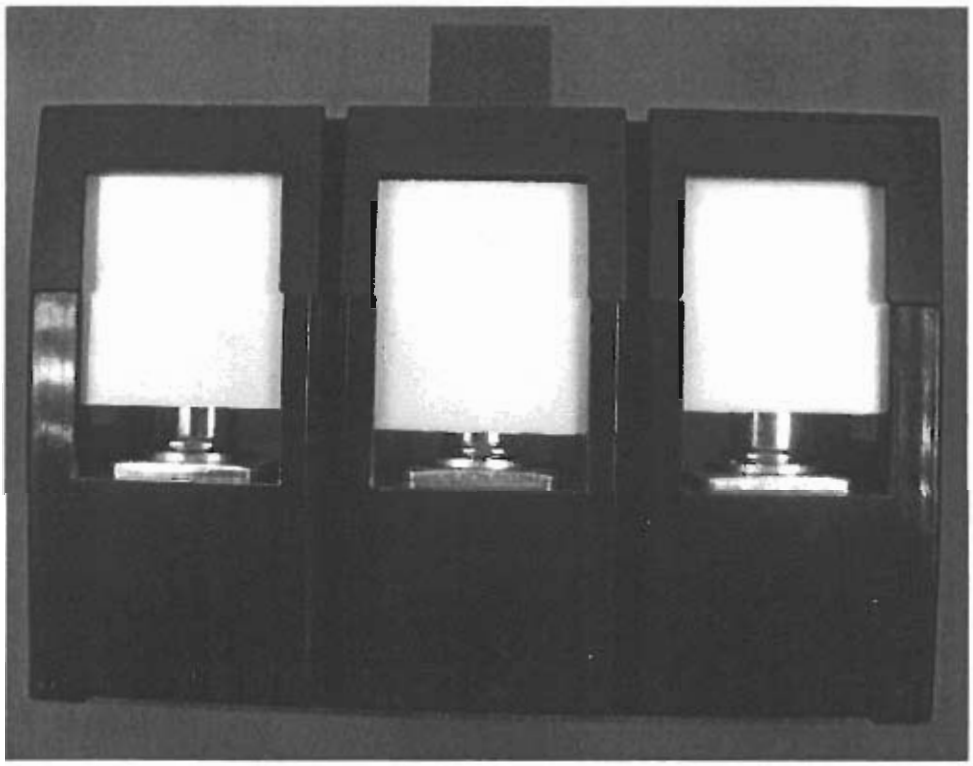




IEC 60947-2

Photos of samples:





IEC 60947-2

Photos of samples: