Test Report issued under the responsibility of:

DEKRA

TEST REPORT
IEC 60947-5-1
Part 5: Control circuit devices and switching elements
Electromechanical control circuit devices

Report Number. ..... :	3314907.52
Date of issue ..... :	2019-03-20
Total number of pages ..... :	49
Name of Testing Laboratory preparing the Report ..... :	DEKRA Testing Services (Zhejiang) Co., Ltd.
Applicant's name ..... :	DELIXI ELECTRIC LTD
Address ..... :	Delixi High-Tech Industrial Park, Liushi Town, Yueqing City 325604 Zhejiang Province, China
Test specification:	
Standard ..... :	IEC 60947-5-1: 2016
Test procedure ..... :	Type test
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60947_5_1E
Test Report Form(s) Originator .... :	DEKRA Certification B.V.
Master TRF ..... :	Dated 2017-10-06

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.

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Test item description..... :	Auxiliary contact
Trade Mark ..... :	HIMEL
Manufacturer..... :	DELIXI ELECTRIC LTD Delixi High-Tech Industrial Park, Liushi Town, Yueqing City 325604 Zhejiang Province, China
Model/Type reference..... :	4NO 4NC
Ratings..... :	4NO and 4NC AC-15: 0,9 A at 400 Vac, 1,5 A at 230 Vac DC-13: 0,27 A at 220 Vdc, 0,55 A at 110 Vdc Ith: 6,0 A

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	DEKRA Testing Services (Zhejiang) Co., Ltd.	
Testing location/ address.....:		No. 5, Changjiang Road, Great Bridge Industrial Park, North Baixiang, Wenzhou, Zhejiang, 325603, China	
Tested by (name, function, signature).....:		Lucky Fan	
Approved by (name, function, signature)...:		King Wang	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment):
N/A

Summary of testing:

Tests performed (name of test and test clause):

No.	Utilization category	Rating	Kind of contact	Test sequence
25#	AC-15	6,0 A	NO / NC	Seq. I[1)]
26#	AC-15	0,9 A at 400 Vac	NO / NC	Seq. II
27#	AC-15	1,5 A at 230 Vac	NO / NC	Seq. II
28#	DC-13	0,27 A at 220 Vdc	NO / NC	Seq. II
29#	DC-13	0,55 A at 110 Vdc	NO / NC	Seq. II
30#	AC-15	0,9 A at 400 Vac	NO / NC	Seq. III
31#	AC-15	1,5 A at 230 Vac	NO / NC	Seq. III
32#	AC-15	0,9 A at 400 Vac	NO / NC	Seq. IV

Note

This report is based on report no. 3314516.52 issued on 2019-03-11, it is issued for new trade mark HIMEL, which is identical in test report no. 3314516.52.
All the test data is taken from report no. 3314516.52.

2. The auxiliary contacts are mounted on the ACB of type HDW3-2000 series, HDW3-3200 series and ACB HDW3-6300 series and work with the ACB together, the test results of temperature rise and dielectric tests are taken over from the ACB HDW3-2000 series in test report no. 3314907.50, ACB HDW3-3200 series in test report no. 3314908.50, ACB HDW3-6300 series in test report no. 3314910.50.

Testing location:

All sequences are conducted in:
Shanghai Testing & Inspection Institute for Electrical Equipment Co., Ltd. (STIEE)
No.505, Wuning Road, Putuo District, Shanghai, China

Summary of compliance with National Differences (List of countries addressed):
N/A

Copy of marking plate:

Test item particulars.....:	
Classification of installation and use.....:	
Supply Connection.....:	
Kind of control circuit device .....:	☐ manual control switches, e.g. push-buttons, rotary switches, foot switches, etc.
	☐ electromagnetically operated control switches, either time delayed or instantaneous, e.g. contactor relays
	☐ pilot switches, e.g. pressure switches, temperature sensitive switches (thermostats)
	☐ position switches
	☒ associated control equipment, e.g. indicator lights, etc.
Kind of switching elements .....:	☒ auxiliary contacts of a switching device (e.g. contactor, circuit-breaker, etc) which are not dedicated exclusively for use with the coil of that device
	☐ interlocking contacts of enclosure doors
	☐ control circuit contacts of rotary switches
	☐ control circuit contacts of overload relays
Number of poles.....:	8 (4 NO and 4 NC)
Kind of current .....:	☒ ac and/or ☐ dc
Interrupting medium .....:	☒ air, ☐ oil, ☐ gas, ☐ vacuum, ☐ ...
Operating conditions .....:	
Method of operations.....:	☐ manual
	☐ electromagnetic
	☐ pneumatic
	☒ electro-pneumatic
Method of control .....:	☒ automatic
	☐ non-automatic
	☐ semi-automatic

Rated and limiting values for switching elements:	
Voltages:	
- rated operational voltage Ue (V) ..... :	AC: 400 V, 230 V DC: 220 V, 110 V
- rated insulation voltage Ui (V) ..... :	690 V
- rated impulse withstand voltage Uimp (kV) ..... :	4 kV
Currents:	
- conventional free air thermal current Ith (A) ..... :	6 A
- conventional enclosed thermal current Ithe (A) ..... :	N/A
- rated operational current Ie (A) ..... :	AC-15: 0,9 A at 400 Vac, 1,5 A at 230 Vac DC-13: 0,27 A at 220 Vdc, 0,55 A at 110 Vdc
Rated frequency (Hz) ..... :	50/60 Hz
Utilization category ..... :	AC-15, DC-13
Short-circuit characteristic:	
- rated conditional short-circuit current (kA) ..... :	1 kA
- kind of protective device ..... :	Fuse: RL1-10, 10 A, 400 Vac, 25 kA
Electrically separated contact elements ..... :	Yes
Actuating quantities for pilot switches ..... :	N/A
Pilot switches having two or more contact elements .. :	N/A
Indication of contact elements of same polarity ..... :	Yes
IP code, in case of an enclosed control device ..... :	N/A
Pollution degree ..... :	3
Suitability for isolation, with the symbol 07-13-06 of IEC 60617-7 ..... :	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..... :	2018-09
Date (s) of performance of tests..... :	2018-09 to 2019-03

General remarks:

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

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

EN 60947-5-1:2017

IEC 60947-1:2007 + A1:2010 + A2:2014

EN 60947-1:2007 + A1:2010 + A2:2014

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....:	☒ **Yes** ☐ **Not applicable**

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

Name and address of factory (ies)..... :	Factoary 1: DELIXI ELECTRIC LTD Delixi High-Tech Industrial Park, Liushi Town, Yueqing City, 325604 Zhejiang Province, China Factoary 2: DELIXI ELECTRIC (WUHU) LTD Wuhu Machinery Industrial Park, Wuhu city, 241100, Anhui Province, China

General product information:

Auxiliary contact
For technical data, please refer to page 6 to 7 of this report.

Auxiliary contact is used in ACB HDW3-2000 series, ACB HDW3-3200 series and ACB HDW3-6300 series.

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict

5	PRODUCT INFORMATION		
5.2	Marking		P
	Data shall be preferably marked on the equipment:		
	a - manufacturer's name or trademark	HIMEL	P
	b - type designation or serial number	4NO 4NC	P
	Data shall be included on the nameplate, or on the equipment, or in the manufacturer's published literature:		
	c - number of this standard	IEC 60947-5-1	P
	d - rated operational voltages	AC: 400 V, 230 V DC: 220 V, 100 V	P
	e - utilization category and rated operational currents, at the rated operational voltages of the control circuit device	AC-15: 0,9 A at 400 Vac, 1,5 A at 230 Vac DC-13: 0,27 A at 220 Vdc, 0,55 A at 110 Vdc	P
	f - rated insulation voltage:	690 V	P
	g - rated impulse withstand voltage	4 kV	P
	h - vacant		N/A
	i - IP code, in case of enclosed control circuit device		N/A
	j - pollution degree	3	P
	k - type and maximum ratings of short-circuit protective device	RL1-10, 10 A, 400 Vac, 25 kA	P
	l - conditional short-circuit current	1 kA	P
	m - suitability for isolation, where applicable, with the symbol S00288 of IEC 60617		N/A
	n - indication of contact elements of same polarity		N/A
	Marking of data under n) shall be included on the nameplate of the control circuit device in order to ensure proper wiring at installation.		N/A
	o) length of insulation to be removed before insertion of the conductor into the terminal.		P
	p) for non-universal screwless terminals: – “s” or "sol" for terminals declared for rigid-solid conductors; – "r" for terminals declared for rigid (solid and stranded) conductors; – "f" for terminals declared for flexible conductors.		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The indication "s", "sol", "r" or "f" for non-universal screwless terminals shall be marked on the device or, if the space available is not sufficient, on the smallest package unit or in technical information provided with the product.		N/A
5.2.2	Terminal identification and marking (see 7.1.8.4 of IEC 60947-1)		P
	Clearly and permanently identified according IEC 60445 and Annex L, unless superseded by relevant standard.		P
	Neutral terminal identified by letter .... :		N/A
	Protective earth terminal identified by letter		N/A
5.2.3	Functional markings		N/A
	Actuators may be identified by symbols in the form of engravings, but if a stop button carries any symbol engraved or marked this symbol shall be a circle or oval		N/A
	Letters or words may used where space is available		N/A
	Symbols shall be in accordance with IEC 60417		N/A
5.2.4	Emergency stop		N/A
	Actuator shape and colour, background colour and direction of unlatching for emergency stop devices with mechanical latching function shall be in accordance with 4.2 of IEC 60947-5-5		N/A
5.2.5	Operating diagram		N/A
5.2.5.1	General		N/A
	As rotary switches may have multiplicity of contacts elements and a multiplicity of actuator positions, it necessary that the manufacturer indicates the relationship between the actuator positions and the associated contact elements position		N/A
5.2.5.2	Position indication and contact position		N/A
	Sub clause 7.1.6.1 of IEC 60947-1 applies		N/A
	The position indication shall be clear, and the associated text or symbols shall be indelible and easily legible		N/A
5.2.5.3	Terminal markings for operating diagrams		N/A
	Terminal markings shall be clearly identifiable with respect to the operating diagram (see also Annex M)		N/A
5.2.6	Time delay markings		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The manufacturer shall indicate, for each time-delay contact element, the characteristic of the delay, according to 2.4.1.1 or 2.4.1.2		N/A
5.3	Instructions for installation, operation and maintenance		P
	The manufacture shall specify, in his documents or catalogues:		P
	- the conditions for installation, operation and maintenance, if any, of the equipment during operation and after a fault		P
	- the specify the measures to be taken with regard to EMC, if any,		N/A
	- equipment only suitable in environment A shall provided with the following notice	..... This product has been designed for environment B may cause unwanted electromagnetic disturbances in which case the user may be required to take adequate mitigation measures.	N/A
	- if necessary, the instructions for transport, installation and operation of the equipment shall indicate the measures that are particular importance for the proper and correct installation, commissioning and operation of the equipment.		P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
6	**Normal service, mounting and transport conditions**		
6.1.1	Ambient temperature		
	Ambient air temperature does not exceed +40 °C and its average over 24 hours does not exceed +35°C and the lower limit is –5°C		P
6.1.2	Altitude		
	Altitude of side of installation does not exceed 2000m		P
6.1.3	Atmospheric conditions		
6.1.3.1	Relative humidity does not exceed 50 % at max temp +40 °C, higher rel. hum may at lower temperatures e.g. 90% at +20 °C		P
6.1.3.2	Pollution degree		
	Unless otherwise stated, equipment for: - industrial use shall have a degree 3, depending upon micro-environment - household and similar shall have degree 2		P
6.1.4	Shock and vibration		
	Under consideration		
6.2	Conditions during transport and storage		
	Under consideration		
6.3	Mounting		
	According manufacturer's instruction		P
6.3.1	Mounting of single hole mounted devices		
	Dimensions according Table 2		N/A
6.3.1.1	Location of key recess (if any)		
	Dimensions according Table 3		N/A
6.3.1.2	Range of panel thickness		
	The device shall be capable of being mounted on any thickness between 1 and 6 mm		N/A
6.3.1.3	Grouping of devices		
	The distances a between the mounting centres in the same row and b between the centre lines of the rows shall be not less than those given in table 3. Distances a and b may be interchanged		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
7	**CONSTRUCTIONAL AND PERFORMANCE REQUIREMENTS**		
7.1	Constructional requirements		
7.1.1	General		
	Sub clause 7.1 of IEC 60947-1 applies except for 7.1.2, 7.1.3, 7.1.7, 7.1.9 and 7.1.13, and with the following additions:		P
7.1.2	Materials		
7.1.2.2	Glow-wire testing		
		See TABLE 1	P
7.1.2.3	Test based on flammability category		
			N/A
7.1.3	Current-carrying parts and their connection		
	No contact pressure through insulating materials		P
7.1.4	Clearances and creepage distances		
	Clause 7.1.4 of IEC 60947-1 applies		
	Clearances		
	Minimum values are given in Table 13 and Table 15 of IEC 60947-1		
	Rated impulse withstand voltage	4 kV	
	Minimum clearance - Case B (mm)		
	Minimum clearance - Case A (mm)	Required: 3 mm	
	Measured clearances (mm) ..... :	Measured: 12,5 mm	P
	Creepage distances		
	Pollution degree ..... :	3	
	Comparative tracking index (V) ..... :	275 V	
	Material group ..... :	IIIa	
	Rated insulation voltage Ui (V) ..... :	690 V	
	Minimum creepage distances (mm) ..... :	Required: 10 mm	
	Measured creepage distances (mm) ..... :	Measured: 20,4 mm	P
7.1.5	Actuator		
7.1.5.1	Insulation		
	Clause 7.1.5.1 of IEC 60947-1 applies		N/A
7.1.5.2	Direction		
	Clause 7.1.5.2 of IEC 60947-1 applies		N/A
7.1.5.3	Actuating force (or moment)		

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Clause	Requirement + Test	Result - Remark	Verdict
			N/A
7.1.5.4	Limitation of rotation (of rotary switch)		
	When actuators with limited or unidirectional movement are used, they shall be fitted with robust means of limitation, capable of withstanding five times the actual maximum actuating moment.		N/A
7.1.5.5	Emergency stop		
	The actuator shall preferably latch in the actuated position with the control contact open. This latching shall be released by a separate action, e.g. by pulling, rotation, or by means of a key.		N/A
7.1.6	Indication of the contact position		
	Clause 7.1.6 of IEC 60947-1 applies		N/A
7.1.7	Conditions for control switches suitable for isolation		
	A control switch suitable for isolation shall be manually operated with a direct opening action (see Annex K) and shall comply with the isolating function in the open position (see 2.1.19 and 7.1.7 of IEC 60947-1).		N/A
	The open position of a control switch suitable for isolation shall be a position in which the switch can remain when no actuating force is applied.		N/A
	In order to avoid unintentional reclosing, it shall be possible to prevent the operation of the control switches suitable for isolation when the contact elements are in the open position. This may be obtained by padlocking or by a latch which shall only be releasable by a special tool or key.		N/A
7.1.8	Terminals		
		See clause 8.2.4	P
7.1.10	Provisions for protective earthing		
	Clause 7.1.10 of IEC 60947-1 applies		N/A
7.1.11	Enclosures for equipment		
	Clause 7.1.11 of IEC 60947-1 applies		N/A
7.1.12	Degree of protection of enclosed equipment		
	Degree of protection ..... :		
	Test for first characteristic		

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Clause	Requirement + Test	Result - Remark	Verdict
	Test for first numeral ..... :	☐ 1: ☐ 2: ☐ 3: ☐ 4: ☐ 5: ☐ 6:	N/A
	Test for second characteristic		
	Test for second numeral ..... :	☐ 1: ☐ 2: ☐ 3: ☐ 4: ☐ 5: ☐ 6: ☐ 7: ☐ 8:	N/A
7.1.14	Class II control circuit devices		
	These devices shall not be provided with means for protective earthing (see IEC 61140)		N/A
	For class II control circuit devices insulated by encapsulation, see Annex F	See annex F	N/A
7.1.15	Requirements for control devices with integrally connected cables		
		See annex G	N/A
7.2	Performance requirements		
	Subclauses 7.2.1.1 and 7.2.2 of IEC 60947-1 apply with the following additions:		P
7.2.1.2	Limits of operation of contactor relays		
	The limits of operation for contactor relays shall be in accordance with IEC 60947-4-1	See clause 8.3.3.2	N/A
7.2.3	Dielectric properties		
	Subclause 7.2.3 of IEC 60947-1 applies with the following addition	See clause 8.3.3.4	P
	For class II control circuit devices insulated by encapsulation	See Annex F	N/A
7.2.4	Ability to make and break under normal and abnormal load conditions		
7.2.4.1	Making and breaking capacities		
	Making and breaking capacities under normal conditions as state in table 4	See clause 8.3.3.5.2	P
	Making and breaking capacities under abnormal conditions as state in table 5	See clause 8.3.3.5.3	P
7.2.4.3	Durability		

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Clause	Requirement + Test	Result - Remark	Verdict
	Sub-clause 7.2.4.3 of IEC 60947-1 applies with the following additions:		
	Mechanical durability	See Annex C	N/A
	Electrical durability	See Annex C	N/A
7.2.5	Conditional short-circuit current		
	The switching element shall withstand the stresses resulting from short-circuit current under the conditions specified in 8.3.4		P
7.2.7	Additional requirements for control switches suitable for isolation		
	Control switches suitable for isolation shall be tested according to 8.3.3.4 of IEC 60947-1 with a value of test voltage as specified in Table 14 or IEC 60947-1 corresponding to the rated impulse withstand voltage Uimp declared by the manufacturer.		N/A
	Other additional requirements applicable to such control switches are under consideration		
7.2.8	Maximum recovery time		
	For equipment incorporating electronic circuits the maximum recovery time and the measuring method shall be stated by the manufacturer		N/A
7.3	Electromagnetic compatibility (EMC)		
	Subclause 7.3 of IEC 60947-1 applies with the following additions:		N/A
	The control circuit device to be tested shall have all the essential design details of the type which it represents and shall be in a clean and new condition.		N/A
	The EMC tests shall be conducted at rated operational voltage Ue, or if the rated operational voltage is given as a range, then the test shall be conducted at a voltage which represents the worst case condition.		N/A
	Maintenance or replacement of parts during or after a testing cycle is not permitted.		N/A
	The products covered by this standard are intended for use in environment A.		N/A
	Contactor relays incorporating electronic circuits shall follow the requirements of 8.3.2.2 of IEC 60947-4-1		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE I (sample No. 25#)		
Test No. 1	- operating limits of contactor relays (8.3.3.2)		
Test No. 2	- temperature rise (Clause 8.3.3.3.)		
Test No. 3	- dielectric properties (Clause 8.3.3.4)		
Test No. 4	- mechanical properties of terminals (8.2.4 of IEC 60947-1)		
8.3.3.2	Operating limits of contactor relays		
9.3.3.2.1	Power-operated equipment:		
8.2.1.2.1	Electromagnetic contactors and starters		
	rated control supply voltage Us (V) ..... :		
	frequency (Hz) ..... :		
	declared ambient temperature(>40 °C) for 100% Us		
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us ..... :		N/A
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. ..... :		N/A
	ambient temperature(-5 °C) for 100% Us		
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us ..... :		N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. ..... :		N/A
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		
	Rated control supply voltage Us (V) ..... :		
	Frequency (Hz) ..... :		
	Declared ambient temperature(>40 °C) for 100% Us		
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us . :		N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. ..... :		N/A
	Ambient temperature(-5 °C) for 100% Us		
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us . :		N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. ..... :		N/A
8.2.1.2.3	Electro-pneumatic contactors and starters		
	Rated air supply pressure(Bar) ..... :		

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Clause	Requirement + Test	Result - Remark	Verdict
	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure(Bar)		
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar) .. :		N/A
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar) ..... :		N/A
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)		
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar) .. :		N/A
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) ..... :		N/A
8.3.3.3	Temperature rise		
	ambient temperature 10-40 °C ..... :	21 °C	
	test enclosure W x H x D (mm x mm x mm) ..... :	-	
	material of enclosure ..... :	-	
	NO-contacts, test conditions:		P
	- rated operational current Ie (A) ..... :	6 A	P
	- cable cross-section (mm²) ..... :	1,0 mm^2	P
	- temperature rise of NO terminals (K) ..... :	Max 13 K, tested with ACB 2000 A in test report no. 3314907.50	P
	NC-contacts, test conditions:		P
	- rated operational current Ie (A) ..... :	6 A	P
	- cable cross-section (mm²) ..... :	1,0 mm^2	P
	- temperature rise of NC terminals (K) ..... :	Max 16 K, tested with ACB 2000 A in test report no. 3314907.50	P
	Coils and electromagnets, test conditions:		
	- rated control supply voltage Us (V / Hz) ..... :		N/A
	- Class of insulating material ..... :		N/A
	- temperature rise of coil and electromagnets (K) ... :		N/A
8.3.3.4	Dielectric properties		
	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
	- verification by measurement of clearances instead of testing		N/A
	- rated impulse withstand voltage (V) ..... :	4 kV	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- test Uimp auxiliary circuits (kV) ..... :	4,8 kV, tested with ACB HDW3-2000 series in test report no. 3314907.50, ACB HDW3-3200 series in test report no. 3314908.50 ACB HDW3-6300 series in test report no. 3314910.50	P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) ..... :	690 V	P
	- control and auxiliary circuits, test voltage (V) for 60 sec ..... :	1890 V, tested with ACB HDW3-2000 series in test report no. 3314907.50, ACB HDW3-3200 series in test report no. 3314908.50 ACB HDW3-6300 series in test report no. 3314910.50	P
8.2.4	Mechanical and electrical properties of terminals		
8.2.4.2	Mechanical strength of terminals		
	maximum cross-sectional area of conductor (mm²) :	2,5 mm^2	P
	diameter of thread (mm) ..... :	4 mm	P
	torque (Nm) ..... :	1,1 x 1,2 Nm = 1,32 Nm	P
	5 times on 2 separate clamping units		P
8.2.4.3	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm²) ..... :	1 mm^2	P
	number of conductor of the smallest cross section . :	1	P
	diameter of bushing hole (mm) ..... :	6,5 mm	P
	height between the equipment and the platen (mm) ..... :	260 mm	P
	mass at the conductor(s) (kg) ..... :	0,4 kg	P
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
8.2.4.4	Pull-out test		
	force (N) ..... :	35 N	P
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
8.2.4.3	Flexion test		
	conductor of the largest cross-sectional area (mm²) :	2,5 mm^2	P
	number of conductor of the largest cross-section ... :	1	P

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Clause	Requirement + Test	Result - Remark	Verdict
	diameter of bushing hole (mm) ..... :	9,5 mm	P
	height between the equipment and the platen (mm) ..... :	280 mm	P
	mass at the conductor(s) (kg) ..... :	0,7 kg	P
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
8.2.4.4	Pull-out test		
	force (N) ..... :	50 N	P
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
8.2.4.3	Flexion test		
	conductor of the largest and smallest cross-sectional area (mm²) ..... :		N/A
	number of conductor of the smallest cross sectional, number of conductor of the largest cross sectional . :		N/A
	diameter of bushing hole (mm) ..... :		N/A
	height between the equipment and the platen (mm) ..... :		N/A
	mass at the conductor(s) (kg) ..... :		N/A
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
8.2.4.4	Pull-out test		
	force (N) ..... :		N/A
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
8.2.4.5	Test for insertability of unprepared round copper conductors having the maximum cross-section		
	The test shall be carried out using the appropriate gauge form A or form B specified in Table 7.		P
	The measuring section of the gauge shall be able to penetrate freely into the terminal aperture to the full depth of the terminal (see also note to Table 7).		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Alternatively, the test can be carried out by inserting the largest conductor of type and rated cross-section among those recommended by the manufacturer, the diameter of which corresponds to the theoretical diameter according to Table 7a, after the insulation has been removed and the end has been reshaped. The stripped end of the conductor shall be able to enter completely within the clamping unit aperture, without use of undue force.		P
8.2.4.7	Electrical performance of screwless-type clamping units		
	If terminals are used which are qualified according to IEC 60999-1 and the operating conditions of the terminals in the device are according to the operating conditions specified by the manufacturer of the terminals, then the test does not need to be performed.		N/A
	Sub clause 8.2.4.7 of IEC 60947-1 applies with the following changes:		N/A
	– The test shall be done on the connecting device equipped with the clamping units; – The number of specimens shall be at least 8; – The test shall be done as a single 8 test: • Eight clamping units shall be tested to the declared voltage drop; • If the number of failed clamping units does not exceed two, the test is considered passed.		N/A
	test current (A) ..... :		N/A
	voltage drop ＜ 15 mV. (V)..... :		N/A
8.2.4.8	Ageing test for screwless-type clamping units		
	If terminals are used which are qualified according to IEC 60999-1 and the operating conditions of the terminals in the device are according to the operating conditions specified by the manufacturer of the terminals, then the test does not need to be performed.		N/A
	Subclause 8.2.4.8 of IEC 60947-1 applies with the following changes:		N/A
	The test shall be done on the connecting device equipped with the clamping units.		N/A
	test current (A) ..... :		N/A
	maximum temperature for the temperature cycles shall be 40°C. Max. temperature (°C) ..... :		N/A
	voltage drop ≤ 22,5 mV or 1,5 times the value measured after the 24th cycle. (V) ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TEST SEQUENCE II (sample No.26#, test on NO contact)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	AC-15	
	rated operational voltage Ue (V) ..... :	400 Vac	
	rated operational current Ie (A) or power (kW) ..... :	0,9 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	442 Vac	P
	- power factor/time constant ..... :	0,27 for making 0,29 for breaking	P
	- make operations: test current I/Ie (A) ..... :	10,1 A	P
	- break operations: test current I/Ie (A) ..... :	1,01 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 308 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	405 Vac	P
	- power factor/time constant ..... :	0,27 for making 0,29 for breaking	P
	- make operations: test current I/Ie (A) ..... :	9,08 A	P
	- break operations: test current I/Ie (A) ..... :	0,91 A	P
No. 2	- on-time (ms) ..... :	Min 310 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	Min 312 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P

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Clause	Requirement + Test	Result - Remark	Verdict
No. 4	- on-time (ms) .....:	Min 311 ms	P
	- operating cycles per minute .....:	6	P
	- number of operating cycles .....:	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V:	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TEST SEQUENCE II (sample No.26#, test on NC contact)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	AC-15	
	rated operational voltage Ue (V) ..... :	400 Vac	
	rated operational current Ie (A) or power (kW) ..... :	0,9 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	442 Vac	P
	- power factor/time constant ..... :	0,27 for making 0,29 for breaking	P
	- make operations: test current I/Ie (A) ..... :	10,1 A	P
	- break operations: test current I/Ie (A) ..... :	1,01 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 307 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	405 Vac for making	P
	- power factor/time constant ..... :	0,27 for making 0,29 for breaking	P
	- make operations: test current I/Ie (A) ..... :	9,08 A	P
	- break operations: test current I/Ie (A) ..... :	0,91 A	P
No. 2	- on-time (ms) ..... :	Min 309 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	Min 311 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P

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Clause	Requirement + Test	Result - Remark	Verdict
No. 4	- on-time (ms) .....:	Min 310 ms	P
	- operating cycles per minute .....:	6	P
	- number of operating cycles .....:	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V:	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TEST SEQUENCE II (sample No.27#, test on NO contact)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	AC-15	
	rated operational voltage Ue (V) ..... :	230 Vac	
	rated operational current Ie (A) or power (kW) ..... :	1,5 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	254 Vac	P
	- power factor/time constant ..... :	0,27 for making 0,30 for breaking	P
	- make operations: test current I/Ie (A) ..... :	16,3 A	P
	- break operations: test current I/Ie (A) ..... :	1,63 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 315 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	231 Vac	P
	- power factor/time constant ..... :	0,27 for making 0,30 for breaking	P
	- make operations: test current I/Ie (A) ..... :	15,2 A	P
	- break operations: test current I/Ie (A) ..... :	1.52 A	P
No. 2	- on-time (ms) ..... :	Min 310 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	Min 312 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P

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Clause	Requirement + Test	Result - Remark	Verdict
No. 4	- on-time (ms) .....:	Min 310 ms	P
	- operating cycles per minute .....:	6	P
	- number of operating cycles .....:	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V:	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TEST SEQUENCE II (sample No.27#, test on NC contact)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	AC-15	
	rated operational voltage Ue (V) ..... :	230 Vac	
	rated operational current Ie (A) or power (kW) ..... :	1,5 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	254 Vac	P
	- power factor/time constant ..... :	0,27 for making 0,30 for breaking	P
	- make operations: test current I/Ie (A) ..... :	16,3 A	P
	- break operations: test current I/Ie (A) ..... :	1,63 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 316 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	231 Vac	P
	- power factor/time constant ..... :	0,27 for making 0,30 for breaking	P
	- make operations: test current I/Ie (A) ..... :	15,2 A	P
	- break operations: test current I/Ie (A) ..... :	1.52 A	P
No. 2	- on-time (ms) ..... :	Min 314 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	Min 310 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P

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Clause	Requirement + Test	Result - Remark	Verdict
No. 4	- on-time (ms) .....:	Min 311 ms	P
	- operating cycles per minute .....:	6	P
	- number of operating cycles .....:	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V:	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE II (sample No.28#, test on NO contact)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	DC-13	
	rated operational voltage Ue (V) ..... :	220 Vdc	
	rated operational current Ie (A) or power (kW) ..... :	0,27 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	241 Vdc	P
	- power factor/time constant ..... :	315 ms	P
	- make operations: test current I/Ie (A) ..... :	0,303 A	P
	- break operations: test current I/Ie (A) ..... :	0,303 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 411 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V)	223 Vdc	P
	- power factor/time constant ..... :	315 ms	P
	- make operations: test current I/Ie (A) ..... :	0,275 A	P
	- break operations: test current I/Ie (A) ..... :	0,275 A	P
No. 2	- on-time (ms) ..... :	Min 408 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	Min 413 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	Min 412 ms	P
	- operating cycles per minute ..... :	6	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- number of operating cycles .....:	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V:	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE II (sample No.28#, test on NC contact)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	DC-13	
	rated operational voltage Ue (V) ..... :	220 Vdc	
	rated operational current Ie (A) or power (kW) ..... :	0,27 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	241 Vdc	P
	- power factor/time constant ..... :	315 ms	P
	- make operations: test current I/Ie (A) ..... :	0,303 A	P
	- break operations: test current I/Ie (A) ..... :	0,303 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 410 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V)	223 Vdc	P
	- power factor/time constant ..... :	315 ms	P
	- make operations: test current I/Ie (A) ..... :	0,275 A	P
	- break operations: test current I/Ie (A) ..... :	0,275 A	P
No. 2	- on-time (ms) ..... :	Min 408 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	Min 413 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	Min 412 ms	P
	- operating cycles per minute ..... :	6	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- number of operating cycles .....:	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V:	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE II (sample No.29#, test on NO contact)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	DC-13	
	rated operational voltage Ue (V) ..... :	110 Vdc	
	rated operational current Ie (A) or power (kW) ..... :	0,55 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	122 Vdc	P
	- power factor/time constant ..... :	307 ms	P
	- make operations: test current I/Ie (A) ..... :	0,611 A	P
	- break operations: test current I/Ie (A) ..... :	0,611 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 405 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V)	111 Vdc	P
	- power factor/time constant ..... :	307 ms	P
	- make operations: test current I/Ie (A) ..... :	0,555 A	P
	- break operations: test current I/Ie (A) ..... :	0,555 A	P
No. 2	- on-time (ms) ..... :	Min 403 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	Min 401 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	Min 402 ms	P
	- operating cycles per minute ..... :	6	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- number of operating cycles .....:	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V:	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE II (sample No.29#, test on NC contact)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	DC-13	
	rated operational voltage Ue (V) ..... :	110 Vdc	
	rated operational current Ie (A) or power (kW) ..... :	0,55 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	122 Vdc	P
	- power factor/time constant ..... :	307 ms	P
	- make operations: test current I/Ie (A) ..... :	0,611 A	P
	- break operations: test current I/Ie (A) ..... :	0,611 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 399 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V)	111 Vdc	P
	- power factor/time constant ..... :	307 ms	P
	- make operations: test current I/Ie (A) ..... :	0,555 A	P
	- break operations: test current I/Ie (A) ..... :	0,555 A	P
No. 2	- on-time (ms) ..... :	Min 405 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	Min 404 ms	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	Min 402 ms	P
	- operating cycles per minute ..... :	6	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- number of operating cycles .....:	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V:	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE III (sample No. 30#, test on NO contact)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (8.3.3.5.4)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	AC-15	
	rated operational voltage Ue (V) ..... :	400 Vac	
	rated operational current Ie (A) or power (kW) ..... :	0,9 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	441 Vac	P
	- power factor/time constant ..... :	0,32	P
	- make operations: test current I/Ie (A) ..... :	9,11 A	P
	- break operations: test current I/Ie (A) ..... :	9,11 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 180 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V.. :	1000 V / 60 s	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE III (sample No. 30#, test on NC contact)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (8.3.3.5.4)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	AC-15	
	rated operational voltage Ue (V) ..... :	400 Vac	
	rated operational current Ie (A) or power (kW) ..... :	0,9 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	441 Vac	P
	- power factor/time constant ..... :	0,32	P
	- make operations: test current I/Ie (A) ..... :	9,11 A	P
	- break operations: test current I/Ie (A) ..... :	9,11 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 182 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V.. :	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE III (sample No. 31#, test on NO contact)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (8.3.3.5.4)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	AC-15	
	rated operational voltage Ue (V) ..... :	230 Vac	
	rated operational current Ie (A) or power (kW) ..... :	1,5 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	255 Vac	P
	- power factor/time constant ..... :	0,32	P
	- make operations: test current I/Ie (A) ..... :	15,3 A	P
	- break operations: test current I/Ie (A) ..... :	15,3 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 199 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V.. :	1000 V / 60 s	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.1	TEST SEQUENCE III (sample No. 31#, test on NC contact)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (8.3.3.5.4)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	4d) / Za	
	contact polarity ..... :	Same polarity	
	utilization category (AC / DC) ..... :	AC-15	
	rated operational voltage Ue (V) ..... :	230 Vac	
	rated operational current Ie (A) or power (kW) ..... :	1,5 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	255 Vac	P
	- power factor/time constant ..... :	0,32	P
	- make operations: test current I/Ie (A) ..... :	15,3 A	P
	- break operations: test current I/Ie (A) ..... :	15,3 A	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	Min 199 ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V.. :	1000 V / 60 s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TEST SEQUENCE IV (sample No. 32#, test on NO contact)		
Test No. 1	- Performance under conditional short-circuit current (8.3.4)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.4	Performance under conditional short-circuit current		
	contact element (figure / form) .....:	4d) / Za	
	contact polarity.....:	Same polarity	
	type of SCPD .....:	RL1-10	
	ratings of SCPD (A / V).....:	10 A	
	prospective current (kA).....:	1 kA	
	test voltage (V) U/Ue = 1,1 (V) .....:	440 Vac	P
	r.m.s. test current obtained (kA) .....:	1,02 kA	P
	power factor (max. 0,7) .....:	0,58	P
	first CO operation by closing the separate making switch: test Ip / I²dt (kA / kA²s) .....:	244 A / 207 A^2s	P
	time interval between test (min. 3 min) .....:	3 min	P
	second CO operation by closing the separate making switch: test Ip / I²dt (kA / kA²s) .....:	259 A / 204 A^2s	P
	time interval between test (min. 3 min) .....:	3 min	P
	third making operation to closed switching elements: test Ip / I²dt (kA / kA²s) .....:	349 A / 450 A^2s	P
	Behaviour of the equipment during the test:		
	switching elements open by the normal actuating system		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V..:	1000 V / 60 s	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TEST SEQUENCE IV (sample No. 32#, test on NC contact)		
Test No. 1	- Performance under conditional short-circuit current (8.3.4)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
8.3.4	Performance under conditional short-circuit current		
	contact element (figure / form) .....:	4d) / Za	
	contact polarity.....:	Same polarity	
	type of SCPD .....:	RL1-10	
	ratings of SCPD (A / V).....:	10 A	
	prospective current (kA).....:	1 kA	
	test voltage (V) U/Ue = 1,1 (V) .....:	440 Vac	P
	r.m.s. test current obtained (kA) .....:	1,02 kA	P
	power factor (max. 0,7) .....:	0,58	P
	first CO operation by closing the separate making switch: test Ip / I²dt (kA / kA²s) .....:	291 A / 134 A^2s	P
	time interval between test (min. 3 min) .....:	3 min	P
	second CO operation by closing the separate making switch: test Ip / I²dt (kA / kA²s) .....:	279 A / 143 A^2s	P
	time interval between test (min. 3 min) .....:	3 min	P
	third making operation to closed switching elements: test Ip / I²dt (kA / kA²s) .....:	292 A / 119 A^2s	P
	Behaviour of the equipment during the test:		
	switching elements open by the normal actuating system		P
8.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V..:	1000 V / 60 s	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TEST SEQUENCE V	N/A
Test No. 1	- Degree of protection of enclosed control circuit-devices (Annex C of IEC 60947-1)	N/A
Test No. 2	- Verification of actuation force or moment (8.2.5)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1.	TEST SEQUENCE VI (sample No. 25#)		
Test No. 1	- Measurement of clearances and creepage distances (7.1.4 of IEC 60947-1)		
Test No. 2	- Verification of limitation of rotation of a rotary switch (8.2.6)		
7.1.4	Measurement of clearances and creepage distances		
	Clearances and creepage distances	See clause 7.1.4 See TABLE 2	P
	Verification of limitation of rotation of a rotary switch (8.2.6)		N/A
8.2.6	Verification of limitation of rotation of a rotary switch		
	When this test is required in 7.1.4.5, it shall be tested during sequence VI of 8.3.1 The test sample shall be mounted according to the manufacturer's instructions		N/A
7.1.4.5	Limitation of rotation (of a rotary switch)		
	When actuators with limited or unidirectional movement are used, they shall be fitted with robust means of limitation, capable of withstanding five times the actual maximum actuating moment		N/A
8.2.6	The operating moment shall be measured five times and the maximum value recorded (Nm)..... :		N/A
	The maximum moment value, multiplied by five, shall be applied to the actuator by forcing it against the means of limitation. The moment shall be applied for 10 s (Nm) ..... :		N/A
	Means of limitation has not moved, become loose or prevented the actuator's normal operation		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.4	**TEST FOR EMC**		N/A
Annex C of IEC 60947-1	**DEGREE OF PROTECTION OF ENCLOSED CONTROL CIRCUIT-DEVICES**		N/A
Annex C	**SPECIAL TESTS - DURABILITY TESTS**		N/A
Annex E	**ITEMS SUBJECT TO AGREE BETWEEN MANUFACTURER AND USER**		N/A
Annex F	**CLASS II CONTROL CIRCUIT DEVICES INSULATED BY ENCAPSULATION REQUIREMENTS AND TESTS**		N/A
Annex G	**ADDITIONAL REQUIREMENTS FOR CONTROL CIRCUIT DEVICES WITH INTEGRALLY CONNECTED CABLES**		N/A
Annex H	**ADDITIONAL REQUIREMENTS FOR SEMICONDUCTOR SWITCHING ELEMENTS FOR CONTROL CIRCUIT DEVICES**		N/A
Annex J	**SPECIAL REQUIREMENTS FOR INDICATOR LIGHTS AND INDICATING TOWERS**		N/A
Annex K	**SPECIAL REQUIREMENTS FOR CONTROL SWITCHES WITH DIRECT OPENING ACTION**		N/A
Annex L	**SPECIAL REQUIREMENTS FOR MECHANICALLY LINKED CONTACT ELEMENTS**		N/A
Annex M	**TERMINAL MARKING, DISTINCTIVE NUMBER AND DISTINCTIVE LETTER FOR CONTROL CIRCUIT DEVICES**		N/A
Annex N	**Procedure to determine reliability data for electromechanical devices in control circuits used in functional safety applications**		N/A

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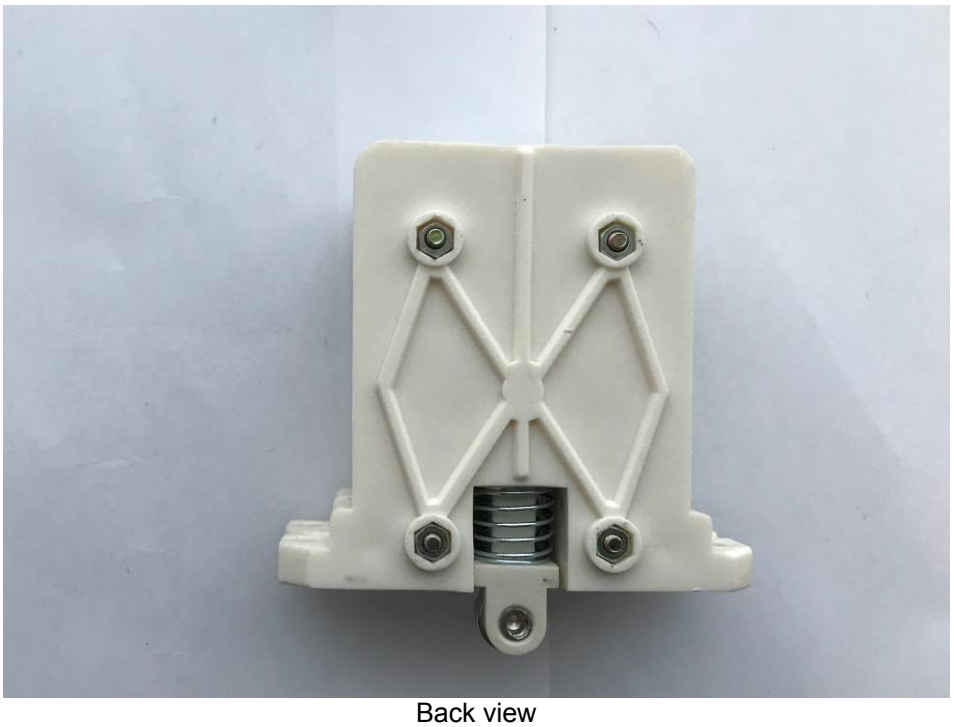
	TABLE 1: Resistance to heat and fire - Glow wire tests						P
Object/ Part No./ Material	**Color**	**Manufacturer/ trademark**	**Glow wire test (GWT); (°C)**				**Verdict**
			650		**960**		
			te	**ti**	**te**	**ti**	
Cover / ABS	White	Wenzhou Yongqi Electrical Technology Co.,Ltd.	-	-	31,2	0,8	P
Base / PC	White	Wenzhou Yongqi Electrical Technology Co.,Ltd.	-	-	32,4	0,6	P
The test specimen passed the glow wire test (GWT) with no ignition [(te – ti) ≤ 2s] (Yes/No) :							Yes
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No) :							No
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)? :							Yes
Ignition of the specified layer placed underneath the test specimen (Yes/No) :							No
Supplementary information: N/A							

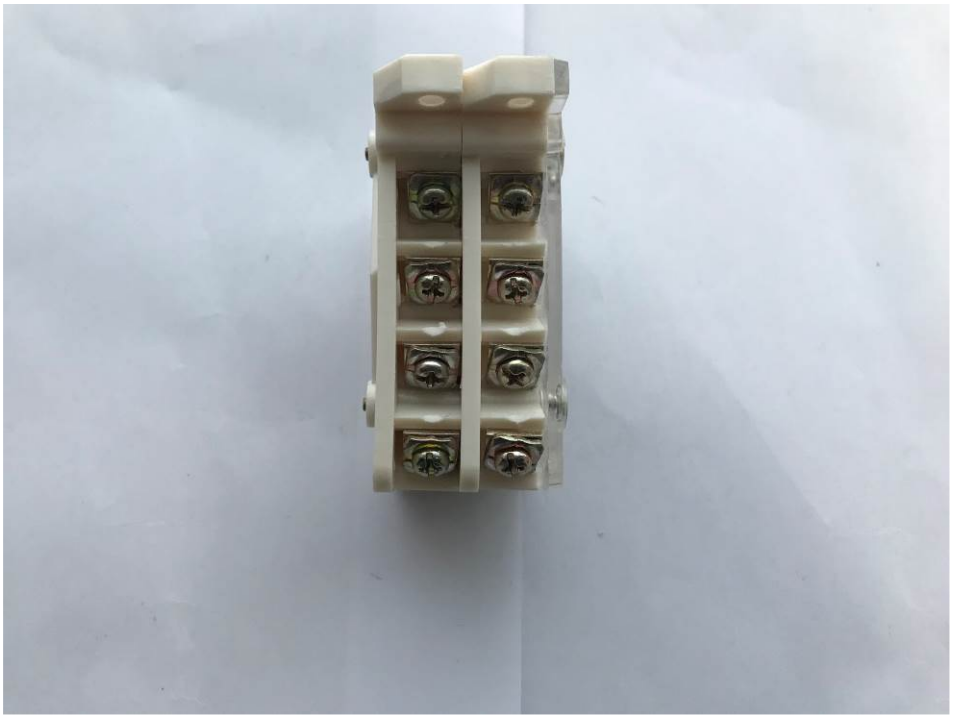
	TABLE 2: Clearance And Creepage Distance Measurements					P
clearance cl and creepage distance dcr at/of:	**Ui (V)**	**Uimp (kV)**	**Required cl (mm)**	**cl (mm)**	**required dcr (mm)**	**dcr (mm)**
Between live parts of auxiliary circuit and parts intended to be earthed	690 Vac	4 kV	3,0 mm	36,8 mm	10 mm	70,5 mm
Between the poles of auxiliary circuit	690 Vac	4 kV	3,0 mm	8,2 mm	10 mm	14,8 mm
Supplementary information: N/A						

Photographs

Front view



Back view



Side view

Top view