Test Report issued under the responsibility of:

DEKRA

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

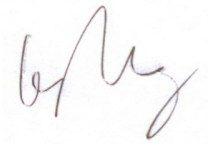
Report Number. .....:	3324093.50
Date of issue.....:	2022-03-17
Total number of pages	271
Name of Testing Laboratory preparing the Report.....:	DEKRA Testing Services (Zhejiang) Co., Ltd.
Applicant's name.....:	HIMEL HONG KONG LIMITED
Address .....:	11/F KERRY CTR 683 KING'S RD 999077 Quarry Bay, Hong Kong
Test specification:	
Standard .....:	IEC 60947-2:2016, AMD1:2019
Test procedure .....:	Type test
Non-standard test method .....:	N/A
Test Report Form No.....:	IEC60947_2J
Test Report Form(s) Originator ....:	DEKRA Certification B.V.
Master TRF .....:	Dated 2020-03-31

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.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description .....:	Air Circuit Breaker
Trade Mark(s).....:	HIMEL
Manufacturer .....:	DELIXI ELECTRIC LTD Delixi High-Tech Industrial Park, Liushi Town, Yueqing City 325604 Zhejiang Province, China
Model/Type reference.....:	HDW3-1000M
Ratings.....:	3P and 4P (protected N pole) Ue: 220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac, 50 / 60 Hz Ui: 1000 V, Uimp: 12 kV In: 200 A / 400 A / 630 A / 800 A / 1000 A Icu: 42 kA at 220 / 230 / 240 / 380 / 400 / 415 Vac, 25 kA at 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac Ics: 30 kA at 220 / 230 / 240 / 380 / 400 / 415 Vac, 25 kA at 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac Icw: 30 kA - 1 s at 220 / 230 / 240 / 380 / 400 / 415 Vac, 20 kA - 1 s at 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac Refer to page 11 to 15 for more technical data

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, P. R. China	
Tested by (name, function, signature).....:		King Wang	
Approved by (name, function, signature)...:		Eric 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:

Notes:

1a) This report is based on test report no. 3322523.50 issued on 2022-02-25.

2a) This report is issued for HIMEL HONG KONG LIMITED, with trade name HIMEL and model HDW3-1000M, which is identical with CDW3-1000N in test report no. 3322523.50.

3a) All the test data except marking check of clause 5.2 is taken from test report no. 3322523.50.

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

☐ **Programme 1 (three pole fully tested)**

☒ **Programme 2 (four pole fully tested)**

☐ **Alternative program not applicable**

Tests performed (name of test and test clause):

No.	Current (A)	Number of poles	Voltage (Vac)	Short circuit current (kA)	Trip unit type	Test sequence
1#	1000	4P	690	-	Genius 4.0H	I
2#	1000	3P	690	-	iTR326H	I
3#	1000	4P	690	-	iTR326	Clause 8.3.3.2 a)
4#	1000	4P	690	-	Genius 4.0A	Clause 8.3.3.2 a)
5#	1000	4P	690	-	Genius 4.0	Clause 8.3.3.2 a)
6#	200	4P	415	30	iTR326A	II
7#	1000	4P	690	25	Genius 4.0H	II+III c)
8#	1000	4P	415	42	Genius 4.0	III
9#	200	4P	415	42	Genius 4.0A	III
10#	1000	4P(PN)	415/ √ 3	25.2	Genius 4.0	III
11#	200	4P(PN)	415/ √ 3	25.2	iTR326A	III
12#	1000	4P(PN)	690/ √ 3	15	Genius 4.0H	III c)
13#	1000	3P	415	42	iTR326	III
38#	1000	4P	690	20 / 1 s	Genius 4.0	IV
15#	1000	4P(PN)	415/ √ 3	18 / 1 s	iTR326	IV
16#	1000	4P(PN)	690/ √ 3	12 / 1 s	Genius 4.0	IV

17#	1000	4P	415	30 /1 s	Genius 4.0A	VI
18#	1000	4P	-	-	Genius 4.0	Annex F.7/F.8/F.9
19#	1000	4P	-	-	Genius 4.0A	Annex F.7/F.8/F.9
20#	1000	4P	-	-	Genius 4.0H	Annex F.7/F.8/F.9
21#	1000	4P	-	-	iTR326H	Annex F.7/F.8/F.9
22#	200	4P	-	-	iTR326	Annex F (EMC) [b)]
23#	200	4P	-	-	Genius 4.0H	Annex F (EMC) [b)]
24#	200	4P	-	-	Genius 4.0A	Annex F (EMC) [b)]
25#	200	4P	-	-	Genius 4.0	Annex F (EMC) [b)]
26#	Shunt release			110 Vdc		Annex N.2.3
27#	Shunt release			220 Vdc		Annex N.2.3
28#	Shunt release			220 / 230 Vac		Annex N.2.3
29#	Shunt release			380 / 400 Vac		Annex N.2.3
30#	Under voltage release			220 / 230 Vac		Annex N.2.3
31#	Under voltage release			380 / 400 Vac		Annex N.2.3
32#	Power module for trip unit			220 / 230 Vac		Annex N.2.3
33#	Power module for trip unit			380 / 400 Vac		Annex N.2.3
34#	Power module for trip unit			110 Vdc		Annex N.2.3
35#	Power module for trip unit			220 Vdc		Annex N.2.3

Notes from test report no. 3322523.50:

1. The product for test is a series of air circuit-breaker (ACB) and there is no construction break within the frame size

2. All tests are conducted on the circuit breaks of withdrawable type to cover the circuit breaks of fixed type.

3. There are six types of trip units: iTR326H, iTR326A, iTR326, Genius 4.0H, Genius 4.0A and Genius 4.0.
   iTR series and Genius series of trip units are in identical except communication interface.
   iTR326H and Genius 4.0H with LCD display,
   iTR326A and Genius 4.0A with display number only,
   iTR326 and Genius 4.0 without display.
   Due to that the trip units have the same fundamental design and similar characteristic, the tests concern trip units are selected in combination among all test sequences in CDW3-1000N series.

4. All the accessories for CDW3-1000N are fully identical as the ones used in CDW3-1600 series with test report no. 3314514.50 issued on 2019-03-11 and CDW3-4000 series with test report no. 3314520.50 issued on 2019-03-11:
   Shunt release: 220 / 230 Vac, 380 / 400 Vac, 50 / 60 Hz; 110 Vdc, 220 Vdc;
   Closing coil: 220 / 230 Vac, 380 / 400 Vac, 50 / 60 Hz; 110 Vdc, 220 Vdc;
   Under-voltage release: 220 / 230 Vac, 380 / 400 Vac, 50 / 60 Hz;
   Stored energy motor: 220 / 230 Vac, 380 / 400 Vac, 50 / 60 Hz; 110 Vdc, 220 Vdc;
   External supply for trip unit: 220 / 230 Vac, 380 / 400 Vac, 50 / 60 Hz; 110 Vdc, 220 Vdc

Shunt release, closing release, under-voltage release and stored energy motor are commonly applicable in CDW3-1000N, CDW3-1600 series and CDW3-4000 series. The test concerns characteristics in the sequence I are selected in combination among above mentioned ACB series. The tests of shunt release and under-voltage release concerns annex N are selected in combination among CDW3-1000N and CDW3-1600 series.

External supply for trip unit is commonly applicable in CDW3-1000N with test report no. 3322523.50 issued on 2022-02-25, CDW3-1600 series with test report no. 3314514.50 issued on 2019-03-11, CDW3-2000 series with test report no. 3314516.50 issued on 2019-03-11, CDW3-4000 series with test report no. 3314520.50 issued on 2019-03-11 and CDW3-6300 series with test report no. 3314522.50 issued on 2019-03-11. All test sequence is with external supply on to trip unit. The tests of external supply concern annex N are selected in combination among CDW3-1000N and CDW3-1600 series.

5. Mark with [a)]: test on the same main breaker (sample no. 1#) with replaced trip unit.

6. Mark with [b)]: test on the same main breaker (sample no. 22#) with replaced trip unit.

7. Mark with [c)]: Connection reversed.

Testing location:

Tests of glow wire and construction check was conducted in:

DEKRA Testing Services (Zhejiang) Co., Ltd.

No.5, Changjiang Road, Great Bridge Industrial Park, North Baixiang, Wenzhou, Zhejiang, 325603, P. R. China

All other tests were subcontracted in:

Shanghai Testing & Inspection Institute for Electrical Equipment Co., Ltd. (STIEE)

No.505, Wuning Road, Putuo District, Shanghai, China

325603, China

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

N/A

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

☒ **Statement not required by the standard used for type testing**

Copy of marking plate:

Copy of marking plate:

Dial switches for trip unit of type iTR326 and Genius 4.0

Remark: for dial switches for ground fault release Ig,
A = 0,2 In, B = 0,3 In, C = 0,4 In, D = 0,5 In, E = 0,6 In, F = 0,8 In, G = 0,9 In, F = 1 In

Copy of marking plate:

Dial switches for trip unit of type iTR326H and Genius 4.0H

Remark: for dial switches for ground fault release Ig,
A = 0,2 In, B = 0,3 In, C = 0,4 In, D = 0,5 In, E = 0,6 In, F = 0,8 In, G = 0,9 In, F = 1 In

Copy of marking plate:

Dial switches for trip unit of type iTR326A and Genius 4.0A

Test item particulars: test item vs. test requirements	
3. Classification	
3.1. Selectivity category: (A or B)..... :	B
3.2. Interruption medium: (air, vacuum, gas break)..... :	Air
3.3. Design: (open construction, moulded case)..... ..... :	Enclosed pole construction
3.4. Method of controlling the operation mechanism: (dependent manual, independent manual, dependent power, independent power, stored energy operation)..... :	Stored energy operation
3.5. Suitability for isolation: (suitable, not suitable)..... ..... :	Suitable
3.6. Provision for maintenance: (maintainable, non-maintainable) ..... :	Non-maintainable
3.7. Method of installation: (fixed, plug-in, withdrawable .... :	Fixed or withdrawable
3.8. Degree of protection of enclosure: (IP code) ..... :	IP20 (only front side)
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 ..... :	N/A
Rated and limiting values, main circuit .... :	
- rated operational voltage: Ue (V)..... :	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac
- rated insulation voltage: Ui (V) ..... :	1000 V for main circuit 690 V for control circuit
- rated impulse withstand voltage: Uimp (kV) ..... :	12 kV for main circuit 4 kV for control circuit
- rated current: In (A) ..... :	200 A / 400 A / 630 A / 800 A / 1000 A
- kind of current ..... :	AC
- conventional free air thermal current: Ith (A) ..... :	Equal to In
- conventional enclosed thermal current: Ithe (A) ..... :	N/A
- current rating for four-pole circuit-breakers: (A) ..... :	Equal to In
- number of poles ..... :	3P or 4P (N pole with overcurrent protection) Protected poles: 3 or 4
- rated frequency: (Hz)..... :	50 / 60 Hz
- integral fuses (rated values)..... :	N/A
Rated duty :	
- eight-hour duty ..... :	N/A
- uninterrupted duty: Iu (A) ..... :	Equal to In

Short-circuit characteristic :	
rated short-time making capacity: Icm (kA) ..... :	88,2 kA at 220 / 230 / 240 / 380 / 400 / 415 Vac, 52,5 kA at 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac
rated ultimate short-circuit breaking capacity: Icu (kA). ..... :	42 kA at 220 / 230 / 240 / 380 / 400 / 415 Vac, 25 kA at 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac
rated service short-circuit breaking capacity: Ics (kA) ..... :	30 kA at 220 / 230 / 240 / 380 / 400 / 415 Vac, 25 kA at 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac
rated short-time withstand current: Icw (kA/s)..... :	30 kA - 1 s at 220 / 230 / 240 / 380 / 400 / 415 Vac, 20 kA - 1 s at 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac
Control circuits : Electrical control circuits :	
- kind of current: (AC, DC)..... :	AC or DC
- rated frequency: (Hz)..... :	50 / 60 Hz
- rated control circuit voltage: Uc (nature, frequency, V) ... :	Undervoltage release: 220 / 230 Vac, 380 / 400 Vac Shunt release: 220 / 230 Vac, 380 / 400 Vac, 110 Vdc, 220 Vdc Closing coil: 220 / 230 Vac, 380 / 400 Vac, 110 Vdc, 220 Vdc
- rated control supply voltage: Us (nature, frequency V) ... :	Stored energy motor: 220 / 230 Vac, 380 / 400 Vac, 110 Vdc, 220 Vdc
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	N/A
- 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 ..... :	Yes
2) Over-current release..... :	Yes
a) instantaneous..... :	Yes
b) definite time delay..... :	Yes
c) inverse time delay..... :	Yes
- independent of previous load ..... :	Yes (electronic release)
- dependent on previous load; (for example thermal type release)..... :	N/A
3) Undervoltage release (for opening) ..... :	Yes
4) Closing releases..... :	Yes
5) Other releases..... :	Ig (Ground fault release) Current setting Ig: For trip unit: iTR326H, iTR326, Genius 4.0H and Genius 4.0: (0,2 / 0,3 / 0,4 / 0,5 / 0,6 / 0,8 / 0,9 / 1,0) x In, off For trip unit: iTR326A and Genius 4.0A: (0,2 - 1,0) x In, OFF, in steps of 1 A tg (time setting): I^2t off: 0,1 s / 0,2 s / 0,3 s / 0,4 s 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s, with tolerance of 140 ms - 200 ms 0,3 s, with tolerance of 230 ms - 320 ms 0,4 s, with tolerance of 350 ms - 500 ms
Characteristics :	
1) Shunt release and undervoltage release (for opening), and closing release..... : ..... :	Yes
- rated control circuit voltage: Uc (nature, frequency, V) ... :	Shunt release: 220 / 230 Vac, 380 / 400 Vac, 110 Vdc, 220 Vdc Undervoltage release: 220 / 230 Vac, 380 / 400 Vac
- kind of current ..... :	AC or DC
- rated frequency: (if AC)..... :	50 / 60 Hz
2) Over-current release..... :	Yes
- rated current..... :	200 A / 400 A / 630 A / 800 A / 1000 A
- kind of current ..... :	AC
- rated frequency: (if AC)..... :	50 / 60 Hz

- current setting (or range of settings)..... :	Ir (inverse time delay tripping setting): For trip unit: iTR326H, iTR326, Genius 4.0H and Genius 4.0: (0,4 / 0,5 / 0,6 / 0,7 / 0,8 / 0,9 / 0,95 / 0,98 / 1) x In For trip unit: iTR326A and Genius 4.0A: (0,4 - 1) x In, in steps of 1 A Isd (short time delay current setting): For trip unit: iTR326H, iTR326, Genius 4.0H and Genius 4.0: (1,5 / 2,0 / 3,0 / 4,0 / 5,0 / 6,0 / 8,0 / 10) x Ir, off For trip unit: iTR326A and Genius 4.0A: (1,5 - 10) x Ir, off in steps of 1 A for Isd < 10 kA, in steps of 0,01 kA for Isd ≥ 10 kA Ii (instantaneous current setting): For trip unit: iTR326H, iTR326, Genius 4.0H and Genius 4.0: (2 / 3 / 4 / 6 / 8 / 10 / 12 / 15) x In, off For trip unit: iTR326A and Genius 4.0A: (2 - 15) x In, off in steps of 1 A for Ii < 10 kA, in steps of 0,01 kA for Ii ≥ 10 kA Making current release: 16 kA
- time settings (or range of settings)..... :	tr (inverse time delay time setting): 1 s / 2 s / 4 s / 8 s / 12 s / 16 s / 20 s / 24 s / 30 s, with tolerance of ± 10% (at 6 Ir) 2 Ir tripping time declared by the manufacturer: when tr = 1 s: 8,1 s - 9,9 s when tr = 30 s: 243 s - 297 s tsd (short time delay time setting): I^2t off: 0,1 s / 0,2 s / 0,3 s / 0,4 s 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s, with tolerance of 140 ms - 200 ms 0,3 s, with tolerance of 230 ms - 320 ms 0,4 s, with tolerance of 350 ms - 500 ms non-tripping duration stated by the manufacturer: 0,1 s: 80 ms 0,2 s: 140 ms 0,3 s: 230 ms 0,4 s: 350 ms

Test item particulars..... :	Air Circuit-Breaker
Classification of installation and use..... :	Withdrawable or fixed
Supply Connection..... :	3 phase or 3 phase with Neutral
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 .....:	2021-03-10 2021-10-24 (3322523.50)
Date (s) of performance of tests.....:	2021-03-10 2021-10-26 to 2022-01-20 (3322523.50)

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.

Though it is not mentioned on the first page, the following standard was also taken into consideration:
EN 60947-2:2017 + A1:2020
IEC 60947-1:2007 + A1:2010 + A2:2014
EN 60947-1:2007 + A1:2011 + A2:2014

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

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

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

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

General product information and other remarks:

Nomenclature breakdown:

HDW3 - 1000 M
a b c

a = Model name: HDW3

b = Frame size: 1000

c = short-circuit capacity: 'M'

Connection:
Minimum cross-sectional area of conductor (copper conductor with cable lug): 95 mm^2
Maximum cross-sectional area of conductor (Copper busbar): (60 x 5) mm^2 x 2

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

5.2	**MARKING** HDW3-1000M, 1000 A, 4 poles, sample no. 39#		
	Visible from the front when the circuit-breaker is installed as in service and actuator is accessible:		
1.1	- rated current (In):	1000 A	P
1.2	- suitability for isolation, if applicable, with the symbol 		P
1.3	- indication of the open and closed position: with ○ and I respectively, if symbols are used		P
	Marked on the circuit-breaker:		
2.1	- manufacturer's name or trade mark	Himel	P
2.2	- type designation or catalogue reference	HDW3-1000M	P
2.3	- IEC 60947-2, if the manufacturer claims compliance with this standard.	IEC/EN 60947-2	P
2.4	- selectivity category A or B	B	P
2.5	- rated operational voltage(s) Ue	400 / 415 V, 660 / 690 V	P
2.6	- unsuitability for IT systems, if applicable, with the symbol 	 is marked	P
2.7	-rated impulse withstand voltage (Uimp);	12 kV	P
2.8	- value (or range) of the rated frequency and/or the indication “d.c” (or the symbol ⎓)	50 / 60 Hz	P
2.9	- rated service short-circuit breaking capacity (Ics) at the corresponding rated voltage (Ue)	400 / 415 V: 30 kA, 660 / 690 V: 25 kA	P
2.10	- rated ultimate short-circuit breaking capacity (Icu) at the corresponding rate voltage (Ue)	400 / 415 V: 42 kA, 660 / 690 V: 25 kA	P
2.11	- rated short-time withstand current (Icw) and associated short-time delay, for selectivity category B	400 / 415 V: 30 kA - 1 s, 660 / 690 V: 20 kA - 1 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.12	- range of the current setting (Ir) of the adjustable overload release (may be displayed)	For trip unit: iTR326H, iTR326, Genius 4.0H and Genius 4.0: Ir: (0,4 / 0,5 / 0,6 / 0,7 / 0,8 / 0,9 / 0,95 / 0,98 / 1) x In For trip unit: iTR326A and Genius 4.0A: Ir: (0,4 - 1) x In, in steps of 1 A	P
2.13	- range of the rated instantaneous short-circuit current setting (Ii), for adjustable overload releases (may be displayed)	For trip unit: iTR326H, iTR326, Genius 4.0H and Genius 4.0: Ii: (2 / 3 / 4 / 6 / 8 / 10 / 12 / 15) x In, off For trip unit: iTR326A and Genius 4.0A: Ii: (2 - 15) x In, off in steps of 1 A for Ii < 10 kA, in steps of 0,01 kA for Ii ≥ 10 kA	P
2.14	- ref. temperature for non-compensated thermal releases, if different from 30 °C		N/A
2.15	- terminals identification, according to 7.1.8.4 of IEC 60947-1:2007:		P
	- terminal of coils (A/B)		P
	- terminal of shunt release (C)		P
	- terminals of under-voltage release (D)		P
	- 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
2.16	- line and load terminals, if applicable	Immaterial	N/A
2.17	- neutral pole terminals, if applicable, by the letter N	N is marked	P
2.18	- protective earth terminal, where applicable, by the symbol ⏚ (see 7.1.10.3 of part 1)	⏚ is marked	P
	Provided in the manufacture's literature:		
3.1	- rated short-circuit making capacity (I_{cm}), if higher than that specified in 4.3.6.1		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
3.2	- rated insulation voltage. (U_i), if higher than the maximum rated operational voltage	1000 V	P
3.3	- pollution degree if other than 3		N/A
3.4	- conventional enclosed thermal current (I_{the}) if different from the rated current:		N/A
3.5	- IP Code, where applicable:	IP20 (only front side)	P
3.6	- minimum enclosure size and ventilation data (if any) to which marked ratings apply:		N/A
3.7	- details of minimum distance between circuit-breaker and earthed metal parts for circuit-breaker intended for use without enclosure:	All sides: 0 mm	P
3.8	- suitability for environment A or B per annex J, as applicable	A	P
3.9	- RMS sensing, if applicable, accordance with F.4.1.1		P
3.10	- minimum cable cross-section, if different from Table 9 of IEC 60947-1, for ratings ≤ 20 A according to rated ultimate short-circuit breaking capacity I_{cu}		N/A
3.11	- values of tightening torque for the circuit-breaker terminals.	M10 / 50 Nm	P
3.12	- current derating for terminals and connections, if applicable		N/A
	Marked on the auxiliaries or on the circuit-breaker, if marking space is sufficient; additionally, data shall be made available in the manufacturer's literature:		
4.1	- for closing releases (see 2.23) and/or motor-operators, rated control circuit voltage, kind of current and rated frequency for a.c	Energy stored motor: 220 / 230 Vac, 380 / 400 Vac (50/60 Hz) 110 Vdc, 220 Vdc Closing release: 220 / 230 Vac, 380 / 400 Vac (50/60 Hz) 110 Vdc, 220 Vdc	P
4.2	- rated control circuit voltage of the shunt release and/or of the under-voltage release (or of the no-voltage release), kind of current and rated frequency for a.c:	Shunt release: 220 / 230 Vac, 380 / 400 Vac (50/60 Hz) 110 Vdc, 220 Vdc Under-voltage release: 220 / 230 Vac, 380 / 400 Vac (50/60 Hz)	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
4.3	- rated current of indirect over-current releases:		N/A
4.4	- number and type of auxiliary contacts, rated operational currents at the rated operational voltages, and rated frequency for a.c.		N/A

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

7.1	**CONSTRUCTION**		
7.1.2 part 1	Materials		
7.1.2.2	Glow wire testing		
	The requirements of 7.1.2 of IEC 60947:2007/AMD1:2010/AMD2:2014 do not apply to parts with a mass lower than 2 g (insignificant mass, in accordance with 3.14 of IEC 60695-2-11:2014). For products containing a plurality of small parts, the total mass of non-tested parts located in close proximity to each other shall not exceed 10 g. Proximity shall be based on engineering judgment that takes into consideration the risk of propagation of fire.	See appended TABLE 17	P
	The suitability of materials used is verified by making tests on .....: or	Sections taken from the equipment	P
	- providing data from the insulating material supplier fulfilling the requirements according to IEC 60695-2-12		N/A
	Glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11		
	Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 960 °C for main circuit		P
	No visible flame and no sustained glowing		P
	Flames and glowing extinguish within 30 s		N/A
	No ignition of the tissue paper		P
	Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 850 °C for other circuits		N/A
	No visible flame and no sustained glowing		N/A
	Flames and glowing extinguish within 30 s		N/A
	No ignition of the tissue paper		N/A
	Parts of insulating material not necessary to retain current-carrying parts in position, even though in contact with them: test temperature 650 °C		P
	No visible flame and no sustained glowing		P
	Flames and glowing extinguish within 30 s		N/A
	No ignition of the tissue paper		P
7.1.2.3	Test based on flammability category		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For parts of insulating materials, hot wire ignition and, where applicable, arc ignition tests as specified in 8.2.1.1.2, shall be made based on flammability category		N/A
	Tests on materials are made in accordance with Annex M		N/A
	The hot wire ignition (HWI) and arc ignition (AI) test value requirements related to the material flammability category shall conform to Table M.1 or M.2		N/A
	Alternatively, the manufacturer may provide data from the insulating material supplier fulfilling the requirements given in Annex M		N/A
7.1.3 part 1	Current-carrying parts and their connections		
	Current-carrying parts have the necessary mechanical strength and current-carrying capacity for their intended use		P
	For electrical connections, no contact pressure is transmitted through insulating material other than ceramic or other material with characteristics not less suitable, unless there is sufficient resiliency in the metallic parts to compensate for any possible shrinkage or yielding of the insulation material		P
7.1.5 part 1	Actuator		
7.1.5.1	Insulation		
	The actuator of the equipment shall be insulated from the live parts for the rated insulation voltage and, if applicable, the rated impulse withstand voltage		P
	If it is made of metal, it shall be capable of being satisfactorily connected to a protective conductor unless it is provided with additional reliable insulation		N/A
	If it is made of or covered by insulating material, any internal metal part, which might become accessible in the event of insulation failure, shall also be insulated from live parts for the rated insulation voltage		P
7.1.5.2	Direction of movement		
	The direction of operation for actuators of devices shall normally conform to IEC 60447.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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		P
7.1.6 part 1	Indication of contact position		
7.1.6.1	Indicating means		
	When an equipment is provided with means for indicating the closed and open positions, these positions shall be unambiguous and clearly indicated		P
	This is done by means of a position indicating device (see 2.3.18)		P
	If symbols are used, they shall indicate the closed and open position respectively, in accordance with IEC 60417-2:		
	- 60417-2-IEC-5007 **I** On (power)		P
	- 60417-2-IEC-5007 **O** Off (power)		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”		P
	Red colour shall not be used for any other push-button		P
	The colours of other push-buttons, illuminated push-buttons and indicator lights shall be in accordance with IEC 60073		P
7.1.6.2	Indication by the actuator		
	When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided		N/A
7.1.8 part 1	Terminals		
7.1.8.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength		P
	Terminal connections shall be such that necessary contact pressure is maintained		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 :	Prepared copper conductor with cable lug or copper busbar	P
	minimum cross-sectional area of conductor (mm²) :	95 mm^2	P
	maximum cross-sectional area of conductor (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	number of conductors simultaneously connectable to the terminal :	As above	P
7.1.8.3	Connection		
	terminals for connection to external conductors shall be readily accessible during installation		P
	clamping screws and nuts shall not serve to fix any other component		P
7.1.8.4	Terminal identification and marking		
	terminal intended exclusively for the neutral conductor	N is marked for 4P	P
	protective earth terminal		P
	other terminals		P
7.1.10 part 1	Provisions for protective earthing		
7.1.10.1	The exposed conductive parts (e.g. chassis, framework and fixed parts of metal enclosures) other than those which cannot constitute a danger shall be electrically interconnected and connected to a protective earth terminal for connection to an earth electrode or to an external protective conductor		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	The resistance of the circuit from the exposed conductive part to the protective earth terminal is 2,3 mΩ < 100 mΩ, which is tested according to clause 9.2.9 of IEC 60947-1: 2020.	P
	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		P
7.1.10.2	Protective earth terminal		
	The protective earth terminal shall be readily accessible and so placed that the connection of the equipment to the earth electrode or to the protective conductor is maintained when the cover or any other removable part is removed		P
	The protective earth terminal shall be suitably protected against corrosion		P
	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		P
	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). I_n this case, it shall also have the function of a neutral terminal in addition to meeting the requirements applicable to the protective earth terminal		P
7.1.10.3	Protective earth terminal marking and identification		
	The protective earth terminal shall be clearly and permanently identified by its marking		P
	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		P
	Graphical symbol to be used: 60417-2-IEC-5019 ⏚ Protective earth (ground) in accordance with IEC 60417-2	⏚ is marked	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.11 part 1	Enclosure for equipment		
7.1.11.1	Design		
	The enclosure, when it is opened: all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space shall be provided inside the enclosure		N/A
	The fixed parts of a metal enclosure shall be electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		N/A
	Under no circumstances shall a removable metal part of the enclosure be insulated from the part carrying the earth terminal when the removable part is in place		N/A
	The removable parts of the enclosure shall be firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		N/A
	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means shall be provided to prevent loss of the fastening devices		N/A
	If the enclosure is used for mounting push-buttons, it shall not be possible to remove the buttons from the outside of the enclosure		N/A
7.1.11.2	Insulation		
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining shall be securely fixed to the enclosure		N/A
7.1.12 part 1	Degree of protection of enclosed equipment		
	Degree of protection.	IP20 Note: IP20 was checked on the front side of the ACB.	
	Test for first characteristic.	IP2X	
	Test for first numeral (1, 2, 3, 4, 5, 6).....:	2 (only front side)	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test for second characteristic	IPXX	
	Test for second numeral (1, 2, 3, 4, 5, 6, 7, 8) .....:		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
7.1.2	Withdrawable circuit-breaker		P
	In the disconnected position (main- and auxiliary circuits)		
	Isolating distances for circuit-breaker suitable for isolating comply with the requirements specified for the isolating function		P
	Mechanism fitted with a reliable indicating device with indicates the position of the isolating contacts.		P
	Mechanism fitted with interlocks which only permit the isolating contacts to be separate or re-closed when main contacts are open		P
	Mechanism fitted with interlock, which only permit the main contacts to be closed when the isolating contacts are fully closed.		P
	Mechanism fitted with interlock, which only permit the main contacts to be closed when in disconnected position.		P
	I_n disconnected position, the isolating distances between the isolating contacts cannot be inadvertently reduced.		P
7.1.3	Additional requirements for circuit-breakers suitable for isolation		P
7.1.7 part 1	Additional safety requirements for equipment suitable for isolation		
7.1.7.1	Additional constructional requirements for equipment suitable for isolation (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		N/A
	- a separate mechanical indicator		P
	- visibility of the moving contacts		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	When means are provided or to lock the equipment in the open position, locking only be possible when contacts are in the open position		N/A
	Actuator front-plate fitted to the equipment in a manner which ensures correct contact position indication and locking		P
	The indicated open position is the only position in which the specified isolation distances between the contacts is ensured.		P
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm) :	14 mm	
	- measured clearances (mm) :	30,3 mm See appended TABLE 16	P
	- test Uimp across gap (kV) :	18,5 kV	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	If the tripped position is not the indicated open position, it should be clearly identified.		
7.1.4	Clearances and creepage distances:		
	For circuit-breakers for which the manufacturer has declared a value of rated impulse withstand voltage. (Uimp.)		
	Clearances distances:		
	- Uimp is given as:	12 kV for main circuit 4 kV for control circuit	
	- max. value of rated operational voltage to earth	1000 Vac	
	- nominal voltage of supply system:	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	- overvoltage category:	III	
	- pollution degree:	3	
	- field-in or homogeneous:	Inhomogeneous field	
	- minimum clearances (mm):	14 mm	
	- measured clearances (mm):	Min measured value: 25,4 mm See appended TABLE 16	P
	Creepage distances:		
	- rated insulation voltage Ui (V)	1000 Vac for main circuit 690 Vac for control circuit	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- pollution degree	3	
	- comparative tracking index (V)	225 V	
	- material group	IIIa	
	- minimum creepage distances (mm)	16 mm	
	- measured creepage distances (mm)	Min measured value: 49,9 mm See appended TABLE 16	P
7.1.5	Requirements for the safety of the operator		
	There shall be no path or opening which allows incandescent particles to be discharged from the area of the manual operating means:		P
7.1.7	Additional requirements for equipment provided with a neutral pole		
7.1.9 part 1	When equipment is provided with a pole intended only for connecting the neutral, this pole shall be clearly identified to that effect by the letter N (see 7.1.7.4.).	N is marked for 4P	P
	A switched neutral pole shall break not before and shall make not after the other poles		P
	For equipment having a value of conventional thermal current (free air or enclosed, see 4.3.2.1 and 4.3.2.2) not exceeding 63 A, this value shall be identical for all poles		N/A
	For higher conventional thermal current values, the neutral pole may have a value of conventional thermal current different from that of the other poles, but not less than half that value or 63 A, whichever is the higher	100% In	N/A
	If a pole with an appropriate making and breaking capacity is used as a neutral pole, then all poles, incl. the neutral pole, may operate substantially together.		P
7.1.8	Digital inputs and outputs for use with programmable logic controllers (PLCs)		
	Compliant with Annex S of IEC 60947-1:2007		N/A
	Annex S does not apply to digital inputs and outputs dedicated to devices other than PLCs		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2	Performance requirements		
7.2.1	Operating condition		
7.2.1.1	Closing		
	For a circuit-breaker to be closed safely on to the making current corresponding to its rated short-circuit making capacity, it is essential that it should be operated with the same speed and the same firmness as during the type test for proving the short-circuit making capacity		P
7.2.1.1.2	Dependent manual closing		
	For a circuit-breaker having a dependent manual closing releases, 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
	However, this does not apply in the case of a circuit-breaker having a dependent manual closing releases and incorporating an integral fast-acting opening release which causes the circuit-breaker to break safely, irrespective of the speed and firmness with which it is closed on to prospective peak currents exceeding 10 kA; in this case, a rated short-circuit making capacity can be assigned		N/A
7.2.1.1.3	Independent manual closing		
	A circuit-breaker having an independent manual closing releases can be assigned a short-circuit making capacity rating irrespective of the conditions of mechanical operation		P
7.2.1.1.4	Dependent power closing		
	At 110% of the rated control supply voltage, the closing operation performed on no-load shall not cause any damage to the circuit-breaker.		N/A
	At 85% of the rated control supply voltage, the closing operation shall be performed when the current established by the circuit-breaker is equal to its rated making capacity within the limits allowed by the operation of its relays or releases and, if a maximum time is stated for the closing operation, in a time not exceeding this maximum time limit.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.1.5	Independent power closing		
	A circuit-breaker having an independent power closing operation can be assigned a rated short-circuit making capacity irrespective of the conditions of power closing		P
	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		P
7.2.1.1.6	Stored energy closing		
	Capable ensuring closing of the circuit-breaker in any condition between no-load and its rated making capacity		P
	- when the stored energy is retained within the circuit-breaker, a device is provided which indicates when the storing mechanism is fully charged.		P
	- 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.		P
	- not possible for the moving contacts to move from the open position, unless the charge is sufficient for satisfactory completion of the closing operation.		P
	- 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.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.2	Opening		
7.2.1.2.1	Circuit-breakers which open automatically shall be trip-free and, unless otherwise agreed between manufacturer and user, shall have their energy for the tripping operation stored prior to the completion of the closing operation		
7.2.1.2.2	Opening by undervoltage releases		
7.2.1.3. part 1	Limits of operation of under-voltage relays and releases		
7.2.1.3. a	Operating voltage		
	An under-voltage relay or release, when associated with a switching device, shall operate to open the equipment even on a slowly falling voltage within the range between 70% and 35% of its rated voltage		P
	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		P
	Unless otherwise stated in the relevant product standard, the upper limit of the supply voltage shall be 110% of its rated value		P
7.2.1.3. b	Operating time		
	For a time-delay under-voltage relay or release, the time-lag shall be measured from the instant when the voltage reaches the operating value until the instant when the relay or release actuates the tripping device of the equipment		N/A
7.2.1.2.3	Opening by shunt releases		P
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		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1.2.4	Opening by over-current releases		
a)	Opening under short-circuit conditions		
	The short-circuit release shall cause tripping of the circuit-breaker with an accuracy of 20% of the tripping current value of the current setting for all values of the current setting of the short-circuit current release		P
	Where necessary for over-current co-ordination the manufacturer shall provide information (usually curves) showing		N/A
	- maximum cut-off (let-through) peak current as a function of prospective current (r.m.s. symmetrical)		N/A
	- 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 $\pm$ 10% of the tripping current value of the current setting for all values of current setting of the overload release		N/A
2)	Inverse time-delay operation		
	At the reference temperature and at 1,05 times the current setting with the conventional non-tripping current, the opening release being energized on all poles, tripping shall not occur in less than the conventional time from the cold state, i.e. with the circuit-breaker at the reference temperature		P
	Moreover, when at the end of the conventional time the value of current is immediately raised to 1,30 times the current setting, i.e. with the conventional tripping current, tripping shall then occur in less than the conventional time later		P
	If a release is declared by the manufacturer as substantially independent of ambient temperature, the current values of table 6 shall apply within the temperature band declared by the manufacturer, within a tolerance of 0,3%/K		N/A
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.4.2	Operational performance capability		
7.2.4.2 part 1	The operational performance off-load for which the tests are made with the control circuits energized and the main circuit not energized, in order to demonstrate that the equipment meets the operating conditions specified at the upper and lower limits of supply voltage and/or pressure specified for the control circuit during closing and opening operations		P
	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

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

8	**TESTS**		
8.2.1 part 1	Materials		
8.2.1.1	Test of resistance to abnormal heat and fire		
8.2.1.1.1	Glow wire test (on equipment)		
	The glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11 are performed on		
	the equipment; or		N/A
	sections taken from the equipment; or	Sections taken from the equipment See appended TABLE 17	P
	any parts of identical material having representative thickness		N/A
8.2.1.1.2	Flammability, hot wire ignition and arc ignition tests (on materials)		
	flammability test, in accordance with IEC 60695-11-10;		N/A
	hot wire ignition (HWI) test, as described in Annex M;		N/A
	arc ignition (AI) test, as described in Annex M.		N/A
8.2.4 part 1	Mechanical properties of terminals		
	Mechanical strength of terminals		
	maximum cross-sectional area of conductor (mm²) :	Copper busbar 60 x 5 mm^2	
	diameter of thread (mm) :	10 mm	
	torque (Nm) :	1,1 x 50 = 55 Nm	
	5 times on 2 separate clamping units		P
	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm²) :		
	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) :		
	135 continuous revolutions: 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
	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** CDW3-1000N, 1000 A, 4 poles, equipped with trip unit of Genius 4.0H, sample no. 1#		
8.3.3.2	Test of tripping limits and characteristic		
8.3.3.2.2	Short circuit releases		
	Manufacturer's name or trademark	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	1#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	Ambient temperature 10-40 °C :	21 / 22 / 24 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Range of adjustable setting current. (A)	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Time delay stated by the manufacturer, in the case of definite time delay releases.	tsd: 0,1 s - 0,4 s tg: 0,1 - 0,4 s 0,1 s, with tolerance of 80 ms - 140 ms 0,4 s, with tolerance of 350 ms - 500 ms	P
	Electromagnetic over current 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

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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 over current releases		
	For circuit-breakers with an electronic over current release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		P
	Test current: 80% of the rated, or **minimum** adjustable setting current: (A)	Ii: 0,8 x 2 x In L1: 1,60 kA L2: 1,60 kA L3: 1,60 kA N: 1,61 kA Isd: 0,8 x 1,5 x 0,4 x In tsd: 0,1 s L1: 481 A L2: 481 A L3: 481 A N: 482 A Ig: 0,8 x 0,2 x In tg: 0,1 s L1: 181 A L2: 181 A L3: 181 A N: 181 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P

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: L3: N: L1: L2: L3: N:	tsd: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping tg: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P
	Test current: 120% of the rated, or **minimum** adjustable setting current: (A)	Ii: 1,2 x 2 x In L1: 2,41 kA L2: 2,41 kA L3: 2,41 kA N: 2,41 kA Isd: 1,2 x 1,5 x 0,4 x In tsd: 0,1 s L1: 721 A L2: 721 A L3: 721 A N: 721 A Ig: 1,2 x 0,2 x In tg: 0,1 s L1: 222 A L2: 222 A L3: 222 A N: 222 A	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 40 ms 36 ms 36 ms 35 ms	P

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: L3: N: L1: L2: L3: N:	 Isd: 109 ms 104 ms 109 ms 105 ms Ig: 108 ms 106 ms 108 ms 107 ms	P
	Test current: 80% of the **maximum** adjustable setting current: (A)	Ii: 0,8 x 15 x In L1: 12,1 kA L2: 12,1 kA L3: 12,1 kA N: 12,1 kA Isd: 0,8 x 10 x 1,0 x In tsd: 0,4 s L1: 8,02 kA L2: 8,02 kA L3: 8,02 kA N: 8,01 kA Ig: 0,8 x 1 x In tg: 0,4 s L1: 902 A L2: 902 A L3: 902 A N: 902 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P

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: L3: N: L1: L2: L3: N:	tsd: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping tg: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping	P
	Test current: 120% of the **maximum** adjustable setting current: (A)	Ii: 1,2 x 15 x In L1: 18,1 kA L2: 18,1 kA L3: 18,1 kA N: 18,0 kA Isd: 1,2 x 10 x 1,0 x In tsd: 0,4 s L1: 12,1 kA L2: 12,1 kA L3: 12,1 kA N: 12,1 kA Ig: 1,2 x 1 x In tg: 0,4 s L1: 1,10 kA L2: 1,10 kA L3: 1,10 kA N: 1,10 kA	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 37 ms 33 ms 37 ms 39 ms	P

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: L3: N:	Isd: 420 ms 416 ms 417 ms 419 ms Ig: 416 ms 419 ms 420 ms 418 ms	P
8.3.3.2.3	Overload releases		
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	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	1#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	22 °C	P
	Range of adjustable setting current: (A)	Ir: (0,4 - 1) x 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)	For phase poles: 421 A (1,05 x 0,4 x In) For N pole: 422 A (1,05 x 0,4 x In) tr: 1 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the rated, or **minimum** adjustable setting current: (A)	520 A (1,3 x 0,4 x In) tr: 1 s	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.	624 A (1,2 x 1,3 x 0,4 x In) tr: 1 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	21,9 s for phase poles 14,8 s for N pole	P
	Test current: 105% of the **maximum** adjustable setting current: (A)	For phase poles: 1,05 KA (1,05 x 1,0 x In) For N pole: 1,05 KA (1,05 x 1,0 x In) tr: 30 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the **maximum** adjustable setting current: (A)	1,31 kA (1,3 x 1,0 x In) tr: 30 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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.	1,57 kA (1,2 x 1,3 x 1,0 x In) tr: 30 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	10 min 09 s for phase poles 6 min 57 s for N pole	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
	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	Requirement for thermal-magnetic release	N/A
	Test ambient air temperature:	22 °C	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Minimum setting: 802 A (2 x 0,4 x In) tr: 1,0 s,	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	8,7 s Tripping time specified by the manufacturer: 8,1 s ≤ t ≤ 9,9 s	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Maximum setting: 2,01 kA (2 x 1,0 x In) tr: 30 s,	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	4 min 16 s Tripping time specified by the manufacturer: 243 s ≤ t ≤ 297 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:	Requirement for thermal-magnetic release	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)	Requirement for thermal-magnetic release	N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	Requirement for thermal-magnetic release	N/A
8.3.3.2.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	short-circuit releases		P
	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.		P
	Test current: 1,5 times of the rated, or **minimum** adjustable setting current: (A)	Isd: 903 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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:	107 ms	P
	Time-delay: between the limits stated by the manufacturer:	80 ms - 140 ms	P
	Test current: 1,5 times of the **maximum** adjustable setting current: (A)	Isd: 15,1 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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)L L2: L3:	414 ms	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time-delay: between the limits stated by the manufacturer:	350 ms - 500 ms	P
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		P
	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.		P
	Test current: 1,5 times of the **minimum** adjustable setting current: (A)	Isd: 902 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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)	80 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,2 s, non-tripping Reduced to 401 A	P
	Rated current	400 A (set at 0,4 x In)	P
	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:	0,2 s, non-tripping	P
	Test current: 1,5 times of **maximum** adjustable setting current: (A)	Isd: 15,2 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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)	350 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,8 s, non-tripping Reduced to 1000 A	P
	Rated current	1000 A (set at 1,0 x In)	P
	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:	0,8 s, non-tripping	P
8.3.3.3	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	12 kV for main circuit 4 kV for control circuit	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	15,0 kV	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :	4,8 kV	P
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	18,5 kV	P
a)	Application of test voltage		P

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		P
	- other circuits		P
	- exposed conductive parts		P
	- enclosure of mounting plate		P
	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) :	1000 Vac for main circuit 690 Vac for control circuit	P
	- main circuits, test voltage for 1 min (V)	2200 Vac, 60 s	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)	1890 Vac, 60 s	P
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.		P
	- 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.		P
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.		P
	No unintentional disruptive discharge during the tests		P
(i)	the normal positions of operation include the tripped position, if any;		P
(ii)	circuits incorporating solid-state devices connected to the main circuit shall be disconnected for the test;		N/A
(iii)	circuit-breakers not declared as suitable for isolation shall be tested with the test voltage applied across the poles of the main circuit, the line terminals being connected together and the load terminals being connected together.		N/A
(iv)	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA.	759 Vac L1: 0,005 mA L2: 0,005 mA L3: 0,005 mA N: 0,005 mA	P
(v)	circuit-breakers having a rated insulation voltage greater than 1 000 V a.c. shall be tested at a voltage of Ui + 1 200 V a.c. r.m.s. or 2 Ui whichever is the greater		N/A
(vi)	withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		P
8.3.3.4	Mechanical operation and operational performance capability		
8.3.3.4.2	Construction and mechanical operation		
8.3.3.4.2.1	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.2		P
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4.2.2	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.4		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.	Stored energy motor (380 / 400 Vac): 323 - 440 Vac tested at 50 Hz and 60 Hz	P
	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		P
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
8.3.3.4.2.3	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable	Undervoltage release with rated voltage 380 / 400 Vac	P
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified	Operating limits: 140 - 266 Vac tested at 50 Hz and 60 Hz	P
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		P
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil	drop out voltage: 216 Vac tested at 50 Hz 218 Vac tested at 60 Hz	P
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range	starts from: 400 Vac tested at 50 Hz and 60 Hz	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	drop out voltage: 210 Vac (from 380 Vac) tested at 50 Hz 213 Vac (from 380 Vac) tested at 60 Hz 214 Vac (from 400 Vac) tested at 50 Hz 216 Vac (from 400 Vac) tested at 60 Hz	P
	This test may be combined with the temperature-rise test of 8.3.3.7		P
	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	starts from: 380 Vac / 400 Vac	P
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	120 Vac was applied ACB cannot be closed tested at 50 Hz and 60 Hz	P
	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	323 Vac was applied ACB can be closed tested at 50 Hz and 60 Hz	P
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	440 Vac tested at 50 Hz and 60 Hz	P
8.3.3.4.2.4	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable	380 / 400 Vac 266 Vac and 440 Vac were applied, ACB tripped tested at 50 Hz and 60 Hz	P
	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	266 Vac was applied, ACB tripped tested at 50 Hz and 60 Hz	P
	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		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4.3	Operational performance capability without current.		
	Type designation or serial number	CDW3-1000N	
	Sample no:	1#	
	Rated current In (A)	1000 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing releases: Uc (V)	380 / 400 Vac	
	Rated control supply voltage of shunt releases: Uc (V)	380 / 400 Vac	
	Rated control supply voltage undervoltage releases: Uc (V)	380 / 400 Vac	
	Ambient temperature 10-40 °C :	23 °C	P
	Number of operating cycles per hour	20 cycles per hour	P
	Number of cycles without current (total) (closing releases energized at the rated Uc)	2500	P
	Number of cycles without current (without releases)	2000	P
	Applied voltage of closing releases (V)	380 Vac	P
	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	250	P
	Applied voltage: shunt releases (V)	400 Vac	P
	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	250	P
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)	380 Vac	P
	Applied voltage: undervoltage releases (V)	380 Vac	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		P
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4.4	Operational performance capability with current.		
	Rated current: In (A)	1000 A	
	Maximum rated operational voltage: Ue (V)	690 Vac	
	Conductor cross-sectional area (mm²) :	240 mm^2 x 2	P
	Number of operating cycles per hour	20 cycles per hour	P
	Number of cycles with current (total) (closing releases energized at the rated Uc)	500	P
	Applied voltage: closing releases (V)	380 Vac	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.	Ir: 1 x In, tr: 30 s Ii: 2 x In Isd: 1,5 x Ir, tsd: 0,1 s	P
	Conditions, make/break operations:		P
	- test voltage U/Ue = 1,0 (V) .....L1-L2: .....L2-L3: L1-L3:	692 Vac 692 Vac 693 Vac	P
	- test current I/Ie = 1,0 (A) .....L1: .....L2: L3:	1,01 kA 1,01 kA 1,02 kA	P
	- power factor/time constant:	0,81	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	Min: 102 ms	P
	- off-time (s):	Max 179,9 s	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		P
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		P
8.3.3.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		P
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		P
8.3.3.5	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sample no:		
	Rated current In (A)		
	Rated operational voltage: Ue (V)		
	Rated control supply voltage of closing releases: Uc (V)		
	Rated control supply voltage of shunt releases: Uc (V)		
	Rated control supply voltage undervoltage releases: Uc (V)		
	Ambient temperature 10-40 °C :		N/A
	Number of operating cycles per hour		N/A
	Maximum rated operational voltage: Ue (V)		N/A
	Number of operating cycles per hour		N/A
	Number of cycles with current (total) (closing releases energized at the rated Uc)		N/A
	Applied voltage: closing releases (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:		N/A
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:		N/A
	- test current AC/DC: I/Ie = 6,0/2.5 (A) .....L1: .....L2: L3:		N/A
	- power factor/time constant:		N/A
	- Number of cycles manually opened: 9		N/A
	- Number of cycles automatically opened by an overload release: 3		N/A
	for circuit-breakers having a short-circuit release of a maximum setting less than the test current		
	all 12 operations automatic		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If the testing means do not withstand the let-through energy occurring during the automatic operation		
	– 12 manual operations – three additional operations with automatic opening, made at any convenient voltage		N/A
	- frequency: (Hz)		N/A
	- on-time max 2s:		N/A
	Operating rate if different from Table 8		N/A
8.3.3.6	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 Vac, 60 s	P
	- no breakdown or flashover	See appended TABLE 8	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.	760 Vac L1: 0,008 mA L2: 0,009 mA L3: 0,008 mA N: 0,006mA	P
8.3.3.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended TABLE 1 All phase poles are loaded	P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	Max: 62 K	P
	conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm^2 x 2	P
	test current Ie (A) :	1000 A	P
8.3.3.8	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	1,45 kA (1,45 x 1,0 x In) tr: 30 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	8 min 04 s	P
8.3.3.9	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -	266 Vac was applied, ACB not tripped, tested at 50 Hz and 60 Hz	P
	and shall operate at 35% of the maximum control supply voltage.	140 Vac was applied, ACB tripped, tested at 50 Hz and 60 Hz	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control supply voltage. Test made at room temperature.	266 Vac was applied, ACB tripped, tested at 50 Hz and 60 Hz	P
8.3.3.10	Verification of the main contact position for circuit-breakers for isolation		P
	actuating force for opening (N) .....:		—
	test force with blocked main contacts for 10 s (N) .:		—
	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		P
	Three attempts to operate the equipment by the stored energy.	The open position was not indicated during and after the test.	P
	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

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

8.3.3	**TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS** CDW3-1000N, 1000 A, 3 poles, equipped with trip unit of iTR326H, sample no. 2#		
8.3.3.2	Test of tripping limits and characteristic		
8.3.3.2.2	Short circuit releases		
	Manufacturer's name or trademark	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	2#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	Ambient temperature 10-40 °C :	22 / 23 / 24 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Range of adjustable setting current. (A)	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Time delay stated by the manufacturer, in the case of definite time delay releases.	tsd: 0,1 s - 0,4 s tg: 0,1 - 0,4 s 0,1 s, with tolerance of 80 ms - 140 ms 0,4 s, with tolerance of 350 ms - 500 ms	P
	Electromagnetic over current 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

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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 over current releases		
	For circuit-breakers with an electronic over current release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		P
	Test current: 80% of the rated, or **minimum** adjustable setting current: (A)	Ii: 0,8 x 2 x In L1: 1,61 kA L2: 1,61 kA L3: 1,61 kA Isd: 0,8 x 1,5 x 0,4 x In tsd: 0,1 s L1: 483 A L2: 483 A L3: 483 A Ig: 0,8 x 0,2 x In tg: 0,1 s L1: 181 A L2: 181 A L3: 181 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping -	P

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: L3: N:	tsd: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping - tg: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping -	P
	Test current: 120% of the rated, or **minimum** adjustable setting current: (A)	Ii: 1,2 x 2 x In L1: 2,41 kA L2: 2,41 kA L3: 2,41 kA Isd: 1,2 x 1,5 x 0,4 x In tsd: 0,1 s L1: 721 A L2: 721 A L3: 721 A Ig: 1,2 x 0,2 x In tg: 0,1 s L1: 221 A L2: 221 A L3: 221 A	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 35 ms 38 ms 34 ms -	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N: L1: L2: L3: N:	Isd: 111 ms 109 ms 106 ms - Ig: 104 ms 108 ms 107 ms -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 80% of the **maximum** adjustable setting current: (A)	Ii: 0,8 x 15 x In L1: 12,1 kA L2: 12,1 kA L3: 12,1 kA Isd: 0,8 x 10 x 1,0 x In tsd: 0,4 s L1: 8,03 kA L2: 8,03 kA L3: 8,03 kA Ig: 0,8 x 1 x In tg: 0,4 s L1: 903 A L2: 903 A L3: 903 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping -	P
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N: L1: L2: L3: N:	tsd: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping - tg: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 120% of the **maximum** adjustable setting current: (A)	Ii: 1,2 x 15 x In L1: 18,0 kA L2: 18,0 kA L3: 18,0 kA Isd: 1,2 x 10 x 1,0 x In tsd: 0,4 s L1: 12,1 kA L2: 12,1 kA L3: 12,1 kA Ig: 1,2 x 1 x In tg: 0,4 s L1: 1,10 kA L2: 1,10 kA L3: 1,10 kA	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 38 ms 37 ms 34 ms -	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N: L1: L2: L3: N:	Isd: 415 ms 418 ms 415 ms - Ig: 425 ms 420 ms 418 ms -	P
8.3.3.2.3	Overload releases		
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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the rated, or minimum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		
	Manufacturer's name or trademark	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	2#	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	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:	23 °C	P
	Range of adjustable setting current: (A)	Ir: (0,4 - 1) x 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)	421 A (1,05 x 0,4 x In) tr: 1 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the rated, or **minimum** adjustable setting current: (A)	522 A (1,3 x 0,4 x In) tr: 1 s	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	21,6 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 105% of the **maximum** adjustable setting current: (A)	1,06 Ak (1,05 x 1,0 x In) tr: 30 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the **maximum** adjustable setting current: (A)	1,31 kA (1,3 x 1,0 x In) tr: 30 s	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	10 min 10 s	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
	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

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

	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	Requirement for thermal-magnetic release	N/A
	Test ambient air temperature:	23 °C	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Minimum setting: 801 A (2 x 0,4 x In) tr: 1,0 s	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	8,9 s Tripping time specified by the manufacturer: 8,1 s ≤ t ≤ 9,9 s	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Maximum setting: 2,00 kA (2 x 1,0 x In) tr: 30 s	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	4 min 19 s Tripping time specified by the manufacturer: 243 s ≤ t ≤ 297 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:	Requirement for thermal-magnetic release	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)	Requirement for thermal-magnetic release	N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	Requirement for thermal-magnetic release	N/A

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

8.3.3.2.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	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		P
	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.		P
	Test current: 1,5 times of the rated, or **minimum** adjustable setting current: (A)	Isd: 902 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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:	107 ms	P
	Time-delay: between the limits stated by the manufacturer:	80 ms - 140 ms	P
	Test current: 1,5 times of the **maximum** adjustable setting current: (A)	Isd: 15,1 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	Operating time, overload releases: (s)		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 (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)L L2: L3:	 419 ms	P
	Time-delay: between the limits stated by the manufacturer:	350 ms - 500 ms	P
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		P
	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.		P
	Test current: 1,5 times of the **minimum** adjustable setting current: (A)	Isd: 903 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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)	80 ms	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,2 s, non-tripping Reduced to 401 A	P
	Rated current	400 A (set at 0,4 x In)	P
	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:	0,2 s, non-tripping	P
	Test current: 1,5 times of **maximum** adjustable setting current: (A)	Isd: 15,2 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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)	350 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,8 s, non-tripping Reduced to 1000 A	P
	Rated current	1000 A (set at 1,0 x In)	P
	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:	0,8 s, non-tripping	P

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

8.3.3.3	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
8.3.3.4 part1	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		
	- rated impulse withstand voltage (kV) :	12 kV for main circuit 4 kV for control circuit	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	15,0 kV	P
	- test Uimp auxiliary circuits (kV) :		N/A
	- test Uimp control circuits (kV) :	4,8 kV	P
	- test Uimp on open main contacts (equipment suitable for isolating) (kV) :	18,5 kV	P
a)	Application of test voltage		P
	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		P
	- other circuits		P
	- exposed conductive parts		P
	- enclosure of mounting plate		P
	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) :	1000 Vac for main circuit 690 Vac for control circuit	P
	- main circuits, test voltage for 1 min (V)	2200 Vac, 60 s	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- control circuits, test voltage for 1 min (V)	1890 Vac, 60 s	P
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.		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		P
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.		P
	No unintentional disruptive discharge during the tests		P
(i)	the normal positions of operation include the tripped position, if any;		P
(ii)	circuits incorporating solid-state devices connected to the main circuit shall be disconnected for the test;		N/A
(iii)	circuit-breakers not declared as suitable for isolation shall be tested with the test voltage applied across the poles of the main circuit, the line terminals being connected together and the load terminals being connected together.		N/A
(iv)	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 Ue, and shall not exceed 0,5mA.	759 Vac L1: 0,005 mA L2: 0,005 mA L3: 0,005 mA	P
(v)	circuit-breakers having a rated insulation voltage greater than 1 000 V a.c. shall be tested at a voltage of Ui + 1 200 V a.c. r.m.s. or 2 Ui whichever is the greater		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
(vi)	withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		P
8.3.3.4	Mechanical operation and operational performance capability		
8.3.3.4.2	Construction and mechanical operation		
8.3.3.4.2.1	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.2		P
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		P
8.3.3.4.2.2	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.4		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.	Stored energy motor (220 / 230 Vac): 187 - 253 Vac tested at 50 Hz and 60 Hz	P
	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		P
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
8.3.3.4.2.3	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable	Undervoltage release with rated voltage 220 / 230 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified	Operating limits: 77 - 161 Vac tested at 50 Hz and 60 Hz	P
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		P
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil	drop out voltage: 125 Vac tested at 50 Hz 127 Vac tested at 60 Hz	P
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range	starts from: 230 Vac tested at 50 Hz and 60 Hz	P
	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	drop out voltage: 120 Vac (from 220 Vac) tested at 50 Hz 121 Vac (from 220 Vac) tested at 60 Hz 123 Vac (from 230 Vac) tested at 50 Hz 123 Vac (from 230 Vac) tested at 60 Hz	P
	This test may be combined with the temperature-rise test of 8.3.3.7		P
	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	starts from: 220 Vac / 230 Vac	P
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	69,0 Vac was applied ACB cannot be closed tested at 50 Hz and 60 Hz	P
	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	187 Vac was applied ACB can be closed tested at 50 Hz and 60 Hz	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
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	253 Vac tested at 50 Hz and 60 Hz	P
8.3.3.4.2.4	Shunt releases		
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable	220 / 230 Vac 154 Vac and 253 Vac were applied, ACB tripped tested at 50 Hz and 60 Hz	P
	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	154 Vac was applied, ACB tripped tested at 50 Hz and 60 Hz	P
	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		P
8.3.3.4.3	Operational performance capability without current.		
	Type designation or serial number	CDW3-1000N	
	Sample no:	2#	
	Rated current In (A)	1000 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage undervoltage releases: Uc (V)	220 / 230 Vac	
	Ambient temperature 10-40 °C :	23 °C	P
	Number of operating cycles per hour	20 cycles per hour	P
	Number of cycles without current (total) (closing releases energized at the rated Uc)	2500	P
	Number of cycles without current (without releases)	2000	P
	Applied voltage of closing releases (V)	220 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	250	P
	Applied voltage: shunt releases (V)	230 Vac	P
	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	250	P
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		P
	Applied voltage: undervoltage releases (V)	220 Vac	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		P
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		P
8.3.3.4.4	Operational performance capability with current.		
	Rated current: In (A)	1000 A	
	Maximum rated operational voltage: Ue (V)	690 Vac	
	Conductor cross-sectional area (mm²) :	240 mm^2 x 2	P
	Number of operating cycles per hour	20	P
	Number of cycles with current (total) (closing releases energized at the rated Uc)	500	P
	Applied voltage: closing releases (V)	220 Vac	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.	Ir: 1 x In, tr: 30 s Ii: 2 x In Isd: 1,5 x Ir, tsd: 0,1 s	P
	Conditions, make/break operations:		P
	- test voltage U/Ue = 1,0 (V) .....L1-L2: .....L2-L3: L1-L3:	692 Vac 692 Vac 693 Vac	P
	- test current I/Ie = 1,0 (A) .....L1: .....L2: L3:	1,01 kA 1,01 kA 1,02 kA	P
	- power factor/time constant:	0,81	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	Min 97 ms	P
	- off-time (s):	Max 179,9 s	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		P
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		P
8.3.3.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles : 100		P
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		P
8.3.3.5	Overload performance		
	this test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number		
	Sample no:		
	Rated current In (A)		
	Rated operational voltage: Ue (V)		
	Rated control supply voltage of closing releases: Uc (V)		
	Rated control supply voltage of shunt releases: Uc (V)		
	Rated control supply voltage undervoltage releases: Uc (V)		
	Ambient temperature 10-40 °C :		N/A
	Number of operating cycles per hour		N/A
	Maximum rated operational voltage: Ue (V)		N/A
	Number of operating cycles per hour		N/A
	Number of cycles with current (total) (closing releases energized at the rated Uc)		N/A
	Applied voltage: closing releases (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, overload operations:		N/A
	- test voltage U/Ue = 1,05 (V) .....L1: .....L2: L3:		N/A
	- test current AC/DC: I/Ie = 6,0/2.5 (A) .....L1: .....L2: L3:		N/A
	- power factor/time constant:		N/A
	- Number of cycles manually opened: 9		N/A
	- Number of cycles automatically opened by an overload release: 3		N/A
	for circuit-breakers having a short-circuit release of a maximum setting less than the test current		
	all 12 operations automatic		N/A
	If the testing means do not withstand the let-through energy occurring during the automatic operation		
	– 12 manual operations – three additional operations with automatic opening, made at any convenient voltage		N/A
	- frequency: (Hz)		N/A
	- on-time max 2s:		N/A
	Operating rate if different from Table 8		N/A
8.3.3.6	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 Vac, 60 s	P
	- no breakdown or flashover	See appended TABLE 8	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.	760 Vac L1: 0,008 mA L2: 0,009 mA L3: 0,008 mA	P
8.3.3.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended TABLE 2 All phase poles are loaded	P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	Max: 67 K	P
	conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	test current Ie (A) :	1000 A	P
8.3.3.8	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	1,45 kA (1,45 x 1,0 x In) tr: 30 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	8 min 04 s	P
8.3.3.9	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control supply voltage -	154 Vac was applied, ACB not tripped, tested at 50 Hz and 60 Hz	P
	and shall operate at 35% of the maximum control supply voltage.	80,5 Vac was applied, ACB tripped, tested at 50 Hz and 60 Hz	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.	154 Vac was applied, ACB tripped, tested at 50 Hz and 60 Hz	P
8.3.3.10	Verification of the main contact position for circuit-breakers for isolation		P
	actuating force for opening (N) .....:		—
	test force with blocked main contacts for 10 s (N) .:		—
	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		P
	Three attempts to operate the equipment by the stored energy.	The open position was not indicated during and after the test.	P
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	**TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS** CDW3-1000N, 1000 A, 4 poles, equipped with trip unit of iTR326, sample no. 3#		
8.3.3.2	Test of tripping limits and characteristic		
8.3.3.2.2	Short circuit releases		
	Manufacturer's name or trademark	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	3#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	Ambient temperature 10-40 °C :	22 / 23 / 24 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Range of adjustable setting current. (A)	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Time delay stated by the manufacturer, in the case of definite time delay releases.	tsd: 0,1 s - 0,4 s tg: 0,1 - 0,4 s 0,1 s, with tolerance of 80 ms - 140 ms 0,4 s, with tolerance of 350 ms - 500 ms	P
	Electromagnetic over current 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

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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
	Electronic over current releases		
	For circuit-breakers with an electronic over current release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		P
	Test current: 80% of the rated, or **minimum** adjustable setting current: (A)	Ii: 0,8 x 2 x In L1: 1,61 kA L2: 1,61 kA L3: 1,61 kA N: 1,60 kA Isd: 0,8 x 1,5 x 0,4 x In tsd: 0,1 s L1: 482 A L2: 482 A L3: 482 A N: 480 A Ig: 0,8 x 0,2 x In tg: 0,1 s L1: 181 A L2: 181 A L3: 181 A N: 181 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P

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: L3: N: L1: L2: L3: N:	tsd: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping tg: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P
	Test current: 120% of the rated, or **minimum** adjustable setting current: (A)	Ii: 1,2 x 2 x In L1: 2,42 kA L2: 2,42 kA L3: 2,42 kA N: 2,41 kA Isd: 1,2 x 1,5 x 0,4 x In tsd: 0,1 s L1: 722 A L2: 722 A L3: 722 A N: 721 A Ig: 1,2 x 0,2 x In tg: 0,1 s L1: 222 A L2: 222 A L3: 222 A N: 222 A	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 43 ms 35 ms 38 ms 39 ms	P

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: L3: N:	 Isd: 110 ms 109 ms 109 ms 104 ms Ig: 105 ms 105 ms 108 ms 109 ms	P
	Test current: 80% of the **maximum** adjustable setting current: (A)	Ii: 0,8 x 15 x In L1: 12,0 kA L2: 12,0 kA L3: 12,0 kA N: 12,1 kA Isd: 0,8 x 10 x 1,0 x In tsd: 0,4 s L1: 8,02 kA L2: 8,02 kA L3: 8,02 kA N: 8,00 kA Ig: 0,8 x 1 x In tg: 0,4 s L1: 901 A L2: 901 A L3: 901 A N: 901 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P

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: L3: N: L1: L2: L3: N:	tsd: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping tg: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping	P
	Test current: 120% of the **maximum** adjustable setting current: (A)	Ii: 1,2 x 15 x In L1: 18,2 kA L2: 18,2 kA L3: 18,2 kA N: 18,1 kA Isd: 1,2 x 10 x 1,0 x In tsd: 0,4 s L1: 12,2 kA L2: 12,2 kA L3: 12,2 kA N: 12,0 kA Ig: 1,2 x 1 x In tg: 0,4 s L1: 1,11 kA L2: 1,11 kA L3: 1,11 kA N: 1,11 kA	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 40 ms 40 ms 37 ms 36 ms	P

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: L3: N:	Isd: 424 ms 427 ms 419 ms 417 ms Ig: 423 ms 418 ms 421 ms 422 ms	P
8.3.3.2.3	Overload releases		
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	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	3#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	23 °C	P
	Range of adjustable setting current: (A)	Ir: (0,4 - 1) x 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)	For phase poles: 421 A (1,05 x 0,4 x In) For N pole: 421 A (1,05 x 0,4 x In) tr: 1 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the rated, or **minimum** adjustable setting current: (A)	522 A (1,3 x 0,4 x In) tr: 1 s	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.	625 A (1,2 x 1,3 x 0,4 x In) tr: 1 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	8,9 s for phase poles 14,7 s for N pole	P
	Test current: 105% of the **maximum** adjustable setting current: (A)	For phase poles: 1,06 kA (1,05 x 1,0 x In) For N pole: 1,05 kA (1,05 x 1,0 x In) tr: 30 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the **maximum** adjustable setting current: (A)	1,30 kA (1,3 x 1,0 x In) tr: 30 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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.	1,57 kA (1,2 x 1,3 x 1,0 x In) tr: 30 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	10 min 03 s for phase poles 7 min 05 s for N pole	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
	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	Requirement for thermal-magnetic release	N/A
	Test ambient air temperature:	23 °C	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Minimum setting: 802 A (2 x 0,4 x In) tr: 1,0 s	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	8,9 s Tripping time specified by the manufacturer: 8,1 s ≤ t ≤ 9,9 s	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Maximum setting: 2,00 kA (2 x 1,0 x In) tr: 30 s	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	4 min 19 s Tripping time specified by the manufacturer: 243 s ≤ t ≤ 297 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:	Requirement for thermal-magnetic release	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)	Requirement for thermal-magnetic release	N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	Requirement for thermal-magnetic release	N/A
8.3.3.2.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	short-circuit releases		P
	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.		P
	Test current: 1,5 times of the rated, or **minimum** adjustable setting current: (A)	Isd: 904 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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:	106 ms	P
	Time-delay: between the limits stated by the manufacturer:	80 ms - 140 ms	P
	Test current: 1,5 times of the **maximum** adjustable setting current: (A)	Isd: 15,1 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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)L L2: L3:	422 ms	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time-delay: between the limits stated by the manufacturer:	350 ms - 500 ms	P
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		P
	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.		P
	Test current: 1,5 times of the **minimum** adjustable setting current: (A)	Isd: 903 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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)	80 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,2 s, non-tripping Reduced to 402 A	P
	Rated current	400 A (set at 0,4 x In)	P
	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:	0,2 s, non-tripping	P
	Test current: 1,5 times of **maximum** adjustable setting current: (A)	Isd: 15,1 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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)	350 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,8 s, non-tripping Reduced to 1000 A	P
	Rated current	1000 A (set at 1,0 x In)	P
	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:	0,8 s, non-tripping	P

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

8.3.3	**TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS** CDW3-1000N, 1000 A, 4 poles, equipped with trip unit of Genius 4.0A, sample no. 4#		
8.3.3.2	Test of tripping limits and characteristic		
8.3.3.2.2	Short circuit releases		
	Manufacturer's name or trademark	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	4#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	Ambient temperature 10-40 °C :	23 / 24 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Range of adjustable setting current. (A)	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Time delay stated by the manufacturer, in the case of definite time delay releases.	tsd: 0,1 s - 0,4 s tg: 0,1 - 0,4 s 0,1 s, with tolerance of 80 ms - 140 ms 0,4 s, with tolerance of 350 ms - 500 ms	P
	Electromagnetic over current 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

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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 over current releases		
	For circuit-breakers with an electronic over current release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		P
	Test current: 80% of the rated, or **minimum** adjustable setting current: (A)	Ii: 0,8 x 2 x In L1: 1,61 kA L2: 1,61 kA L3: 1,61 kA N: 1,60 kA Isd: 0,8 x 1,5 x 0,4 x In tsd: 0,1 s L1: 481 A L2: 481 A L3: 481 A N: 480 A Ig: 0,8 x 0,2 x In tg: 0,1 s L1: 181 A L2: 181 A L3: 181 A N: 181 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P

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: L3: N: L1: L2: L3: N:	tsd: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping tg: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P
	Test current: 120% of the rated, or **minimum** adjustable setting current: (A)	Ii: 1,2 x 2 x In L1: 2,41 kA L2: 2,41 kA L3: 2,41 kA N: 2,42 kA Isd: 1,2 x 1,5 x 0,4 x In tsd: 0,1 s L1: 722 A L2: 722 A L3: 722 A N: 721 A Ig: 1,2 x 0,2 x In tg: 0,1 s L1: 220 A L2: 220 A L3: 220 A N: 220 A	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 33 ms 38 ms 37 ms 40 ms	P

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: L3: N:	 Isd: 109 ms 114 ms 110 ms 106 ms Ig: 105 ms 107 ms 107 ms 109 ms	P
	Test current: 80% of the **maximum** adjustable setting current: (A)	Ii: 0,8 x 15 x In L1: 12,1 kA L2: 12,1 kA L3: 12,1 kA N: 12,0 kA Isd: 0,8 x 10 x 1,0 x In tsd: 0,4 s L1: 8,02 kA L2: 8,02 kA L3: 8,02 kA N: 8,01 kA Ig: 0,8 x 1 x In tg: 0,4 s L1: 901 A L2: 901 A L3: 901 A N: 901 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P

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: L3: N: L1: L2: L3: N:	tsd: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping tg: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping	P
	Test current: 120% of the **maximum** adjustable setting current: (A)	Ii: 1,2 x 15 x In L1: 18,2 kA L2: 18,2 kA L3: 18,2 kA N: 18,1 kA Isd: 1,2 x 10 x 1,0 x In tsd: 0,4 s L1: 12,1 kA L2: 12,1 kA L3: 12,1 kA N: 12,1 kA Ig: 1,2 x 1 x In tg: 0,4 s L1: 1,11 kA L2: 1,11 kA L3: 1,11 kA N: 1,11 kA	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 36 ms 41 ms 39 ms 41 ms	P

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: L3: N:	Isd: 422 ms 418 ms 421 ms 424 ms Ig: 416 ms 420 ms 420 ms 421 ms	P
8.3.3.2.3	Overload releases		
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	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	4#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	24 °C	P
	Range of adjustable setting current: (A)	Ir: (0,4 - 1) x 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)	For phase poles: 421 A (1,05 x 0,4 x In) For N pole: 421 A (1,05 x 0,4 x In) tr: 1 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the rated, or **minimum** adjustable setting current: (A)	523 A (1,3 x 0,4 x In) tr: 1 s	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.	801 A (1,2 x 1,3 x 0,4 x In) tr: 1 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	21,0 s for phase poles 14,6 s for N pole	P
	Test current: 105% of the **maximum** adjustable setting current: (A)	For phase poles: 1,06 kA (1,05 x 1,0 x In) For N pole: 1,05 kA (1,05 x 1,0 x In) tr: 30 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the **maximum** adjustable setting current: (A)	1,30 kA (1,3 x 1,0 x In) tr: 30 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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.	1,56 kA (1,2 x 1,3 x 1,0 x In) tr: 30 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	10 min 01 s for phase poles 6 min 59 s for N pole	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
	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	Requirement for thermal-magnetic release	N/A
	Test ambient air temperature:	24 °C	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Minimum setting: 801 A (2 x 0,4 x In) tr: 1,0 s	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	8,9 s Tripping time specified by the manufacturer: 8,1 s ≤ t ≤ 9,9 s	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Maximum setting: 2,01 kA (2 x 1,0 x In) tr: 30 s	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	4 min 18 s Tripping time specified by the manufacturer: 243 s ≤ t ≤ 297 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:	Requirement for thermal-magnetic release	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)	Requirement for thermal-magnetic release	N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	Requirement for thermal-magnetic release	N/A
8.3.3.2.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	short-circuit releases		P
	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.		P
	Test current: 1,5 times of the rated, or **minimum** adjustable setting current: (A)	Isd: 903 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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:	107 ms	P
	Time-delay: between the limits stated by the manufacturer:	80 ms - 140 ms	P
	Test current: 1,5 times of the **maximum** adjustable setting current: (A)	Isd: 15,1 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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)L L2: L3:	417 ms	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time-delay: between the limits stated by the manufacturer:	350 ms - 500 ms	P
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		P
	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.		P
	Test current: 1,5 times of the **minimum** adjustable setting current: (A)	Isd: 903 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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)	80 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,2 s, non-tripping Reduced to 401 A	P
	Rated current	400 A (set at 0,4 x In)	P
	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:	0,2 s, non-tripping	P
	Test current: 1,5 times of **maximum** adjustable setting current: (A)	Isd: 15,2 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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)	350 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,8 s, non-tripping Reduced to 1000 A	P
	Rated current	1000 A (set at 1,0 x In)	P
	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:	0,8 s, non-tripping	P

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

8.3.3	**TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS** CDW3-1000N, 1000 A, 4 poles, equipped with trip unit of Genius 4.0, sample no. 5#		
8.3.3.2	Test of tripping limits and characteristic		
8.3.3.2.2	Short circuit releases		
	Manufacturer's name or trademark	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	5#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	Ambient temperature 10-40 °C :	23 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Range of adjustable setting current. (A)	Ii: (2 - 15) x In Isd: (1,5 - 10) x Ir Ig: (0,2 - 1,0) x In	P
	Time delay stated by the manufacturer, in the case of definite time delay releases.	tsd: 0,1 s - 0,4 s tg: 0,1 - 0,4 s 0,1 s, with tolerance of 80 ms - 140 ms 0,4 s, with tolerance of 350 ms - 500 ms	P
	Electromagnetic over current 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

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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 over current releases		
	For circuit-breakers with an electronic over current release, the operation of the short-circuit releases shall be verified by one test only on each pole individually.		P
	Test current: 80% of the rated, or **minimum** adjustable setting current: (A)	Ii: 0,8 x 2 x In L1: 1,61 kA L2: 1,61 kA L3: 1,61 kA N: 1,60 kA Isd: 0,8 x 1,5 x 0,4 x In tsd: 0,1 s L1: 481 A L2: 481 A L3: 481 A N: 482A Ig: 0,8 x 0,2 x In tg: 0,1 s L1: 182 A L2: 182 A L3: 182 A N: 182 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P

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: L3: N: L1: L2: L3: N:	tsd: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping tg: 0,1 s, with tolerance of 80 ms - 140 ms 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P
	Test current: 120% of the rated, or **minimum** adjustable setting current: (A)	Ii: 1,2 x 2 x In L1: 2,41 kA L2: 2,41 kA L3: 2,41 kA N: 2,42 kA Isd: 1,2 x 1,5 x 0,4 x In tsd: 0,1 s L1: 721 A L2: 721 A L3: 721 A N: 722 A Ig: 1,2 x 0,2 x In tg: 0,1 s L1: 222 A L2: 222 A L3: 222 A N: 222 A	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 36 ms 34 ms 34 ms 39 ms	P

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: L3: N:	 Isd: 109 ms 106 ms 110 ms 109 ms Ig: 106 ms 103 ms 107 ms 108 ms	P
	Test current: 80% of the **maximum** adjustable setting current: (A)	Ii: 0,8 x 15 x In L1: 12,1 kA L2: 12,1 kA L3: 12,1 kA N: 12,0 kA Isd: 0,8 x 10 x 1,0 x In tsd: 0,4 s L1: 8,01 kA L2: 8,01 kA L3: 8,01 kA N: 8,01 kA Ig: 0,8 x 1 x In tg: 0,4 s L1: 901 A L2: 901 A L3: 901 A N: 901 A	P
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:	 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping 0,2 s non-tripping	P

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: L3: N: L1: L2: L3: N:	tsd: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping tg: 0,4 s, with tolerance of 350 ms - 500 ms 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping 0,8 s non-tripping	P
	Test current: 120% of the **maximum** adjustable setting current: (A)	Ii: 1,2 x 15 x In L1: 18,2 kA L2: 18,2 kA L3: 18,2 kA N: 18,2 kA Isd: 1,2 x 10 x 1,0 x In tsd: 0,4 s L1: 12,2 kA L2: 12,2 kA L3: 12,2 kA N: 12,1 kA Ig: 1,2 x 1 x In tg: 0,4 s L1: 1,11 kA L2: 1,11 kA L3: 1,11 kA N: 1,11 kA	P
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:	 56 ms 59 ms 58 ms 53 ms	P

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: L3: N:	Isd: 415 ms 418 ms 415 ms 420 ms Ig: 421 ms 416 ms 419 ms 420 ms	P
8.3.3.2.3	Overload releases		
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	DELIXI ELECTRIC	
	Type designation or serial number	CDW3-1000N	
	Sample no:	5#	
	Rated operational voltage: Ue (V)	220 / 230 / 240 / 380 / 400 / 415 / 440 / 480 / 500 / 525 / 550 / 660 / 690 Vac	
	Rated current: In (A)	1000 A	
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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:	24 °C	P
	Range of adjustable setting current: (A)	Ir: (0,4 - 1) x 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)	For phase poles: 421 A (1,05 x 0,4 x In) For N pole: 420 A (1,05 x 0,4 x In) tr: 1 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the rated, or **minimum** adjustable setting current: (A)	522 A (1,3 x 0,4 x In) tr: 1 s	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.	625 A (1,2 x 1,3 x 0,4 x In) tr: 1 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	20,9 s for phase poles 14,1 s for N pole	P
	Test current: 105% of the **maximum** adjustable setting current: (A)	For phase poles: 1,06 kA (1,05 x 1,0 x In) For N pole: 1,06 kA (1,05 x 1,0 x In) tr: 30 s	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2 h non-tripping	P
	Test current: 130% of the **maximum** adjustable setting current: (A)	1,31 kA (1,3 x 1,0 x In) tr: 30 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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.	1,56 kA (1,2 x 1,3 x 1,0 x In) tr: 30 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	10 min 08 s for phase poles 7 min 04 s for N pole	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
	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	Requirement for thermal-magnetic release	N/A
	Test ambient air temperature:	24 °C	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Minimum setting: 802 A (2 x 0,4 x In) tr: 1,0 s,	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	8,8 s Tripping time specified by the manufacturer: 8,1 s ≤ t ≤ 9,9 s	P
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)	Maximum setting: 2,01 kA (2 x 1,0 x In) tr: 30 s,	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	4 min 16 s Tripping time specified by the manufacturer: 243 s ≤ t ≤ 297 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:	Requirement for thermal-magnetic release	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)	Requirement for thermal-magnetic release	N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	Requirement for thermal-magnetic release	N/A
8.3.3.2.4	Additional test for definite time-delay releases		
a)	Time delay		
	Test is made at a current equal to 1,5 times the current setting. If the test current overlaps with another tripping characteristic (e.g. an instantaneous tripping characteristic), the trip setting and the test current shall be reduced as necessary to prevent premature tripping.		
	overload releases: (all phase poles loaded)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	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.		P
	Test current: 1,5 times of the rated, or **minimum** adjustable setting current: (A)	Isd: 902 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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:	105 ms	P
	Time-delay: between the limits stated by the manufacturer:	80 ms - 140 ms	P
	Test current: 1,5 times of the **maximum** adjustable setting current: (A)	Isd: 15,1 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, short-circuit releases (electronic): (s)L L2: L3:	 413 ms	P
	Time-delay: between the limits stated by the manufacturer:	350 ms - 500 ms	P
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		P
	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.		P
	Test current: 1,5 times of the **minimum** adjustable setting current: (A)	Isd: 901 A (1,5 x 1,5 x 0,4 x In) tsd: 0,1 s	P
	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)	80 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,2 s, non-tripping Reduced to 402 A	P
	Rated current	400 A (set at 0,4 x In)	P
	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:	0,2 s, non-tripping	P
	Test current: 1,5 times of **maximum** adjustable setting current: (A)	Isd: 15,2 kA (1,5 x 10 x 1,0 x In) tsd: 0,4 s	P
	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)	350 ms	P
	Time duration of current when reduced to the rated current: shall be twice the delay-time stated by the manufacturer: (s)	0,8 s, non-tripping Reduced to 1000 A	P
	Rated current	1000 A (set at 1,0 x In)	P
	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:	0,8 s, non-tripping	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	**TEST SEQUENCE II (Ics): Rated service short-circuit breaking capacity** CDW3-1000N, 200 A, 4P, equipped with trip unit of iTR326A, sample no. 6#, 3 phases test		
8.3.4.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	CDW3-1000N	
	Sample no:	6#	
	Rated current: In (A)	200 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	30 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 0,4 x In, tr: 1 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm Up / down: 0 mm Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	95 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)	Upside	P
	Tightening torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Ue = 1,05 (V)..... L1-L2: ..... L2-L3: L3-L1:	436 Vac 436 Vac 436 Vac	P
	- r.m.s. test current AC/DC: (A) ..... L1: ..... L2: L3:	 30,8 kA 31,0 kA 30,9 kA	P
	power factor/time constant :	0,25	P
	- Factor ”n”	2,1	P
	- peak test current (A) :	63,8 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	62,3 kA 46,5 kA 54,4 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	34,3 MA²s 27,3 MA²s 24,9 MA²s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	60,2 kA 44,5 kA 58,1 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	31,9 MA²s 23,6 MA²s 26,9 MA²s	P
	Pause, t: (min)	3 min	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	59,1 kA 46,0 kA 59,8 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	25,1 MA²s 15,9 MA²s 23,3 MA²s	P
	Melting of the fusible element	No melting	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence ”O”	No hole	P
	Cracks observed	No crack	P
8.3.4.3	Operational performance capability with current.		
	Rated current: In (A)		
	Maximum rated operational voltage: Ue (V)		
	Conductor cross-sectional area (mm²) :		
	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 releases energized at the rated Uc)		N/A
	Applied voltage: closing releases (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: ..... L2-L3: L3-L1:		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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 V, 5 s	P
	- no breakdown or flashover	See appended TABLE 9	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	460 Vac L1: 0,016 mA L2: 0,015 mA L3: 0,013 mA N: -	P
8.3.4.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. ≤ 80 K (K) :		N/A
	conductor cross-sectional area (mm²) :		N/A
	test current Ie (A) :		N/A
8.3.4.6	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	116 A (1,45 x 0,4 x 200 A) tr: 1 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	16,7 s	P

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

8.3.4	**TEST SEQUENCE II/III (Ics=Icu):** CDW3-1000N, 1000 A, 4P, equipped with trip unit of Genius 4.0H, sample no. 7#, 3 phases test		
8.3.4.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or serial number	CDW3-1000N	
	Sample no:	7#	
	Rated current: In (A)	1000 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated service short-circuit breaking capacity: (kA)	25 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 1,0 x In, tr: 30 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm Up / down: 0 mm Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	If terminals unmarked: line connected at: (underside/upside)	Underside	P
	Tightening torques: (Nm)	50 Nm	P
8.3.5.2	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:	243 s ≤ t ≤ 297 s tr: 30 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	4 min 15 s 4 min 19 s 4 min 18 s -	P
8.3.4.2	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Ue = 1,05 (V).....L1-L2: .....L2-L3: L3-L1:	726 Vac 726 Vac 726 Vac	P
	- r.m.s. test current AC/DC: (A) .....L1: .....L2: L3:	 25,3 kA 25,5 kA 25,2 kA	P
	power factor/time constant :	0,25	P
	- Factor ”n”	2,1	P
	- peak test current (A) :	53,1 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	51,0 kA 34,8 kA 50,8 kA	P
	- Joule integral I²dt (A²s) .....L1: .....L2: L3:	16,0 MA²s 8,91 MA²s 16,4 MA²s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	49,3 kA 52,5 kA 33,4 kA	P
	- Joule integral I²dt (A²s) .....L1: .....L2: L3:	14,0 MA²s 17,3 MA²s 8,56 MA²s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	47,3 kA 52,9 kA 36,5 kA	P
	- Joule integral I²dt (A²s) .....L1: .....L2: L3:	12,1 MA²s 18,2 MA²s 8,81 MA²s	P
	Melting of the fusible element	No melting	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence ”O”	No hole	P
	Cracks observed	No crack	P
8.3.4.3	Operational performance capability with current.		
	Rated current: In (A)	1000 A	
	Maximum rated operational voltage: Ue (V)	690 Vac	
	Conductor cross-sectional area (mm²) :	240 mm^2 x 2	
	Number of operating cycles per hour	20 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing releases energized at the rated Uc)	25 cycles	P
	Applied voltage: closing releases (V)	220 Vac	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.	Ir: 1 x In, tr: 30 s, Ii: 2 x In, Isd: 1,5 x Ir, tsd: 0,1 s	P
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,0 (V) .....L1-L2: .....L2-L3: L3-L1:	692 Vac 692 Vac 693 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test current I/Ie = 1,0 (A) .....L1: .....L2: L3:	1,01 kA 1,01 kA 1,02 kA	P
	- power factor/time constant:	0,81	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	Min: 102 ms	P
	- off-time (s):	Max: 179,9 s	P
8.3.4.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1380 V, 60 s	P
	- no breakdown or flashover	See appended TABLE 10	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 Ue)	760 Vac L1: 0,007 mA L2: 0,009 mA L3: 0,008 mA N: -	P
8.3.4.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended TABLE 3	P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	Max: 78 K	P
	conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	test current Ie (A) :	1000 A	P
8.3.4.6	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	1,45 kA (1,45 x 1,0 x 1000 A) tr: 30 s	P
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	8 min 05 s	P
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 297 s tr: 30 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	2 min 41 s 2 min 43 s 2 min 40 s -	P

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

8.3.5	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** CDW3-1000N, 1000 A, 4P, equipped with trip unit of Genius 4.0, sample no. 8#, 3 phases test		
	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	CDW3-1000N	
	Sample no:	8#	
	Rated current: In (A)	1000 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	243 s ≤ t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	4 min 14 s 4 min 17 s 4 min 19 s -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 1,0 x In, tr: 30 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm Up / down: 0 mm Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	If terminals unmarked: line connected at: (underside/upside)	Upside	P
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	436 Vac 436 Vac 436 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) ..... L1: ..... L2: L3:	43,6 kA 43,5 kA 43,7 kA	P
	power factor/time constant :	0,25	P
	- Factor ”n”	2,1	P
	- peak test current (Amax) :	89,1 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	84,8 kA 67,7 kA 60,4 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	39,5 MA²s 26,2 MA²s 14,6 MA²s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	78,1 kA 44,9 kA 73,9 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	35,0 MA²s 12,8 MA²s 24,7 MA²s	P
	Melting of the fusible element	No melting	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence ”O”	No hole	P
	Cracks observed	No crack	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 Vac, 5 s	P
	- no breakdown or flashover	See appended TABLE 11	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	460 Vac L1: 0,017 mA L2: 0,013 mA L3: 0,009 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	2 min 40 s 2 min 44 s 2 min 39 s -	P

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

8.3.5	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** CDW3-1000N, 200 A, 4P, equipped with trip unit of Genius 4.0A, sample no. 9#, 3 phases test		
	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	CDW3-1000N	
	Sample no:	9#	
	Rated current: In (A)	200 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	8,1 s ≤ t ≤ 9,9 s tr: 1 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	8,7 s 8,9 s 8,6 s -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 0,4 x In, tr: 1 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm Up / down: 0 mm Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	95 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)	Upside	P
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) .....L1-L2: .....L2-L3: L1-L3:	436 Vac 436 Vac 436 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A)..... L1: ..... L2: L3:	43,6 kA 43,5 kA 43,7 kA	P
	power factor/time constant :	0,25	P
	- Factor ”n”	2,1	P
	- peak test current (Amax) :	89,1 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	87,4 kA 69,0 kA 73,1 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	60,6 MA²s 49,0 MA²s 42,4 MA²s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	76,8 kA 67,3 kA 78,2 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	55,8 MA²s 45,7 MA²s 49,7 MA²s	P
	Melting of the fusible element	No melting	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence ”O”	No hole	P
	Cracks observed	No crack	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 Vac, 5 s	P
	- no breakdown or flashover	See appended TABLE 11	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	460 Vac L1: 0,016 mA L2: 0,013 mA L3: 0,011 mA	P

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

8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 9,9 s tr: 1 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	5,5 s 5,7 s 5,7 s -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** CDW3-1000N, 1000 A, 4P, equipped with trip unit of Genius 4.0, sample no. 10# Test for phase + N		
	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	CDW3-1000N	
	Sample no:	10#	
	Rated current: In (A)	1000 A	
	Rated operational voltage: Ue (V)	415 Vac tested at 415 Vac / √3	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA Tested at 60% Icu: 25,2 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	tripping time: 243 s ≤ t ≤ 297 s tr: 30 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	4 min 18 s 4 min 19 s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 1,0 x In, tr: 30 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm Up / down: 0 mm Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	If terminals unmarked: line connected at: (underside/upside)	Upside	P
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test voltage U/Ue = 1,05 (V) ..... L1-N: ..... L2: L3:	252 Vac	P
	- r.m.s. test current AC/DC: (A) ..... L1: ..... L2: L3:	26,1 kA	P
	power factor/time constant :	0,25	P
	- Factor ”n”	2,1	P
	- peak test current (Amax) :	55,3 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	46,3 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	14,5 MA²s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	46,1 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	14,4 MA²s	P
	Melting of the fusible element	No melting	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence ”O”	No hole	P
	Cracks observed	No crack	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 Vac, 5 s	P
	- no breakdown or flashover	See appended TABLE 11	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	460 Vac L1: 0,017 mA N: 0,012 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	tripping time: t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	2 min 44 s 2 min 41 s	P

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

8.3.5	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** CDW3-1000N, 200 A, 4P, equipped with trip unit of iTR326A sample no. 11#, test for phase + N		
	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	CDW3-1000N	
	Sample no:	11#	
	Rated current: In (A)	200 A	
	Rated operational voltage: Ue (V)	415 Vac tested at 415 Vac / √3	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA Tested at 60% Icu: 25,2 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	8,1 s ≤ t ≤ 9,9 s tr: 1,0 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	8,9 s 8,7 s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 0,4 x In, tr: 1 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm Up / down: 0 mm Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	95 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)	Upside	P
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test voltage U/Ue = 1,05 (V) ..... L1-N: ..... L2: L3:	252 Vac	P
	- r.m.s. test current AC/DC: (A) ..... L1: ..... L2: L3:	26,1 kA	P
	power factor/time constant :	0,25	P
	- Factor ”n”	2,1	P
	- peak test current (Amax) :	55,3 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	46,3 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	16,0 MA²s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	44,9 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	13,0 MA²s	P
	Melting of the fusible element	No melting	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence ”O”	No hole	P
	Cracks observed	No crack	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 Vac, 5 s	P
	- no breakdown or flashover	See appended TABLE 11	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	460 Vac L1: 0,016 mA N: 0,012 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 9,9 s tr: 1,0 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	5,6 s 5,6 s	P

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

8.3.5	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** CDW3-1000N, 1000 A, 4P, equipped with trip unit of Genius 4.0H, sample no. 12#, test for phase + N		
	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	CDW3-1000N	
	Sample no:	12#	
	Rated current: In (A)	1000 A	
	Rated operational voltage: Ue (V)	690 Vac tested at 690 Vac / √3	
	Rated ultimate short-circuit breaking capacity: (kA)	25 kA Tested at 60% Icu: 15 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	243 s ≤ t ≤ 297 s tr: 30 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	4 min 19 s 4 min 14 s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 1,0 x In, tr: 30 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm Up / down: 0 mm Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	If terminals unmarked: line connected at: (underside/upside)	Underside	P
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test voltage U/Ue = 1,05 (V) ..... L1-N: ..... L2: L3:	436 Vac	P
	- r.m.s. test current AC/DC: (A) ..... L1: ..... L2: L3:	15,5 kA	P
	power factor/time constant :	0,30	P
	- Factor ”n”	2,0	P
	- peak test current (Amax) :	31,2 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	29,7 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	7,00 MA²s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	24,8 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	6,13 MA²s	P
	Melting of the fusible element	No melting	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence ”O”	No hole	P
	Cracks observed	No crack	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1380 Vac, 5 s	P
	- no breakdown or flashover	See appended TABLE 12	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	760 Vac L1: 0,017 mA N: 0,011 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	2 min 42 s 2 min 39 s	P

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

8.3.5	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** CDW3-1000N, 1000 A, 3P, equipped with trip unit of iTR326, sample no. 13#		
	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	CDW3-1000N	
	Sample no:	13#	
	Rated current: In (A)	1000 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	42 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	This test sequence need not be made when Icu = Ics		
8.3.5.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	243 s ≤ t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	4 min 14 s 4 min 16 s 4 min 17 s -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 1,0 x In, tr: 30 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm Up / down: 0 mm Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	If terminals unmarked: line connected at: (underside/upside)	Upside	P
	Tightening, torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	436 Vac 436 Vac 436 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current AC/DC: (A) ..... L1: ..... L2: L3:	43,6 kA 43,5 kA 43,7 kA	P
	power factor/time constant :	0,25	P
	- Factor ”n”	2,1	P
	- peak test current (Amax) :	89,1 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	85,1 kA 66,1 kA 65,4 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	42,5 MA²s 19,3 MA²s 24,3 MA²s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	62,7 kA 65,5 kA 84,5 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	22,4 MA²s 17,3 MA²s 39,7 MA²s	P
	Melting of the fusible element	No melting	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence ”O”	No hole	P
	Cracks observed	No crack	P
8.3.5.4	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1000 Vac, 60 s	P
	- no breakdown or flashover	See appended TABLE 11	P
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1,1 Ue)	460 Vac L1: 0,016 mA L2: 0,015 mA L3: 0,013 mA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.5	Verification of overload releases		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	tripping time: t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	2 min 44 s 2 min 41 s 2 min 42 s -	P

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

8.3.6.2	**TEST SEQUENCE IV (Icw): Rated short-time withstand current** CDW3-1000N, 1000 A, 4P, equipped with trip unit of Genius 4.0, sample no. 38#, 3 phases test		
	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 with an intentional short time delay at the assigned short time delay		
	Where integrally fused circuit-breaker are of utilization category B, they shall meet the requirements of this sequence.		
	Type designation or serial number	CDW3-1000N	
	Sample no:	38#	
	Rated current: I_n (A)	1000 A	
	Rated operational voltage: Ue (V)	690 Vac	
	Rated short-time withstand current: (kA/s)	20 kA / 1 s	
	Rated frequency: (Hz)	50 / 60 Hz	
8.3.6.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	243 s ≤ t ≤ 297 s tr: 30 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	4 min 16 s 4 min 18 s 4 min 16 s -	P
8.3.6.3	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 Hz	P
	- duration of the test: (s)	1,05 s	P
	- power factor / time constant (ms):	0,30	P
	- factor ”n”	2,0	P
	- test voltage: (V) .....L1-L2: .....L2-L3: L3-L1:	726 Vac 726 Vac 726 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- r.m.s. test current: (kA).....L1: .....L2: L3:	20,5 kA 21,1 kA 20,6 kA	P
	- highest peak current: (kA)	41,4 kA	P
8.3.6.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended TABLE 4	P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	Max: 66 K	P
	conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	test current Ie (A) :	1001 A	P
8.3.6.5	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 s with tolerance of 350 ms - 500 ms	P
	- test voltage U/Ue = 1,05 (V) .....L1-L2: .....L2-L3: L3-L1:	726 Vac 726 Vac 726 Vac	P
	- r.m.s. test current AC/DC: (A) .....L1: .....L2: L3:	 20,5 kA 21,1 kA 20,6 kA	P
	- test frequency: (Hz)	50 Hz	P
	- power factor / time constant (ms):	0,30	P
	- factor ”n”	2,0	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	40,8 kA 30,8 kA 39,8 kA	P
	- Joule integral I²dt (A²s) .....L1: .....L2: L3:	173 MA²s 166 MA²s 170 MA²s	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 -	403 ms	P
	- the instantaneous override, if any, shall not operate.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	-Pause: t (s)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) .....L1: .....L2: L3:	31,4 kA 35,3 kA 41,2 kA	P
	- Joule integral I²dt (A²s) .....L1: .....L2: L3:	6,86 MA²s 6,92 MA²s 11,0 MA²s	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 -		N/A
	- 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.	16 kA	P
8.3.6.6	Verification of dielectric withstand		P
	- equal to twice the rated operational voltage with a minimum of 1000 V	1380 Vac, 5 s	
	- no breakdown or flashover	See appended TABLE 13	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.	760 Vac L1: 0,017 mA L2: 0,013 mA L3: 0,009 mA	P
8.3.6.7	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:	t ≤ 297 s tr: 30 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N :	2 min 41 s 2 min 44 s 2 min 43 s -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2	**TEST SEQUENCE IV (Icw): Rated short-time withstand current** CDW3-1000N, 1000 A, 4P, equipped with trip unit of iTR326, sample no. 15#, phase + N test		
	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 with an intentional short time delay at the assigned short time delay		
	Where integrally fused circuit-breaker are of utilization category B, they shall meet the requirements of this sequence.		
	Type designation or serial number	CDW3-1000N	
	Sample no:	15#	
	Rated current: I_n (A)	1000 A	
	Rated operational voltage: Ue (V)	415 Vac tested at 415 Vac / √3	
	Rated short-time withstand current: (kA/s)	30 kA / 1 s tested at 18 kA / 1 s	
	Rated frequency: (Hz)	50 / 60 Hz	
8.3.6.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	243 s ≤ t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: .....N :	4 min 15 s - - 4 min 19 s	P
8.3.6.3	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 Hz	P
	- duration of the test: (s)	1,01 s	P
	- power factor / time constant (ms):	0,30	P
	- factor ”n”	2,0	P
	- test voltage: (V) L1-N:	252 Vac	P
	- r.m.s. test current: (kA) L1-N:	18,7 kA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- highest peak current: (kA)	37,5 kA	P
8.3.6.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended TABLE 5	P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	Max: 57 K	P
	conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	test current Ie (A) :	1000 A	P
8.3.6.5	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 s with tolerance of 350 ms - 500 ms	P
	- test voltage U/Ue = 1,05 (V) L1-N:	252 Vac	P
	- r.m.s. test current AC/DC: (A) L1-N:	18,7 kA	P
	- test frequency: (Hz)	50 Hz	P
	- power factor / time constant (ms):	0,3	P
	- factor ”n”	2,0	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) L1-N:	34,3 kA	P
	- Joule integral I²dt (A²s) L1-N:	125 MA²s	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 -	408 ms	P
	- the instantaneous override, if any, shall not operate.		P
	-Pause: t (s)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) L1-N:	31,7 kA	P
	- Joule integral I²dt (A²s) L1-N:	9,18 MA²s	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 -		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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.	16 kA	P
8.3.6.6	Verification of dielectric withstand		P
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 Vac, 5 s	
	- no breakdown or flashover	See appended TABLE 14	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.	460 Vac L1: 0,016 mA L2: - L3: - N: 0,013 mA	P
8.3.6.7	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:	t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: .....N :	2 min 43 s - - 2 min 40 s	P

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

8.3.6.2	**TEST SEQUENCE IV (Icw): Rated short-time withstand current** CDW3-1000N, 1000 A, 4P, equipped with trip unit of Genius 4.0, sample no. 16#, phase + N test		
	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 with an intentional short time delay at the assigned short time delay		
	Where integrally fused circuit-breaker are of utilization category B, they shall meet the requirements of this sequence.		
	Type designation or serial number	CDW3-1000N	
	Sample no:	16#	
	Rated current: I_n (A)	1000 A	
	Rated operational voltage: Ue (V)	690 Vac tested at 690 Vac / √3	
	Rated short-time withstand current: (kA/s)	20 kA / 1 s tested at 12 kA / 1 s	
	Rated frequency: (Hz)	50 / 60 Hz	
8.3.6.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	243 s ≤ t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	4 min 14 s - - 4 min 20 s	P
8.3.6.3	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 Hz	P
	- duration of the test: (s)	1,00 s	P
	- power factor / time constant (ms):	0,3	P
	- factor ”n”	2,0	P
	- test voltage: (V) L1-N:	436 Vac	P
	- r.m.s. test current: (kA) L1-N:	12,5 kA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- highest peak current: (kA)	25,1 kA	P
8.3.6.4	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 7.	See appended TABLE 6	P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	Max: 49 K	P
	conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	test current Ie (A) :	1000 A	P
8.3.6.5	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 s with tolerance of 350 ms - 500 ms	P
	- test voltage U/Ue = 1,05 (V) L1-N:	436 Vac	P
	- r.m.s. test current AC/DC: (A) L1-N:	12,5 kA	P
	- test frequency: (Hz)	50 Hz	P
	- power factor / time constant (ms):	0,3	P
	- factor ”n”	2,0	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) L1-N:	19,1 kA	P
	- Joule integral I²dt (A²s) L1-N:	57,5 MA²s	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 -	425 ms	P
	- the instantaneous override, if any, shall not operate.		P
	-Pause: t (s)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) L1-N:	23,4 kA	P
	- Joule integral I²dt (A²s) L1-N:	59,5 MA²s	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 -	412 ms	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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.	16 kA	N/A
8.3.6.6	Verification of dielectric withstand		P
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 Vac, 5 s	
	- no breakdown or flashover	See appended TABLE 13	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.	760 Vac L1: 0,017 mA L2: - L3: - N: 0,012 mA	P
8.3.6.7	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:	t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: ..... N :	2 min 43 s - - 2 min 42 s	P

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

8.3.7	**TEST SEQUENCE V: Performance of integrally fused circuit-breakers**	N/A

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

8.3.8	**TEST SEQUENCE VI: Combined test sequence** CDW3-1000N, 1000 A, 4P, equipped with trip unit of Genius 4.0A, sample no. 17#, 3 phases test		
	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	CDW3-1000N	
	Sample no:	17#	
	Rated current: I_n (A)	1000 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated short-time withstand current: (kA/s)	30 kA / 1 s	
	Rated frequency: (Hz)	50 / 60 Hz	
8.3.8.2	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:	243 s ≤ t ≤ 297 s tr: 30 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: .....N :	4 min 16 s 4 min 20 s 4 min 21 s -	P
8.3.8.3	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 Hz	P
	- duration of the test: (s)	1,03 s	P
	- power factor / time constant (ms):	0,25	P
	- factor ”n”	2,1	P
	- test voltage: (V) ..... L1-L2: ..... L2-L3: L1-L3:	436 Vac 436 Vac 436 Vac	P
	- r.m.s. test current: (kA) ..... L1: ..... L2: L3:	 30,8 kA 31,0 kA 30,9 kA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- highest peak current: (kA)	63,8 kA	P
8.3.8.4	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	CDW3-1000N	
	Sample no:	17#	
	Rated current: I_n (A)	1000 A	
	Rated operational voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	30 kA	
	Rated control supply voltage of closing releases: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of shunt release: Uc (V)	220 / 230 Vac	
	Rated control supply voltage of undervoltage releases: Uc (V)	220 / 230 Vac	
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.	Ir: 1,0 x In, tr: 30 s, Ii: 15 x In, Isd: 10 x Ir, tsd: 0,4 s	P
	closing releases energized with 85% at the rated Uc: (V)	187 Vac	P
	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)	Left / Right: 0 mm, Up / Down: 0 mm, Front / Back: 0 mm	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		P
	- size of hole: <30mm^2		P
	- finish: bare or conductive plating		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)	Load-star	P
	Conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	If terminals unmarked: line connected at: (underside/upside)	Upside	P
	Tightening torques: (Nm)	50 Nm	P
	Test sequence of operation: O – t – CO – t – CO		P
	The highest voltage applicable to the rated short-time current.		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	436 Vac 436 Vac 436 Vac	P
	- r.m.s. test current AC/DC: (A) ..... L1: ..... L2: L3:	 30,8 kA 31,0 kA 30,9 kA	P
	power factor/time constant :	0,25	P
	- Factor ”n”	2,1	P
	- peak test current (A) :	63,8 kA	P
	Test sequence ”O”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	62,4 kA 50,8 kA 51,9 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	381 MA^2s 367 MA^2s 361 MA^2s	P
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	58,0 kA 42,1 kA 59,7 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	20,8 MA^2s 10,3 MA^2s 20,1 MA^2s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Pause, t: (min)	3 min	P
	Test sequence ”CO”		
	- max. let-through current: (kApeak) ..... L1: ..... L2: L3:	60,8 kA 38,7 kA 56,1 kA	P
	- Joule integral I²dt (A²s) ..... L1: ..... L2: L3:	22,6 MA^2s 10,5 MA^2s 16,5 MA^2s	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.	414 ms	P
	During this test the instantaneous override shall not operate		P
	- and the making current release shall operate	16 kA	P
8.3.8.5	Operational performance capability with current.		
	Rated current: I_n (A)	1000 A	P
	Maximum rated operational voltage: Ue (V)	415 Vac	P
	Conductor cross-sectional area (mm²) :	Copper busbar (60 x 5) mm² x 2	P
	Number of operating cycles per hour	20 cycles per hour	P
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing releases energized at the rated Uc)	25 cycles	P
	Applied voltage: closing releases (V)	220 Vac	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.	Ir: 1,0 x In, tr: 30 s, Ii: 2 x In, Isd: 1,5 x Ir, tsd: 0,1 s	P
	Conditions, make/break operations:		P
	- test voltage U/Ue = 1,0 (V)..... L1-L2: ..... L2-L3: L1-L3:	416 Vac 416 Vac 415 Vac	P
	- test current I/Ie = 1,0 (A)..... L1: ..... L2: L3:	1,01 kA 1,01 kA 1,02 kA	P
	- power factor/time constant:	0,81	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	Min: 103 ms	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- off-time (s):	Max: 179,9 s	P
8.3.8.6	Verification of dielectric withstand		
	- equal to twice the rated operational voltage with a minimum of 1000 V	1000 Vac, 5 s	P
	- no breakdown or flashover	See appended TABLE 15	P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1,1 Ue)	460 Vac L1: 0.007 mA L2: 0.009 mA L3: 0.008 mA	P
8.3.8.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed the those specified in tab. 7.	See appended TABLE 7	P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	Max: 75 K	P
	conductor cross-sectional area (mm²) :	Copper busbar (100 x 5) mm^2 x 2	P
	test current Ie (A) :	1001 A	P
8.3.8.8	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	1,46 kA (1,45 x 1 x 1000 A) tr = 30 s	P
	Conventional tripping time: <1h when I_n < 63A, <2h when I_n > 63 A	8 min 11 s	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 max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		
	Time specified by the manufacturer:	t ≤ 297 s	P
	- Operation time: (s) ..... L1: ..... L2: ..... L3: .....N :	2 min 43 s 2 min 41 s 2 min 41 s -	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.9	**Critical d.c. load current test**		N/A
Annex B	**Circuit-breakers incorporating residual current protection**		N/A
Annex C	**Individual pole short-circuit test sequence**		N/A
Annex D	**Additional requirements for circuit-breakers intended for connection of aluminium conductors**		N/A

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

Annex F	**Additional tests for circuit-breakers with electronic over-current protection**		
F4 and F5	Verification of electromagnetic compatibility (EMC) CDW3-1000N, 200 A, 4P, sample no. 22#, trip unit type: iTR326		
	The current setting shall be set at minimum……:	Ir: 0,4 x In	P
	Short-time and instantaneous release settings shall each, if applicable, be adjusted to minimum value but to not less than 2,5 times I_r……..:	Isd: 3 x Ir, Ii: 2 x In	P
	Current was applied on two-phases chosen at random according to Figure F.2		P
F4	Immunity test		P
F.4.1	Harmonic currents		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	22#	
	Rated current: I_n (A)	200 A	
	The tests shall be performed at the rated frequency(Hz)	50 Hz	P
F.4.1.2	Test of option b)		P
	Amplitude of third harmonic > 60%.....:	76,3%	P
	Amplitude of fifth harmonic > 14%.....:	39,1%	P
	Amplitude of seventh harmonic > 7%.....:	7,82%	P
	Amplitude of twenty first harmonic >1%.....:	1,42%	P
	Peak factor Ip/Irms ≥ 2,1……..….:	2,44	P
	Current conduction time, for each half-wave is ≤21% of the period…….:	20,6%	P
F.4.1.3	First, test current at 0,9 I_r……..……..:	72 A	P
	Test duration, 10 times of the tripping time at 2 I_r.:	90 s	P
	No tripping was observed		P
	Then, test current at 2Ir…….……:	162 A	P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer…..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time…….……..……:	8,8 s	P

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

F.4.2	Electrostatic discharges		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	22#	
	Rated current: I_n (A)	200 A	
	Discharge test voltage……..:	6 kV / contact discharge 8 kV / air discharge	P
	Polarity of discharges……..:	positive / negative	P
	10 positive and 10 negative discharge with interval time of 1s		P
	During the test, the current 0,9 I_r……..……..:	72 A	P
	After the test, test current at 2,0 I_r……..…:	160 A	P
	The operating time shall be within the value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer…….:	8,1 s ≤ t ≤ 9,9 s	P
	Trip time……...……:	8,47 s	P
F.4.3	Radiated radio-frequency electromagnetic fields		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	22#	
	Rated current: I_n (A)	200 A	
	Test level……...……....:	10 V/m, 3 V/m	P
	Frequency range…….…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	During test, the current 0,9 I_r……..…..……..:	72 A	P
	Sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.		P
	No tripping was observed		P
	Then, test current at 2 I_r…….……:	160 A	P
	the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450MHz, the operation being verified after the field at each frequency has stabilized.		P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	Horizontal: 8,49 s; 8,43 s; 8,45 s; 8,44 s; 8,47 s; 8,43 s; 8,42 s; 8,44 s; 8,41 s; 8,45 s; 8,44 s; 8,46 s; 8,42 s. Vertical: 8,48 s; 8,45 s; 8,44 s; 8,47 s; 8,42 s; 8,44 s; 8,41 s; 8,46 s; 8,43 s; 8,46 s; 8,42 s; 8,44 s; 8,43 s	P
F.4.4	Electrical fast transients/bursts (EFT/B)		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	22#	
	Rated current: I_n (A)	200 A	
	Test level……...…….....:	4 kV	P
	Tr/Th:5/50ns		P
	Repetition frequency…….....:	5 kHz	P
	Test duration…….....:	1 min	P
	During test, the current 0,9 I_r……..…..……..:	72 A	P
	No tripping was observed		P
	Then, test current at 2 I_r…….……:	160 A	P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	Positive: 8,41 s Negative: 8,43 s	P
F.4.5	Surges		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	22#	
	Rated current: I_n (A)	200 A	
	Test level……...…….....:	4 kV (line to earth) 2 kV (line to line)	P
	Tr/Th:1,2/50 µs		P
	Pulses with both positive and negative polarity shall be applied, the phase angles being 0° and 90°.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A series of five pulses is applied for each polarity and each phase angel(total number of pulses:20), the interval between two pulses being approximately 1min.		P
	During the test, the current 0,9 Ir……..……...:	72 A	P
	After the test, test current at 2,0 Ir……..…:	160 A	P
	The operating time shall be within the value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer……:	8,1 s ≤ t ≤ 9,9 s	P
	Trip time……..……:	8,44 s (line to earth) 8,43 s (line to line)	P
F.4.6	Conducted disturbances induced by radio-frequency fields (common mode)		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	22#	
	Rated current: In (A)	200 A	
	Test level……...…….....:	10 V	P
	Frequency range…….…...:	0,15 - 80 MHz	P
	During test, the current 0,9 Ir……..……...:	72 A	P
	Sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.		P
	No tripping was observed		P
	Then, test current at 2Ir…….……:	160 A	P
	the test shall be performed at each of the following frequencies: 0,150; 0,300; 0,450; 0,600; 0,900; 1,20; 1,80; 2,40; 3,60; 4,80; 7,20; 9,60; 12,0; 19,2; 27,0; 49,4; 72,0 and 80,0MHz, the operation being verified after the level of the disturbing voltage at each frequency has stabilized.		P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	8,41 s; 8,45 s; 8,43 s; 8,44 s; 8,46 s; 8,43 s; 8,47 s; 8,42 s; 8,46 s; 8,45 s; 8,44 s; 8,42 s; 8,43 s; 8,45 s; 8,47 s; 8,42 s; 8,43 s; 8,44 s	P
F.4.7	Current dips		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	22#	
	Rated current: I_n (A)	200 A	
	Initial test current 0,9 I_r…..……..:	72 A	P
	I_D is dip the test current, T is period of the sinusoidal current		P
	Test duration, 3-4 times of the tripping time at 2 I_r or 10 min, whichever is lower……..:	30 s	P
	Test no. 1 with I_D = 0 and Δt = 0,5T		P
	No tripping was observed		P
	Test no. 2 with I_D = 0 and Δt = 1T		P
	No tripping was observed		P
	Test no. 3 with I_D = 0 and Δt = 5T		P
	No tripping was observed		P
	Test no. 4 with I_D = 0 and Δt = 25T		P
	No tripping was observed		P
	Test no. 5 with I_D = 0 and Δt = 50T		P
	No tripping was observed		P
	Test no. 6 with $I_D = 0,4 \times I_r$ and Δt = 10T		P
	No tripping was observed		P
	Test no. 7 with $I_D = 0,4 \times I_r$ and Δt = 25T		P
	No tripping was observed		P
	Test no. 8 with $I_D = 0,4 \times I_r$ and Δt = 50T		P
	No tripping was observed		P
	Test no. 9 with $I_D = 0,7 \times I_r$ and Δt = 10T		P
	No tripping was observed		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test no. 10 with $I_D = 0,7 \times I_r$ and $\Delta t = 25T$		P
	No tripping was observed		P
	Test no. 11 with $I_D = 0,7 \times I_r$ and $\Delta t = 50T$		P
	No tripping was observed		P
F.5	Emission tests		P
F.5.1	Harmonics		N/A
	The electronic control circuits operate at very low power and hence create negligible disturbances; therefore no tests are required.		N/A
F.5.2	Voltage fluctuations		N/A
	The electronic control circuits operate at very low power and hence create negligible disturbances; therefore no tests are required.		N/A
F.5.3	Conducted RF disturbances (150 kHz – 30 MHz)		N/A
	Circuit-breakers covered by this annex are independent of line voltage or of any auxiliary supply and have no direct coupling to the supply; the electronic circuits operate at very low power. These circuit-breakers create negligible disturbances and therefore no tests are required.		N/A
F.5.4	Radiated RF disturbances (30 MHz – 1 GHz)		P
	Type designation or serial number	CDW3-1000N	P
	Sample no:	22#	P
	Rated current: I_n (A)	200 A	P
	Limits of Class A of CISPR11 / CISPR22		P
	Limits of Class B of CISPR11 / CISPR22		N/A
	The product does not exceed the limits		P

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

Annex F	**Additional tests for circuit-breakers with electronic over-current protection**		
F4 and F5	Verification of electromagnetic compatibility (EMC) CDW3-1000N, 200 A, 4P, sample no. 23#, trip unit type: Genius 4.0H		
	The current setting shall be set at minimum……:	Ir: 0,4 x In; In: 200 A ;	P
	Short-time and instantaneous release settings shall each, if applicable, be adjusted to minimum value but to not less than 2,5 times I_r……..:	Isd: 3 x Ir; Ii: 2 x In;	P
	Current was applied on two-phases chosen at random according to Figure F.2		P
F4	Immunity test		P
F.4.1	Harmonic currents		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	23#	
	Rated current: I_n (A)	200 A	
	The tests shall be performed at the rated frequency(Hz)	50 Hz	P
F.4.1.2	Test of option b)		P
	Amplitude of third harmonic > 60%.....:	78,0%	P
	Amplitude of fifth harmonic > 14%.....:	37,9%	P
	Amplitude of seventh harmonic > 7%.....:	7,92%	P
	Amplitude of twenty first harmonic >1%.....:	1,40%	P
	Peak factor Ip/Irms ≥ 2,1……..….:	2,33	P
	Current conduction time, for each half-wave is ≤21% of the period…….:	20,6%	P
F.4.1.3	First, test current at 0,9 I_r……..……..:	72 A	P
	Test duration, 10 times of the tripping time at 2 I_r.:	90 s	P
	No tripping was observed		P
	Then, test current at 2Ir…….……:	161 A	P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer…..……..:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time…….……..……:	8,8 s	P

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

F.4.2	Electrostatic discharges		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	23#	
	Rated current: I_n (A)	200 A	
	Discharge test voltage……..:	6 kV / contact discharge 8 kV / air discharge	P
	Polarity of discharges……..:	positive / negative	P
	10 positive and 10 negative discharge with interval time of 1s		P
	During the test, the current 0,9 I_r……..……..:	72 A	P
	After the test, test current at 2,0 I_r……..…:	160 A	P
	The operating time shall be within the value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer…….:	8,1 s ≤ t ≤ 9,9 s	P
	Trip time……...……:	8,45 s	P
F.4.3	Radiated radio-frequency electromagnetic fields		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	23#	
	Rated current: I_n (A)	200 A	
	Test level……...……....:	10 V/m, 3 V/m	P
	Frequency range…….…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	During test, the current 0,9 I_r……..…..……..:	72 A	P
	Sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.		P
	No tripping was observed		P
	Then, test current at 2 I_r…….……:	160 A	P
	the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450MHz, the operation being verified after the field at each frequency has stabilized.		P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	Horizontal: 8,41 s; 8,44 s; 8,42 s; 8,45 s; 8,46 s; 8,47 s; 8,43 s; 8,44 s; 8,45 s; 8,42 s; 8,43 s; 8,41 s; 8,46 s. Vertical: 8,44 s; 8,43 s; 8,42 s; 8,44 s; 8,47 s; 8,46 s; 8,44 s; 8,43 s; 8,44 s; 8,43 s; 8,42 s; 8,43 s; 8,44 s	P
F.4.4	Electrical fast transients/bursts (EFT/B)		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	23#	
	Rated current: I_n (A)	200 A	
	Test level……...…….....:	4 kV	P
	Tr/Th:5/50ns		P
	Repetition frequency…….....:	5 kHz	P
	Test duration…….....:	1 min	P
	During test, the current 0,9 I_r……..…..……..:	72 A	P
	No tripping was observed		P
	Then, test current at 2 I_r…….……:	160 A	P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	Positive: 8,44 s Negative: 8,42 s	P
F.4.5	Surges		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	23#	
	Rated current: I_n (A)	200 A	
	Test level……...…….....:	4 kV (line to earth) 2 kV (line to line)	P
	Tr/Th:1,2/50 µs		P
	Pulses with both positive and negative polarity shall be applied, the phase angles being 0° and 90°.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A series of five pulses is applied for each polarity and each phase angel(total number of pulses:20), the interval between two pulses being approximately 1min.		P
	During the test, the current 0,9 Ir……..……...:	72 A	P
	After the test, test current at 2,0 Ir……..…:	160 A	P
	The operating time shall be within the value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer……:	8,1 s ≤ t ≤ 9,9 s	P
	Trip time……..……:	8,44 s (line to earth) 8,44 s (line to line)	P
F.4.6	Conducted disturbances induced by radio-frequency fields (common mode)		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	23#	
	Rated current: In (A)	200 A	
	Test level……...…….....:	10 V	P
	Frequency range…….…...:	0,15 - 80 MHz	P
	During test, the current 0,9 Ir……..……...:	72 A	P
	Sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.		P
	No tripping was observed		P
	Then, test current at 2Ir…….……:	160 A	P
	the test shall be performed at each of the following frequencies: 0,150; 0,300; 0,450; 0,600; 0,900; 1,20; 1,80; 2,40; 3,60; 4,80; 7,20; 9,60; 12,0; 19,2; 27,0; 49,4; 72,0 and 80,0MHz, the operation being verified after the level of the disturbing voltage at each frequency has stabilized.		P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	8,43 s; 8,46 s; 8,44 s; 8,45 s; 8,42 s; 8,41 s; 8,43 s; 8,44 s; 8,47 s; 8,45 s; 8,46 s; 8,43 s; 8,42 s; 8,43 s; 8,44 s; 8,45 s; 8,46 s; 8,42 s	P
F.4.7	Current dips		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	23#	
	Rated current: I_n (A)	200 A	
	Initial test current 0,9 I_r…..……..:	72 A	P
	I_D is dip the test current, T is period of the sinusoidal current		P
	Test duration, 3-4 times of the tripping time at 2 I_r or 10 min, whichever is lower……...:	30 s	P
	Test no. 1 with I_D = 0 and Δt = 0,5T		P
	No tripping was observed		P
	Test no. 2 with I_D = 0 and Δt = 1T		P
	No tripping was observed		P
	Test no. 3 with I_D = 0 and Δt = 5T		P
	No tripping was observed		P
	Test no. 4 with I_D = 0 and Δt = 25T		P
	No tripping was observed		P
	Test no. 5 with I_D = 0 and Δt = 50T		P
	No tripping was observed		P
	Test no. 6 with $I_D = 0,4 \times I_r$ and Δt = 10T		P
	No tripping was observed		P
	Test no. 7 with $I_D = 0,4 \times I_r$ and Δt = 25T		P
	No tripping was observed		P
	Test no. 8 with $I_D = 0,4 \times I_r$ and Δt = 50T		P
	No tripping was observed		P
	Test no. 9 with $I_D = 0,7 \times I_r$ and Δt = 10T		P
	No tripping was observed		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test no. 10 with $I_D = 0,7 \times I_r$ and $\Delta t = 25T$		P
	No tripping was observed		P
	Test no. 11 with $I_D = 0,7 \times I_r$ and $\Delta t = 50T$		P
	No tripping was observed		P
F.5	Emission tests		P
F.5.1	Harmonics		N/A
	The electronic control circuits operate at very low power and hence create negligible disturbances; therefore no tests are required.		N/A
F.5.2	Voltage fluctuations		N/A
	The electronic control circuits operate at very low power and hence create negligible disturbances; therefore no tests are required.		N/A
F.5.3	Conducted RF disturbances (150 kHz – 30 MHz)		N/A
	Circuit-breakers covered by this annex are independent of line voltage or of any auxiliary supply and have no direct coupling to the supply; the electronic circuits operate at very low power. These circuit-breakers create negligible disturbances and therefore no tests are required.		N/A
F.5.4	Radiated RF disturbances (30 MHz – 1 GHz)		P
	Type designation or serial number	CDW3-1000N	P
	Sample no:	23#	P
	Rated current: I_n (A)	200 A	P
	Limits of Class A of CISPR11 / CISPR22		P
	Limits of Class B of CISPR11 / CISPR22		N/A
	The product does not exceed the limits		P

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

Annex F	**Additional tests for circuit-breakers with electronic over-current protection**		
F4 and F5	Verification of electromagnetic compatibility (EMC) CDW3-1000N, 200 A, 4P, sample no. 24#, trip unit type: Genius 4.0A		
	The current setting shall be set at minimum……:	Ir: 0,4 x In; In: 200 A ;	P
	Short-time and instantaneous release settings shall each, if applicable, be adjusted to minimum value but to not less than 2,5 times I_r……..:	Isd: 2,5 x Ir; Ii: 2 x In;	P
	Current was applied on two-phases chosen at random according to Figure F.2		P
F4	Immunity test		P
F.4.1	Harmonic currents		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	24#	
	Rated current: I_n (A)	200 A	
	The tests shall be performed at the rated frequency(Hz)	50 Hz	P
F.4.1.2	Test of option b)		P
	Amplitude of third harmonic > 60%.....:	77,5%	P
	Amplitude of fifth harmonic > 14%.....:	37,9%	P
	Amplitude of seventh harmonic > 7%.....:	7,81%	P
	Amplitude of twenty first harmonic >1%.....:	1,41%	P
	Peak factor Ip/Irms ≥ 2,1……..….:	2,36	P
	Current conduction time, for each half-wave is ≤21% of the period…….:	20,9%	P
F.4.1.3	First, test current at 0,9 I_r……..……..:	72 A	P
	Test duration, 10 times of the tripping time at 2 I_r.:	90 s	P
	No tripping was observed		P
	Then, test current at 2Ir…….……:	160 A	P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer…..……..:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time…….……..……..:	8,5 s	P

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

F.4.2	Electrostatic discharges		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	24#	
	Rated current: I_n (A)	200 A	
	Discharge test voltage……..:	6 kV / contact discharge 8 kV / air discharge	P
	Polarity of discharges……..:	positive / negative	P
	10 positive and 10 negative discharge with interval time of 1s		P
	During the test, the current 0,9 I_r……..……..:	72 A	P
	After the test, test current at 2,0 I_r……..…:	160 A	P
	The operating time shall be within the value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer…….:	8,1 s ≤ t ≤ 9,9 s	P
	Trip time……...……:	8,42 s	P
F.4.3	Radiated radio-frequency electromagnetic fields		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	24#	
	Rated current: I_n (A)	200 A	
	Test level……...……....:	10 V/m, 3 V/m	P
	Frequency range…….…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	During test, the current 0,9 I_r……..…..……..:	72 A	P
	Sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.		P
	No tripping was observed		P
	Then, test current at 2 I_r…….……:	160 A	P
	the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450MHz, the operation being verified after the field at each frequency has stabilized.		P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	Horizontal: 8,45 s; 8,42 s; 8,43 s; 8,41 s; 8,44 s; 8,45 s; 8,42 s; 8,46 s; 8,44 s; 8,42 s; 8,43 s; 8,45 s; 8,41 s Vertical: 8,46 s; 8,44 s; 8,42 s; 8,40 s; 8,45 s; 8,46 s; 8,43 s; 8,44 s; 8,41 s; 8,43 s; 8,44 s; 8,45 s; 8,43 s	P
F.4.4	Electrical fast transients/bursts (EFT/B)		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	24#	
	Rated current: I_n (A)	200 A	
	Test level……...…….....:	4 kV	P
	Tr/Th:5/50ns		P
	Repetition frequency…….....:	5 kHz	P
	Test duration…….....:	1 min	P
	During test, the current 0,9 I_r……..…..……..:	72 A	P
	No tripping was observed		P
	Then, test current at 2 I_r…….……:	160 A	P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	Positive: 8,45 s Negative: 8,43 s	P
F.4.5	Surges		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	24#	
	Rated current: I_n (A)	200 A	
	Test level……...…….....:	4 kV (line to earth) 2 kV (line to line)	P
	Tr/Th:1,2/50 µs		P
	Pulses with both positive and negative polarity shall be applied, the phase angles being 0° and 90°.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A series of five pulses is applied for each polarity and each phase angel(total number of pulses:20), the interval between two pulses being approximately 1min.		P
	During the test, the current 0,9 Ir……..……..:	72 A	P
	After the test, test current at 2,0 Ir……..…:	160 A	P
	The operating time shall be within the value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer……:	8,1 s ≤ t ≤ 9,9 s	P
	Trip time……..……:	8,42 s (line to earth) 8,41 s (line to line)	P
F.4.6	Conducted disturbances induced by radio-frequency fields (common mode)		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	24#	
	Rated current: In (A)	200 A	
	Test level……...…….....:	10 V	P
	Frequency range…….…...:	0,15 - 80 MHz	P
	During test, the current 0,9 Ir……..……..:	72 A	P
	Sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.		P
	No tripping was observed		P
	Then, test current at 2Ir…….……:	160 A	P
	the test shall be performed at each of the following frequencies: 0,150; 0,300; 0,450; 0,600; 0,900; 1,20; 1,80; 2,40; 3,60; 4,80; 7,20; 9,60; 12,0; 19,2; 27,0; 49,4; 72,0 and 80,0MHz, the operation being verified after the level of the disturbing voltage at each frequency has stabilized.		P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	8,41 s; 8,44 s; 8,43 s; 8,47 s; 8,46 s; 8,45 s; 8,44 s; 8,43 s; 8,42 s; 8,46 s; 8,45 s; 8,43 s; 8,42 s; 8,41 s; 8,42 s; 8,43 s; 8,45 s; 8,42 s	P
F.4.7	Current dips		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	24#	
	Rated current: I_n (A)	200 A	
	Initial test current 0,9 I_r…..……..:	72 A	P
	I_D is dip the test current, T is period of the sinusoidal current		P
	Test duration, 3-4 times of the tripping time at 2 I_r or 10 min, whichever is lower……..:	30 s	P
	Test no. 1 with I_D = 0 and Δt = 0,5T		P
	No tripping was observed		P
	Test no. 2 with I_D = 0 and Δt = 1T		P
	No tripping was observed		P
	Test no. 3 with I_D = 0 and Δt = 5T		P
	No tripping was observed		P
	Test no. 4 with I_D = 0 and Δt = 25T		P
	No tripping was observed		P
	Test no. 5 with I_D = 0 and Δt = 50T		P
	No tripping was observed		P
	Test no. 6 with $I_D = 0,4 \times I_r$ and Δt = 10T		P
	No tripping was observed		P
	Test no. 7 with $I_D = 0,4 \times I_r$ and Δt = 25T		P
	No tripping was observed		P
	Test no. 8 with $I_D = 0,4 \times I_r$ and Δt = 50T		P
	No tripping was observed		P
	Test no. 9 with $I_D = 0,7 \times I_r$ and Δt = 10T		P
	No tripping was observed		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test no. 10 with $I_D = 0,7 \times I_r$ and $\Delta t = 25T$		P
	No tripping was observed		P
	Test no. 11 with $I_D = 0,7 \times I_r$ and $\Delta t = 50T$		P
	No tripping was observed		P
F.5	Emission tests		P
F.5.1	Harmonics		N/A
	The electronic control circuits operate at very low power and hence create negligible disturbances; therefore no tests are required.		N/A
F.5.2	Voltage fluctuations		N/A
	The electronic control circuits operate at very low power and hence create negligible disturbances; therefore no tests are required.		N/A
F.5.3	Conducted RF disturbances (150 kHz – 30 MHz)		N/A
	Circuit-breakers covered by this annex are independent of line voltage or of any auxiliary supply and have no direct coupling to the supply; the electronic circuits operate at very low power. These circuit-breakers create negligible disturbances and therefore no tests are required.		N/A
F.5.4	Radiated RF disturbances (30 MHz – 1 GHz)		P
	Type designation or serial number	CDW3-1000N	P
	Sample no:	24#	P
	Rated current: I_n (A)	200 A	P
	Limits of Class A of CISPR11 / CISPR22		P
	Limits of Class B of CISPR11 / CISPR22		N/A
	The product does not exceed the limits		P

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

Annex F	**Additional tests for circuit-breakers with electronic over-current protection**		
F4 and F5	Verification of electromagnetic compatibility (EMC) CDW3-1000N, 200 A, 4P, sample no. 25#, trip unit type: Genius 4.0		
	The current setting shall be set at minimum……:	Ir: 0,4 x In; In: 200 A ;	P
	Short-time and instantaneous release settings shall each, if applicable, be adjusted to minimum value but to not less than 2,5 times I_r……..:	Isd: 3 x Ir; Ii: 2 x In;	P
	Current was applied on two-phases chosen at random according to Figure F.2		P
F4	Immunity test		P
F.4.1	Harmonic currents		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	25#	
	Rated current: I_n (A)	200 A	
	The tests shall be performed at the rated frequency(Hz)	50 Hz	P
F.4.1.2	Test of option b)		P
	Amplitude of third harmonic > 60%.....:	77,5%	P
	Amplitude of fifth harmonic > 14%.....:	38,9%	P
	Amplitude of seventh harmonic > 7%.....:	7,96%	P
	Amplitude of twenty first harmonic >1%.....:	1,49%	P
	Peak factor Ip/Irms ≥ 2,1……..….:	2,39	P
	Current conduction time, for each half-wave is ≤21% of the period…….:	20,5%	P
F.4.1.3	First, test current at 0,9 I_r……..……..:	72 A	P
	Test duration, 10 times of the tripping time at 2 I_r.:	90 s	P
	No tripping was observed		P
	Then, test current at 2Ir…….……:	160 A	P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer…..……..:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time…….……..……..:	8,9 s	P

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

F.4.2	Electrostatic discharges		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	25#	
	Rated current: I_n (A)	200 A	
	Discharge test voltage……..:	6 kV / contact discharge 8 kV / air discharge	P
	Polarity of discharges……..:	positive / negative	P
	10 positive and 10 negative discharge with interval time of 1s		P
	During the test, the current 0,9 I_r……..……..:	72 A	P
	After the test, test current at 2,0 I_r……..…:	160 A	P
	The operating time shall be within the value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer…….:	8,1 s ≤ t ≤ 9,9 s	P
	Trip time……...……:	8,41 s	P
F.4.3	Radiated radio-frequency electromagnetic fields		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	25#	
	Rated current: I_n (A)	200 A	
	Test level……...……....:	10 V/m, 3 V/m	P
	Frequency range…….…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	During test, the current 0,9 I_r……..…..……..:	72 A	P
	Sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.		P
	No tripping was observed		P
	Then, test current at 2 I_r…….……:	160 A	P
	the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450MHz, the operation being verified after the field at each frequency has stabilized.		P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	Horizontal: 8,42 s; 8,43 s; 8,41 s; 8,42 s; 8,44 s; 8,45 s; 8,47 s; 8,43 s; 8,41 s; 8,42 s; 8,45 s; 8,44 s; 8,42 s. Vertical: 8,43 s; 8,41 s; 8,42 s; 8,41 s; 8,45 s; 8,44 s; 8,45 s; 8,44 s; 8,42 s; 8,43 s; 8,44 s; 8,45 s; 8,43 s	P
F.4.4	Electrical fast transients/bursts (EFT/B)		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	25#	
	Rated current: I_n (A)	200 A	
	Test level……...…….....:	4 kV	P
	Tr/Th:5/50ns		P
	Repetition frequency…….....:	5 kHz	P
	Test duration…….....:	1 min	P
	During test, the current 0,9 I_r……..…...……..:	72 A	P
	No tripping was observed		P
	Then, test current at 2 I_r…….……:	160 A	P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	Positive: 8,44 s Negative: 8,46 s	P
F.4.5	Surges		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	25#	
	Rated current: I_n (A)	200 A	
	Test level……...…….....:	4 kV (line to earth) 2 kV (line to line)	P
	Tr/Th:1,2/50 µs		P
	Pulses with both positive and negative polarity shall be applied, the phase angles being 0° and 90°.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A series of five pulses is applied for each polarity and each phase angel(total number of pulses:20), the interval between two pulses being approximately 1min.		P
	During the test, the current 0,9 Ir……..……...:	72 A	P
	After the test, test current at 2,0 Ir……..…:	160 A	P
	The operating time shall be within the value stated by the manufacturer for twice the current setting		
	Time specified by the manufacturer……:	8,1 s ≤ t ≤ 9,9 s	P
	Trip time……..……:	8,42 s (line to earth) 8,43 s (line to line)	P
F.4.6	Conducted disturbances induced by radio-frequency fields (common mode)		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	25#	
	Rated current: In (A)	200 A	
	Test level……...…….....:	10 V	P
	Frequency range…….…...:	0,15 - 80 MHz	P
	During test, the current 0,9 Ir……..……...:	72 A	P
	Sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1% of the precious frequency.		P
	No tripping was observed		P
	Then, test current at 2Ir…….……:	160 A	P
	the test shall be performed at each of the following frequencies: 0,150; 0,300; 0,450; 0,600; 0,900; 1,20; 1,80; 2,40; 3,60; 4,80; 7,20; 9,60; 12,0; 19,2; 27,0; 49,4; 72,0 and 80,0MHz, the operation being verified after the level of the disturbing voltage at each frequency has stabilized.		P
	The operating time shall be within 0,9 times the minimum value and 1,1 times the maximum value stated by the manufacturer for twice the current setting		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time specified by the manufacturer……..…….:	7,29 s ≤ t ≤ 10,89 s	P
	Trip time……..……:	8,44 s; 8,47 s; 8,45 s; 8,42 s; 8,44 s; 8,43 s; 8,43 s; 8,42 s; 8,41 s; 8,44 s; 8,45 s; 8,44 s; 8,42 s; 8,41 s; 8,43 s; 8,45 s; 8,46 s; 8,47 s	P
F.4.7	Current dips		P
	Type designation or serial number	CDW3-1000N	
	Sample no:	25#	
	Rated current: I_n (A)	200 A	
	Initial test current 0,9 I_r…..……..:	72 A	P
	I_D is dip the test current, T is period of the sinusoidal current		P
	Test duration, 3-4 times of the tripping time at 2 I_r or 10 min, whichever is lower……..:	30 s	P
	Test no. 1 with I_D = 0 and Δt = 0,5T		P
	No tripping was observed		P
	Test no. 2 with I_D = 0 and Δt = 1T		P
	No tripping was observed		P
	Test no. 3 with I_D = 0 and Δt = 5T		P
	No tripping was observed		P
	Test no. 4 with I_D = 0 and Δt = 25T		P
	No tripping was observed		P
	Test no. 5 with I_D = 0 and Δt = 50T		P
	No tripping was observed		P
	Test no. 6 with $I_D = 0,4 \times I_r$ and Δt = 10T		P
	No tripping was observed		P
	Test no. 7 with $I_D = 0,4 \times I_r$ and Δt = 25T		P
	No tripping was observed		P
	Test no. 8 with $I_D = 0,4 \times I_r$ and Δt = 50T		P
	No tripping was observed		P
	Test no. 9 with $I_D = 0,7 \times I_r$ and Δt = 10T		P
	No tripping was observed		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test no. 10 with $I_D = 0,7 \times I_r$ and $\Delta t = 25T$		P
	No tripping was observed		P
	Test no. 11 with $I_D = 0,7 \times I_r$ and $\Delta t = 50T$		P
	No tripping was observed		P
F.5	Emission tests		P
F.5.1	Harmonics		N/A
	The electronic control circuits operate at very low power and hence create negligible disturbances; therefore no tests are required.		N/A
F.5.2	Voltage fluctuations		N/A
	The electronic control circuits operate at very low power and hence create negligible disturbances; therefore no tests are required.		N/A
F.5.3	Conducted RF disturbances (150 kHz – 30 MHz)		N/A
	Circuit-breakers covered by this annex are independent of line voltage or of any auxiliary supply and have no direct coupling to the supply; the electronic circuits operate at very low power. These circuit-breakers create negligible disturbances and therefore no tests are required.		N/A
F.5.4	Radiated RF disturbances (30 MHz – 1 GHz)		P
	Type designation or serial number	CDW3-1000N	P
	Sample no:	25#	P
	Rated current: I_n (A)	200 A	P
	Limits of Class A of CISPR11 / CISPR22		P
	Limits of Class B of CISPR11 / CISPR22		N/A
	The product does not exceed the limits		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
F.7.	Dry heat test CDW3-1000N, 1000 A, 4P, sample no. 18# trip unit type: Genius 4.0		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	1000 A / 40 °C	
	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. I_n absence of such instructions, table 4 of IEC 60947-1 shall apply	50 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		
	- install the electronic controls in the chamber		
	- supply the electronic controls which there input energizing value		
	- 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		
	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).		P
7.2.1.2.4	Opening by over-current releases		P
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	421 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,05 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	523 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,5 s 1,31 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 15 s	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		P
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P
F.8.	Damp heat test CDW3-1000N, 1000 A, 4P, sample no. 18# trip unit type: Genius 4.0		P
F.8.1	Test procedure		P
	The test shall be performed according to IEC 60068-2-30 (12 +12 hours cycle)		
	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		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	the upper temperature		
	The test may be performed with only the electronic controls in the test chamber		N/A
	Test result……..:		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).		P
7.2.1.2.4	Opening by over-current releases		P
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	423 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,06 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	520 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,8 s 1,30 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 04 s	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		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P
F.9.	Temperature variation cycles at a specified rate of change CDW3-1000N, 1000 A, 4P, sample no.. 18# trip unit type: Genius 4.0		P
F.9.1	Test conditions		P
	Each design of electronic controls shall be 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).		P
7.2.1.2.4	Opening by over-current releases		P
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		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	current setting of the overload release		
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	421 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,05 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	523 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,2 s 1,32 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 07 s	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		P
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P

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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
F.7.	Dry heat test CDW3-1000N, 1000 A, 4P, sample no. 19# trip unit type: Genius 4.0A		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	1000 A / 40 °C	
	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. I_n absence of such instructions, table 4 of IEC 60947-1 shall apply	50 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		
	- install the electronic controls in the chamber		
	- supply the electronic controls which there input energizing value		
	- 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		
	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).		P
7.2.1.2.4	Opening by over-current releases		P
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	422 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,06 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	521 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,7 s 1,31 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 06 s	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		P
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P
F.8.	Damp heat test CDW3-1000N, 1000 A, 4P, sample no. 19# trip unit type: Genius 4.0A		P
F.8.1	Test procedure		P
	The test shall be performed according to IEC 60068-2-30 (12 +12 hours cycle)		
	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		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	the upper temperature		
	The test may be performed with only the electronic controls in the test chamber		N/A
	Test result……..:		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).		P
7.2.1.2.4	Opening by over-current releases		P
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	421 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,05 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	521 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,2 s 1,32 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 11 s	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		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P
F.9.	Temperature variation cycles at a specified rate of change CDW3-1000N, 1000 A, 4P, sample no. 19# trip unit type: Genius 4.0A		P
F.9.1	Test conditions		P
	Each design of electronic controls shall be 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).		P
7.2.1.2.4	Opening by over-current releases		P
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		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	current setting of the overload release		
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	423 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,05 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	521 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,0 s 1,31 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 18 s	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		P
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P

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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
F.7.	Dry heat test CDW3-1000N, 1000 A, 4P, sample no. 20# trip unit type: Genius 4.0H		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	1000 A / 40 ^{o}C	
	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. I_n absence of such instructions, table 4 of IEC 60947-1 shall apply	50 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		
	- install the electronic controls in the chamber		
	- supply the electronic controls which there input energizing value		
	- 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		
	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).		P
7.2.1.2.4	Opening by over-current releases		P
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	420 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,06 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	523 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,7 s 1,30 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 03 s	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		P
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P
F.8.	Damp heat test CDW3-1000N, 1000 A, 4P, sample no. 20# trip unit type: Genius 4.0H		P
F.8.1	Test procedure		P
	The test shall be performed according to IEC 60068-2-30 (12 +12 hours cycle)		
	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		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	the upper temperature		
	The test may be performed with only the electronic controls in the test chamber		N/A
	Test result……..:		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).		P
7.2.1.2.4	Opening by over-current releases		P
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	422 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,05 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	523 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,2 s 1,31 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 12 s	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		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P
F.9.	Temperature variation cycles at a specified rate of change CDW3-1000N, 1000 A, 4P, sample no. 20# trip unit type: Genius 4.0H		P
F.9.1	Test conditions		P
	Each design of electronic controls shall be 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).		P
7.2.1.2.4	Opening by over-current releases		P
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		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	current setting of the overload release		
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	421 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,06 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	523 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,0 s 1,32 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 10 s	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		P
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P

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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
F.7.	Dry heat test CDW3-1000N, 1000 A, 4P, sample no. 21# trip unit type: iTR326H		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	1000 A / 40 °C	
	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. I_n absence of such instructions, table 4 of IEC 60947-1 shall apply	50 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		
	- install the electronic controls in the chamber		
	- supply the electronic controls which there input energizing value		
	- 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		
	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).		P
7.2.1.2.4	Opening by over-current releases		P
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	422 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,06 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	522 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,5 s 1,31 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 13 s	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		P
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P
F.8.	Damp heat test CDW3-1000N, 1000 A, 4P, sample no. 21# trip unit type: iTR326H		P
F.8.1	Test procedure		P
	The test shall be performed according to IEC 60068-2-30 (12 +12 hours cycle)		
	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		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	the upper temperature		
	The test may be performed with only the electronic controls in the test chamber		N/A
	Test result……..:		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).		P
7.2.1.2.4	Opening by over-current releases		P
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	423 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,05 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	520 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,1 s 1,32 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 06 s	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		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P
F.9.	Temperature variation cycles at a specified rate of change CDW3-1000N, 1000 A, 4P, sample no. 21# trip unit type: iTR326H		P
F.9.1	Test conditions		P
	Each design of electronic controls shall be 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).		P
7.2.1.2.4	Opening by over-current releases		P
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		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	current setting of the overload release		
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	423 A (1,05 x 0,4 x 1000 A) tr: 1,0 s 2 h non-tripping 1,06 kA (1,05 x 1 x 1000 A) tr: 30 s 2 h non-tripping	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	521 A (1,3 x 0,4 x 1000 A) tr: 1,0 s Trip time: 21,7 s 1,31 kA (1,3 x 1 x 1000 A) tr: 30 s Trip time: 10 min 04 s	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		P
	The width of the temperature band shall be at least 10 K on either side of the reference temperature		P

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

Annex H	**Individual pole short-circuit test sequence**	N/A

Annex J	**Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers**		P
		Annex F and Annex N	P

Annex L	**Circuit-breakers not fulfilling the requirements for overcurrent protection**	N/A

Annex M	**Modular residual current devices (without integral current breaking device)**	N/A

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Shunt release	P
	Type designation or serial number	110 Vdc	P
	Rated voltage:	110 Vdc	P
	Sample no:	26#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Shunt release	P
	Type designation or serial number	220 Vdc	P
	Rated voltage:	220 Vdc	P
	Sample no:	27#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Shunt release	P
	Type designation or serial number	220 / 230 Vac	P
	Rated voltage:	220 / 230 Vac	P
	Sample no:	28#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Shunt release	P
	Type designation or serial number	380 / 400 Vac	P
	Rated voltage:	380 / 400 Vac	P
	Sample no:	29#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Undervoltage release	P
	Type designation or serial number	220 / 230 Vac	P
	Rated voltage:	220 / 230 Vac	P
	Sample no:	30#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Undervoltage release	P
	Type designation or serial number	380 / 400 Vac	P
	Rated voltage:	380 / 400 Vac	P
	Sample no:	31#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Power module for trip unit	P
	Type designation or serial number	110 Vdc	P
	Rated voltage:	110 Vdc	P
	Sample no:	32#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Power module for trip unit	P
	Type designation or serial number	220 Vdc	P
	Rated voltage:	220 Vdc	P
	Sample no:	33#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Power module for trip unit	P
	Type designation or serial number	220 / 230 Vac	P
	Rated voltage:	220 / 230 Vac	P
	Sample no:	34#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range……..…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		
	Name of accessory	Power module for trip unit	P
	Type designation or serial number	380 / 400 Vac	P
	Rated voltage:	380 / 400 Vac	P
	Sample no:	35#	P
N.2.3	Radiated radio-frequency electromagnetic field	10 V/m, 3 V/m	P
	Frequency range…….…...:	80 MHz - 1 GHz (10 V/m) 1,4 - 6,0 GHz (3 V/m)	P
	Step 1, sweeping the frequency range, the dwell time of the amplitude modulated carrier for each frequency shall be between 500ms and 1000ms, and the step size shall be 1 % of the precious frequency.		P
	Performance criterion A of N.2.1.2 applies.		P
	Step 2, the test shall be performed at each of the following frequencies: 80; 100; 120; 180; 240; 320; 480; 640; 960; 1400; 1920; 2150 and 2450 MHz, the operation being verified after the field at each frequency has stabilized.		P
	At each of the frequencies, the operation of the device shall be checked according to N.2.1.3, the test is not applicable to remote status indicators,		P

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

Annex O	**Instantaneous trip circuit-breakers (ICB)**	N/A

Annex P	**DC circuit-breakers for use in photovoltaic (PV) applications**	N/A

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

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

	TABLE 1: Heating Test (Seq. I, 8.3.3.7, sample number 1#)		P
	Test current (A):	1000 A	—
	Ambient (^{o}C):	16 ^{o}C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
Terminal of top left phase pole	62	80
Terminal of top centre phase pole	60	80
Terminal of top right phase pole	55	80
Terminal of bottom left phase pole	54	80
Terminal of bottom centre phase pole	54	80
Terminal of bottom right phase pole	51	80
Manual operating means: non-metallic (Button)	0	35
Manual operating means: non-metallic (Handle)	14	35
Parts intended to be touched but not hand-held: non-metallic	13	50
Parts which need not be touched during normal operation: metallic	8	50
Parts which need not be touched during normal operation: non-metallic	30	60
Undervoltage release (class A): 400 Vac / 50 Hz	38	70
Undervoltage release (class A): 400 Vac / 60 Hz	39	70
Supplementary information: N/A		

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

	TABLE 2: Heating Test (Seq. I, 8.3.3.7, sample number 2#)		P
	Test current (A):	1000 A	—
	Ambient (^{o}C):	16 ^{o}C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
Terminal of top left phase pole	62	80
Terminal of top centre phase pole	67	80
Terminal of top right phase pole	55	80
Terminal of bottom left phase pole	56	80
Terminal of bottom centre phase pole	60	80
Terminal of bottom right phase pole	52	80
Manual operating means: non-metallic (Button)	0	35
Manual operating means: non-metallic (Handle)	17	35
Parts intended to be touched but not hand-held: non-metallic	13	50
Parts which need not be touched during normal operation: metallic	8	50
Parts which need not be touched during normal operation: non-metallic	32	60
Undervoltage release (class A): 230 Vac / 50 Hz	27	70
Undervoltage release (class A): 230 Vac / 60 Hz	28	70
Supplementary information: N/A		

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

	TABLE 3: Heating Test (Seq. II+III, 8.3.4.5, sample number 7#)		P
	Test current (A):	1000 A	—
	Ambient (^{o}C):	17 ^{o}C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
Terminal of top left phase pole	66	80
Terminal of top centre phase pole	78	80
Terminal of top right phase pole	65	80
Terminal of bottom left phase pole	57	80
Terminal of bottom centre phase pole	67	80
Terminal of bottom right phase pole	58	80
Supplementary information: N/A		

	TABLE 4: Heating Test (Seq. IV, 8.3.6.4, sample number 38#)		P
	Test current (A):	1000 A	—
	Ambient (^{o}C):	19 ^{o}C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
Terminal of top left phase pole	55	80
Terminal of top centre phase pole	66	80
Terminal of top right phase pole	56	80
Terminal of bottom left phase pole	52	80
Terminal of bottom centre phase pole	61	80
Terminal of bottom right phase pole	51	80
Supplementary information: N/A		

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

	TABLE 5: Heating Test (Seq. IV, 8.3.6.4, sample number 15#)		P
	Test current (A):	1000 A	—
	Ambient (^{o}C):	16 ^{o}C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
External terminal - top N pole	48	80
External terminal - top adjacent pole	57	80
External terminal - bottom N pole	46	80
External terminal - bottom adjacent pole	52	80
Supplementary information: N/A		

	TABLE 6: Heating Test (Seq. IV, 8.3.6.4, sample number 16#)		P
	Test current (A):	1000 A	—
	Ambient (^{o}C):	16 ^{o}C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
External terminal - top N pole	48	80
External terminal - top adjacent pole	49	80
External terminal - bottom N pole	46	80
External terminal - bottom adjacent pole	47	80
Supplementary information: N/A		

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

	TABLE 7: Heating Test (Seq. VI, 8.3.8.7, sample number 17#)		P
	Test current (A):	1000 A	—
	Ambient (^{o}C):	15 ^{o}C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
Terminal of top left phase pole	63	80
Terminal of top centre phase pole	75	80
Terminal of top right phase pole	63	80
Terminal of bottom left phase pole	52	80
Terminal of bottom centre phase pole	66	80
Terminal of bottom right phase pole	56	80
Supplementary information: N/A		

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

	TABLE 8: dielectric strength (Seq. I, 8.3.3.6, sample number 1# - 2#)		P
test voltage applied between:		**test potential applied (V)**	**breakdown / flashover (Yes/No)**
between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		1380 Vac	No
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		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the main circuit		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the exposed conductive parts		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the enclosure or mounting plate		1380 Vac	No
across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		1380 Vac	No
supplementary information: N/A			

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

	TABLE 9: dielectric strength (Seq. II, 8.3.4.4, sample number 6#)		P
test voltage applied between:		**test potential applied (V)**	**breakdown / flashover (Yes/No)**
between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		1000 Vac	No
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		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the main circuit		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the exposed conductive parts		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the enclosure or mounting plate		1000 Vac	No
across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		1000 Vac	No
supplementary information: N/A			

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

	TABLE 10: dielectric strength (Seq. II+III, 8.3.4.4, sample number 7#)		P
test voltage applied between:		**test potential applied (V)**	**breakdown / flashover (Yes/No)**
between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		1380 Vac	No
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		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the main circuit		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the exposed conductive parts		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the enclosure or mounting plate		1380 Vac	No
across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		1380 Vac	No
supplementary information: N/A			

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

	TABLE 11: dielectric strength (Seq. III, 8.3.5.4, sample number 8# - 11#, 13#)		P
test voltage applied between:		**test potential applied (V)**	**breakdown / flashover (Yes/No)**
between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		1000 Vac	No
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		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the main circuit		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the exposed conductive parts		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the enclosure or mounting plate		1000 Vac	No
across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		1000 Vac	No
supplementary information: N/A			

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

	TABLE 12: dielectric strength (Seq. III, 8.3.5.4, sample number 12#)		P
test voltage applied between:		**test potential applied (V)**	**breakdown / flashover (Yes/No)**
between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		1380 Vac	No
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		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the main circuit		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the exposed conductive parts		1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the enclosure or mounting plate		1380 Vac	No
across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		1380 Vac	No
supplementary information: N/A			

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

	TABLE 13: dielectric strength (Seq. IV, 8.3.6.6, sample number 38# and 16#)	P

test voltage applied between:	**test potential applied (V)**	**breakdown / flashover (Yes/No)**
between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation	1380 Vac	No
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	1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the main circuit	1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the exposed conductive parts	1380 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the enclosure or mounting plate	1380 Vac	No
across the poles of the main circuit, the line terminals being connected together and the load terminals connected together	1380 Vac	No
supplementary information: N/A		

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

	TABLE 14: dielectric strength (Seq. IV, 8.3.6.6, sample number 15#)		P
test voltage applied between:		**test potential applied (V)**	**breakdown / flashover (Yes/No)**
between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		1000 Vac	No
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		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the main circuit		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the exposed conductive parts		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the enclosure or mounting plate		1000 Vac	No
across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		1000 Vac	No
supplementary information: N/A			

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

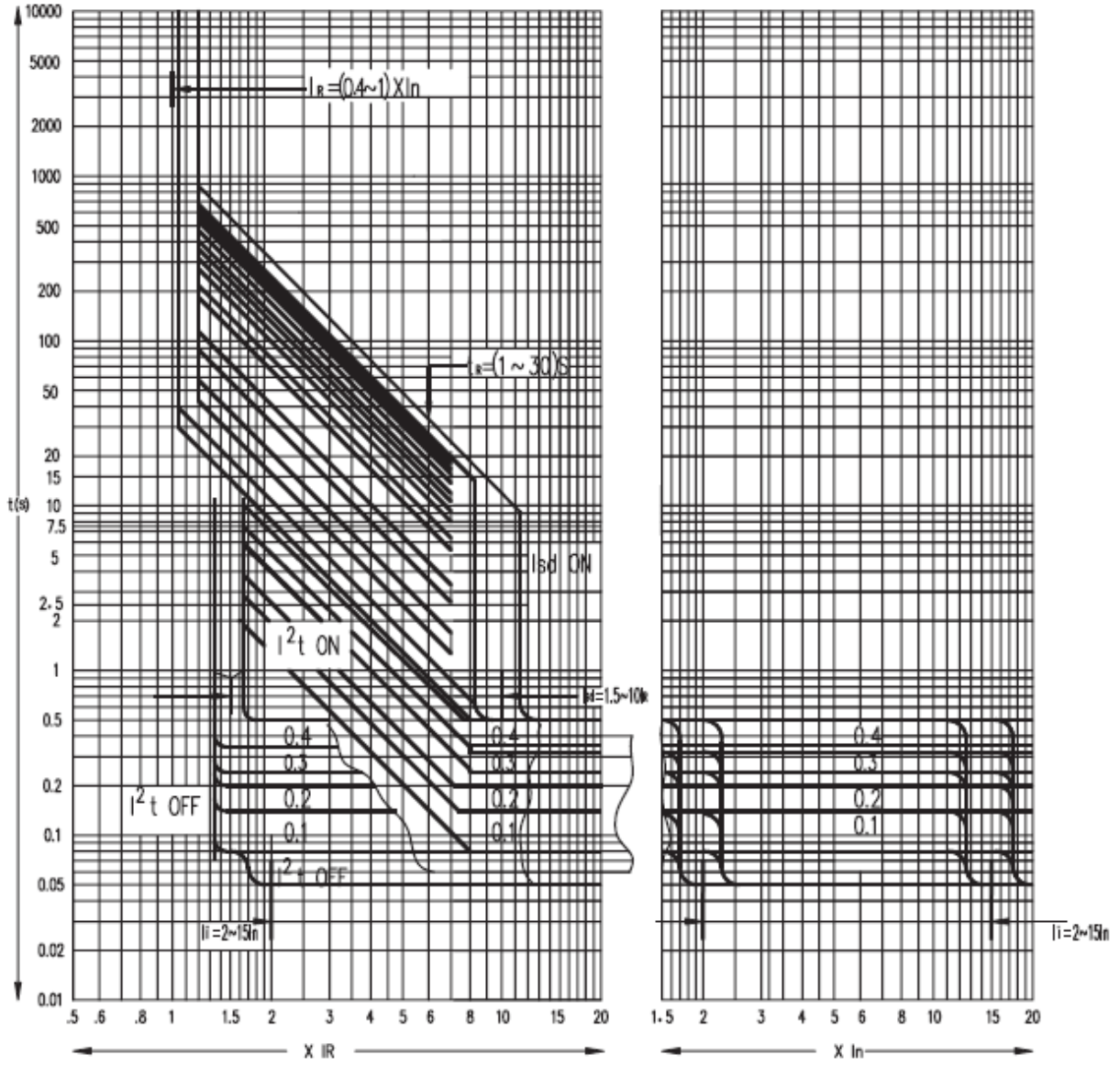
	TABLE 15: dielectric strength (Seq. VI, 8.3.8.6, sample number 17#)		P
test voltage applied between:		**test potential applied (V)**	**breakdown / flashover (Yes/No)**
between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		1000 Vac	No
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		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the main circuit		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the exposed conductive parts		1000 Vac	No
between each control and auxiliary circuit not normally connected to the main circuit and the enclosure or mounting plate		1000 Vac	No
across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		1000 Vac	No
supplementary information: N/A			

	TABLE 16: Clearance And Creepage Distance Measurements					P
clearance cl and creepage distance dcr at/of:	**Ui (V)**	**Uimp (V)**	**Required cl (mm)**	**cl (mm)**	**required dcr (mm)**	**dcr (mm)**
Between the contacts in the open position	1000 V	12 kV	14 mm	30,3 mm	16 mm	73,3 mm
Between poles	1000 V	12 kV	14 mm	34,6 mm	16 mm	49,9 mm
Between live parts and parts intended to be earthed	1000 V	12 kV	14 mm	25,4 mm	16 mm	52,1 mm
The live parts between control circuit and main circuit of the ACB	690 V	4 kV	3 mm	42,2 mm	10 mm	77,6 mm
Between poles of control circuit	690 V	4 kV	3 mm	20,5 mm	10 mm	23,6 mm
The live parts between control circuit and parts intended to be earthed	690 V	4 kV	3 mm	41,9 mm	10 mm	78,5 mm
Supplementary information: N/A						

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

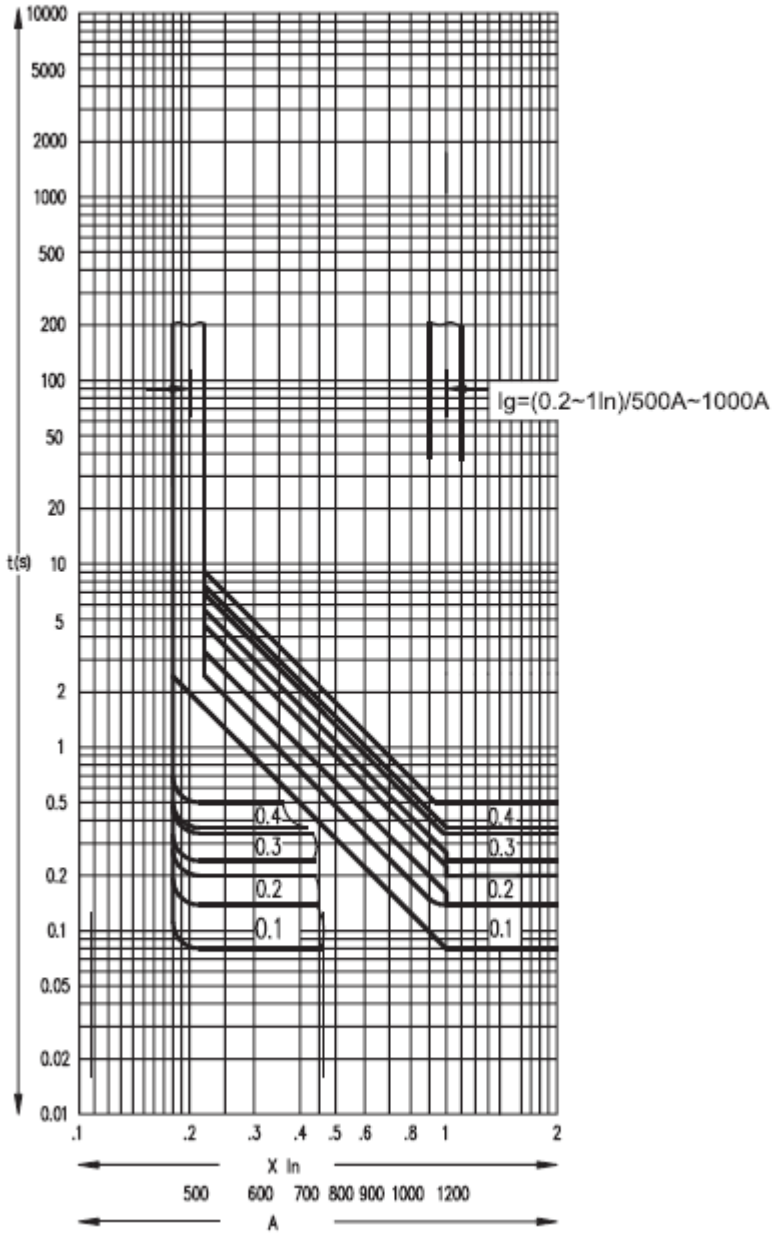
TABLE 17: Resistance to heat and fire - Glow wire tests							P
Object/ Part No./ Material	**Color**	**Manufacturer/ trademark**	**Glow wire test (GWT); (°C)**				**Verdict**
			650		**960**		
			te	**ti**	**te**	**ti**	
Cover / ABS	Cool gray	Ningbo Qile Electric Group Co., Ltd.	-	-			P
Base / BMC	Gray	Ningbo Qile Electric Group Co., Ltd.					P
Base for drawer / BMC	Black	Ningbo Qile Electric Group Co., Ltd.					P
Push button (OFF) / PA66	Green	Ningbo Qile Electric Group Co., Ltd.	-	-			P
Push button (ON) / PA66	Red	Ningbo Qile Electric Group Co., Ltd.	-	-			P
Handle / PA66	Red	Ningbo Qile Electric Group Co., Ltd.	-	-			P
Arcing chamber / Melamine glass cloth laminate	Black	Ningbo Qile Electric Group Co., Ltd.			-	-	P
Enclose for trip unit / PA66	Gray	SHANGHAI LEIYUE AUTOMATION EQUIPMENT CO., LTD.	-	-			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							

Time current characteristics



Instantaneous / Short-time / Long time tripping curve

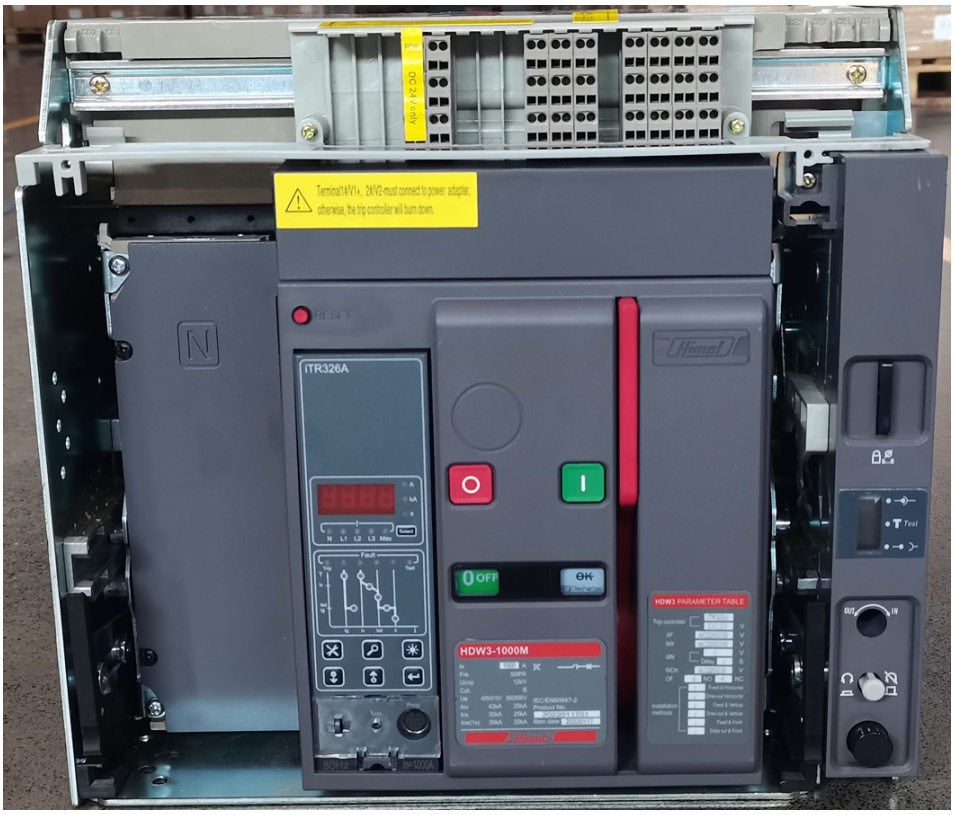
For short circuit condition, definite time-delay (I2t OFF condition only) was verified according to the standard



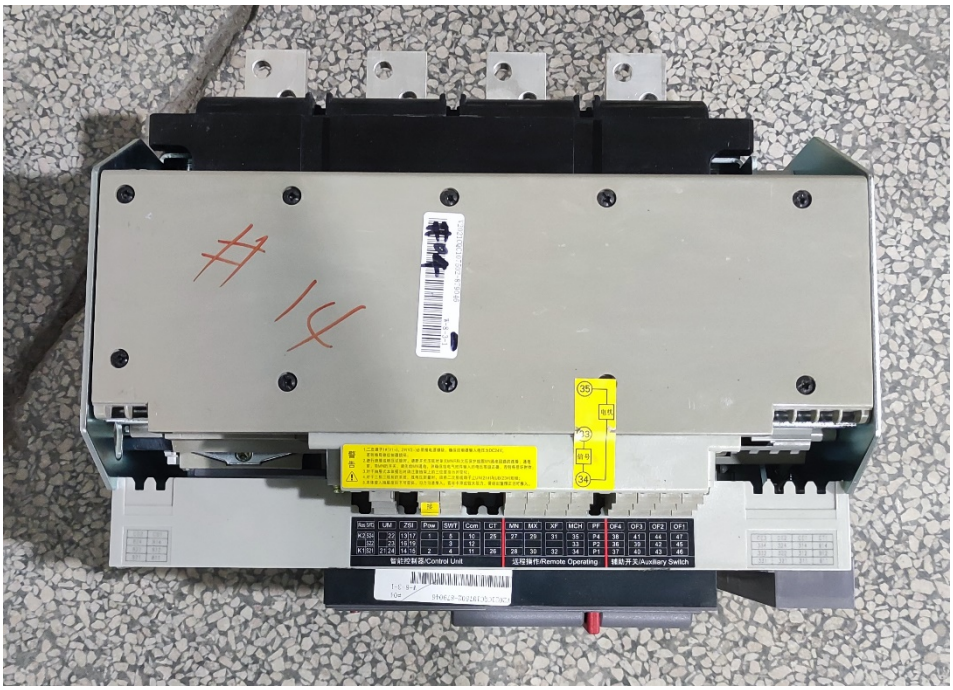
Ground fault tripping curve

For ground condition, definite time-delay (I2t OFF condition only) was verified according to the standard

Photographs

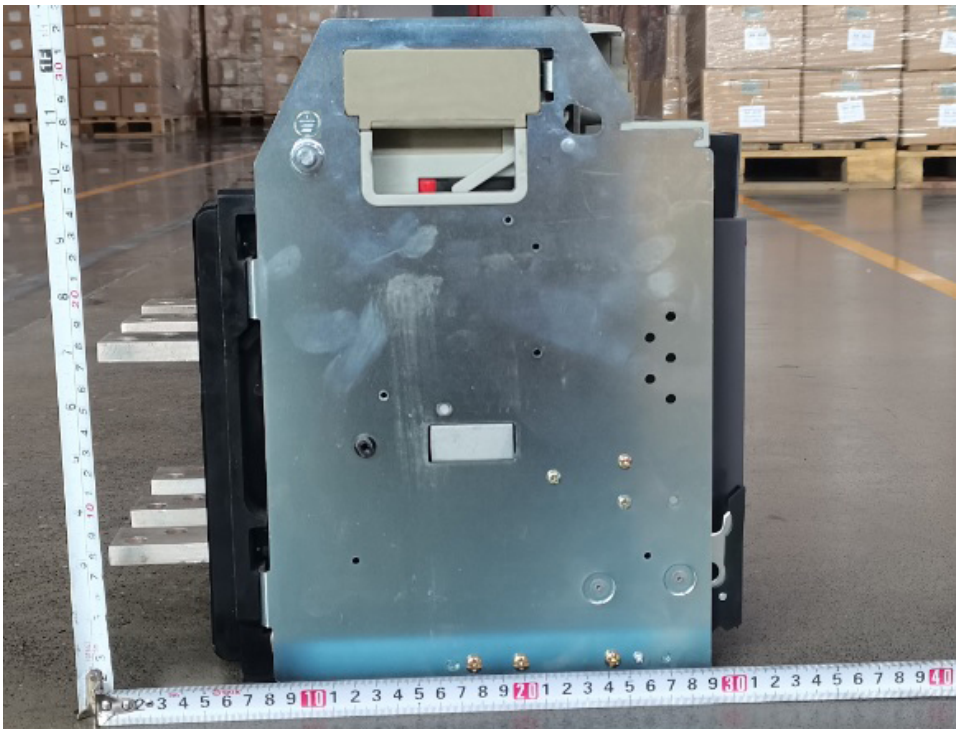


Front view



Top view

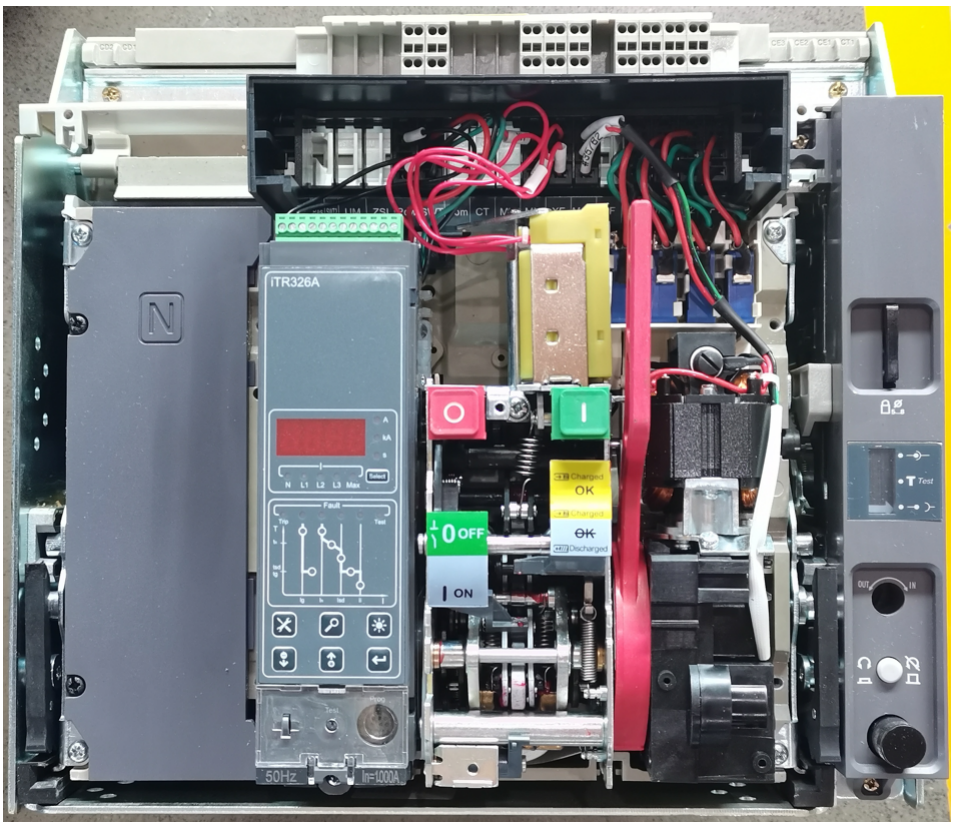
Side view



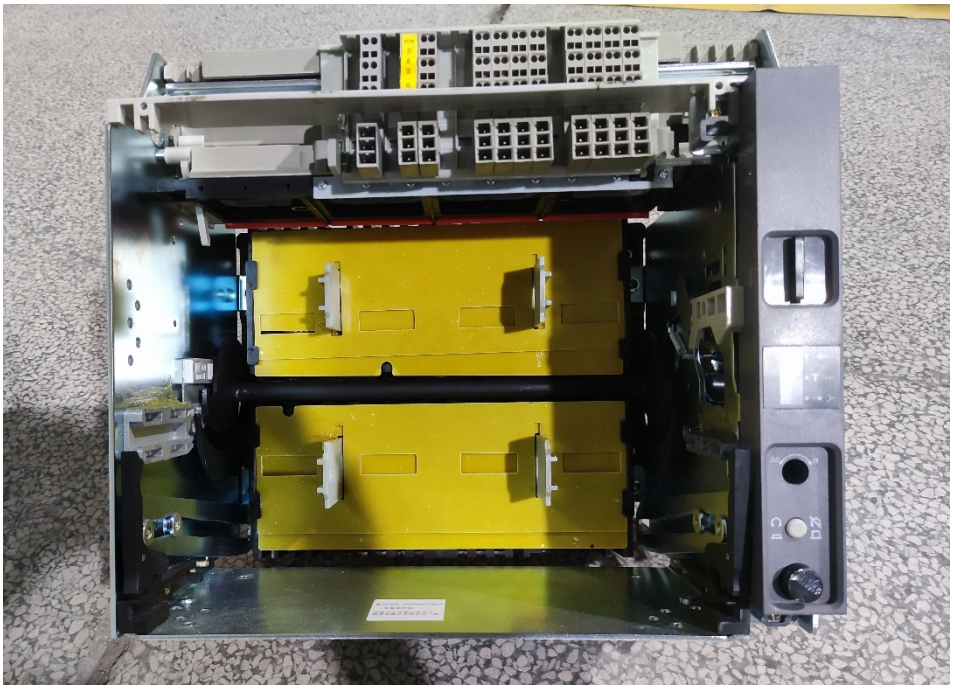
Side view

Back view for ACB

Back view without cradle

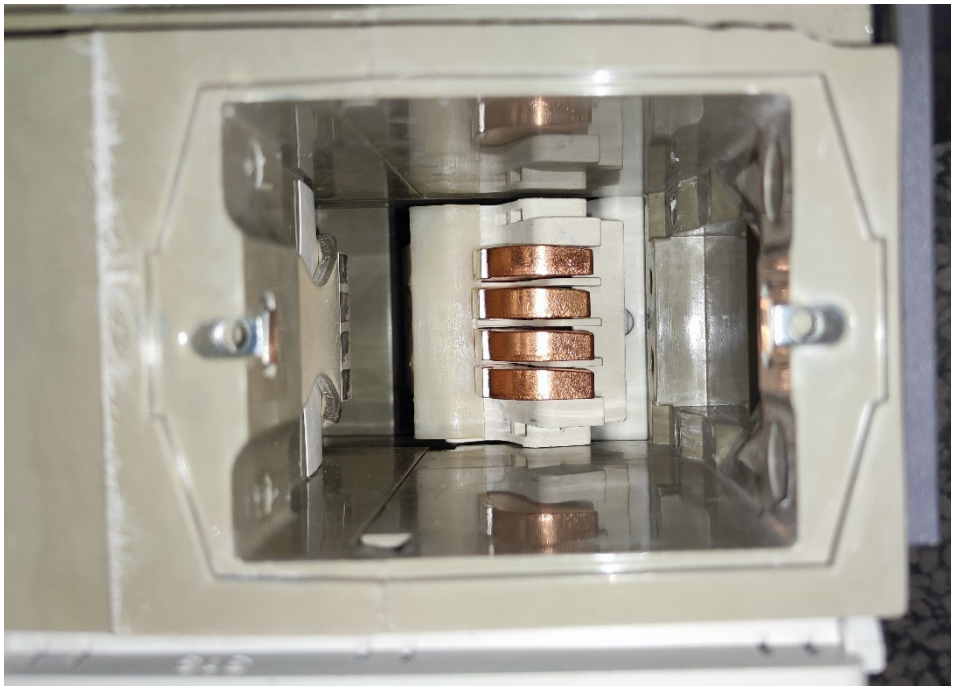


Open view

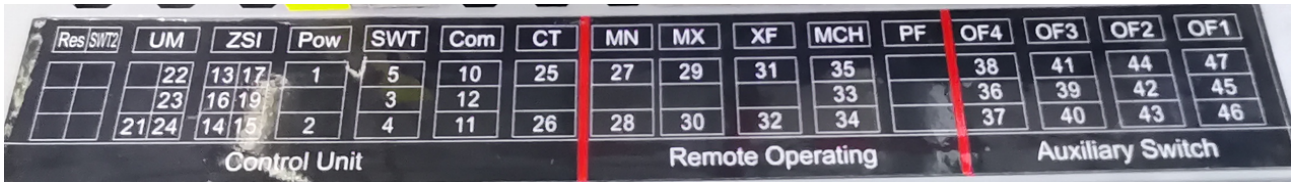


Cluster in cradle

Top view without cradle

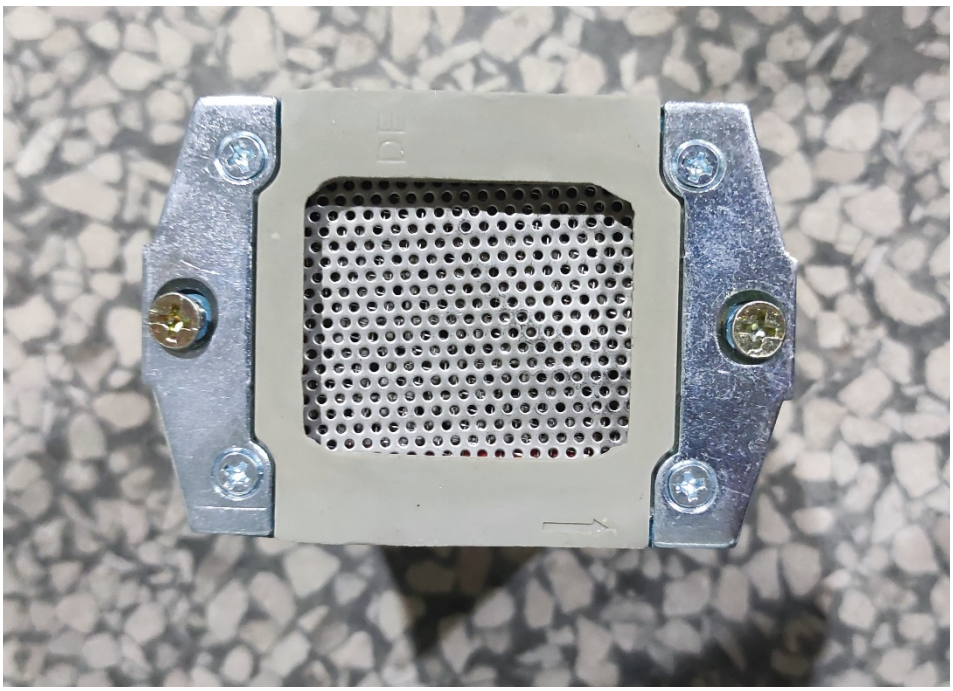


Contact view



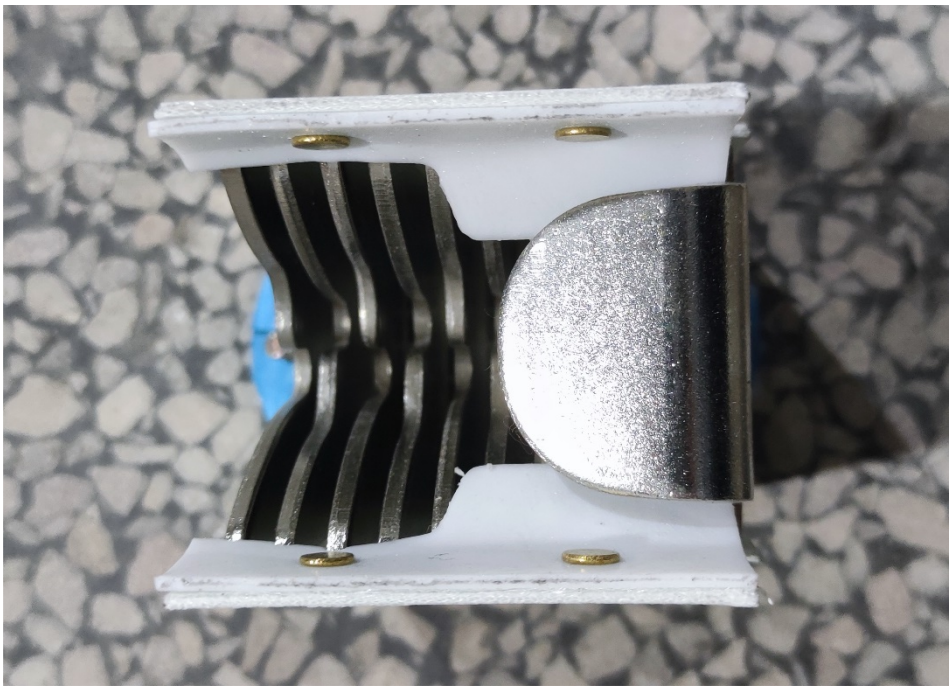
The terminal marking for control circuit

The terminal marking of protective earth

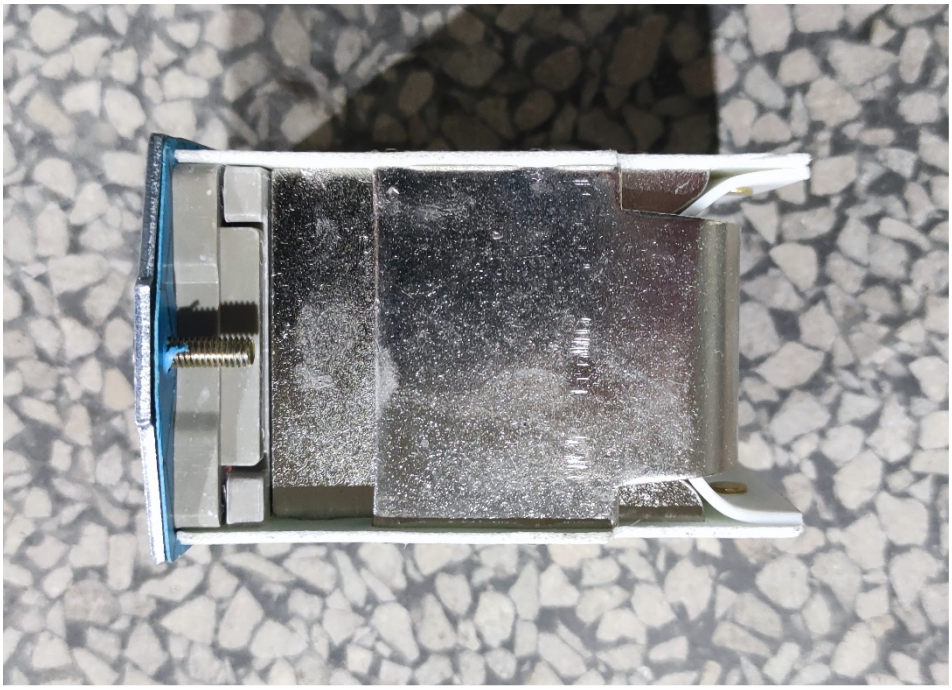


Arc chamber

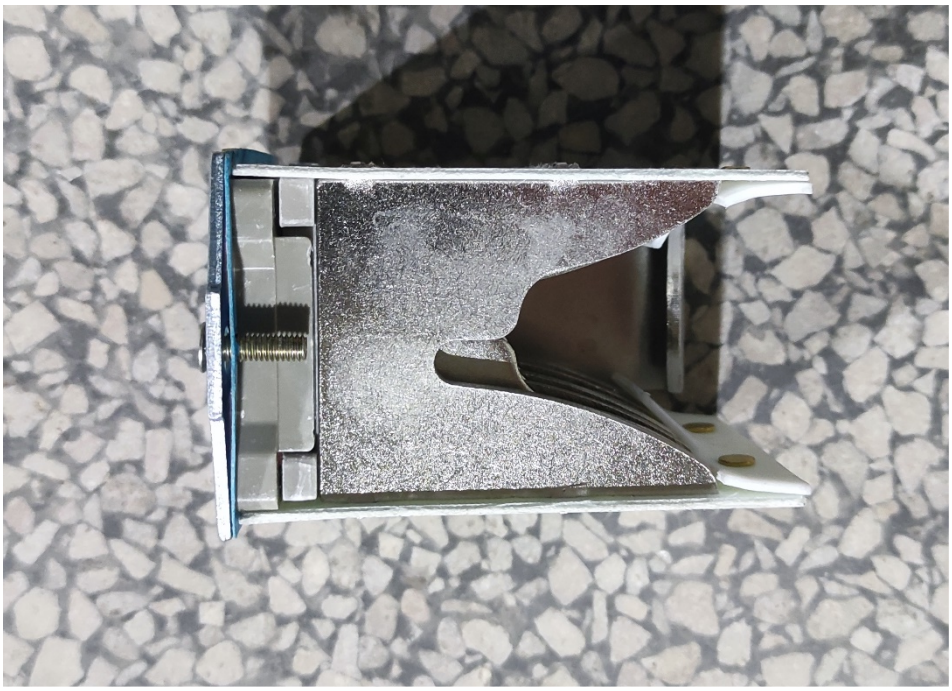
Arc chamber



Arc chamber



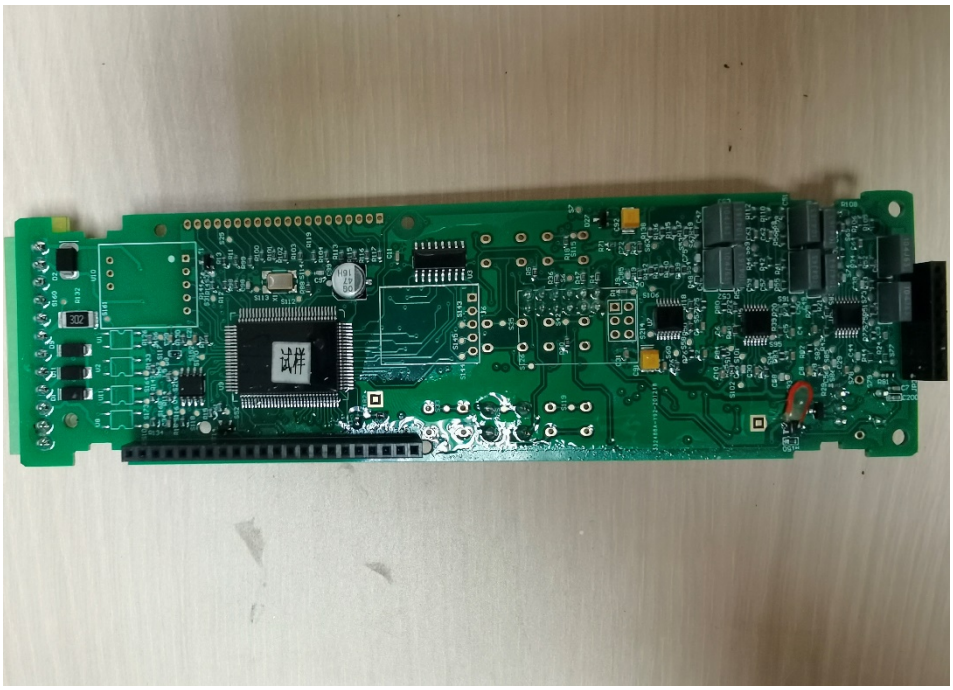
Arc chamber



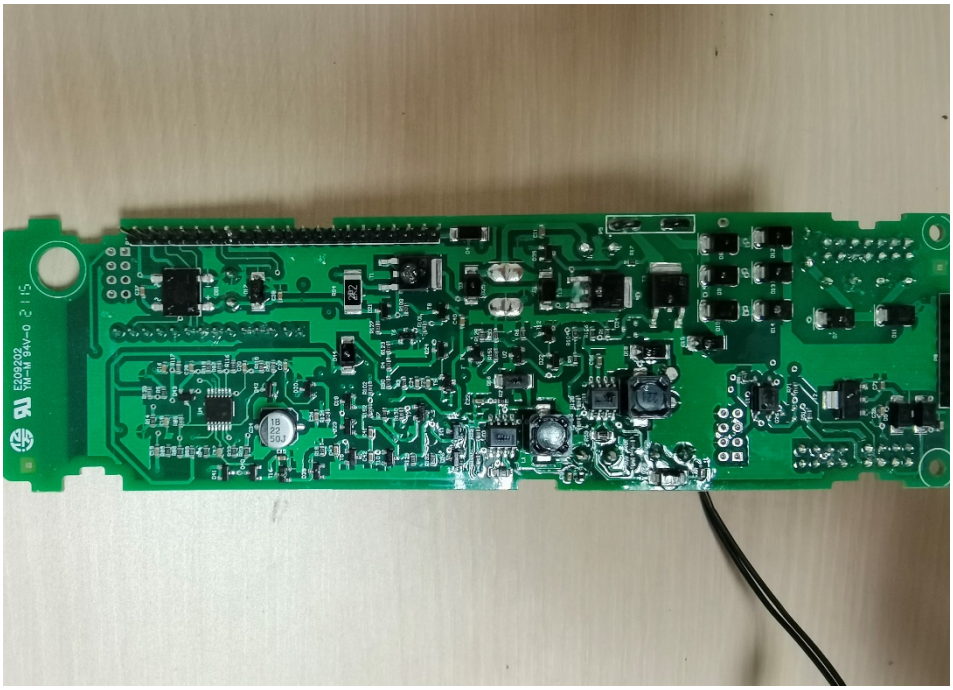
Arc chamber

Electronic trip unit of type Genius 4.0

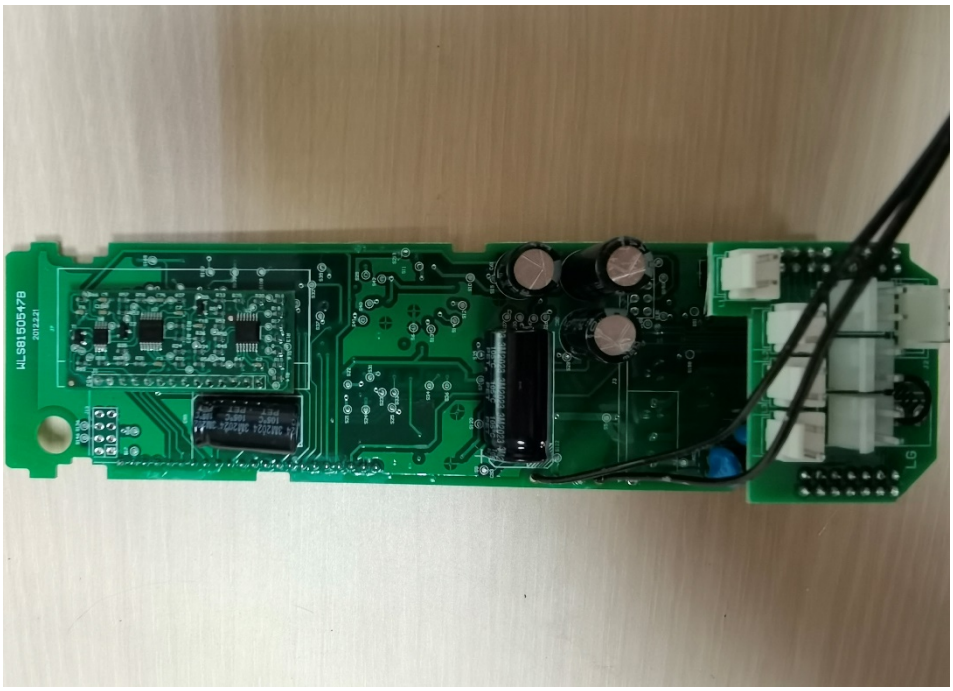
Electronic trip unit of type Genius 4.0



Electronic trip unit of type Genius 4.0



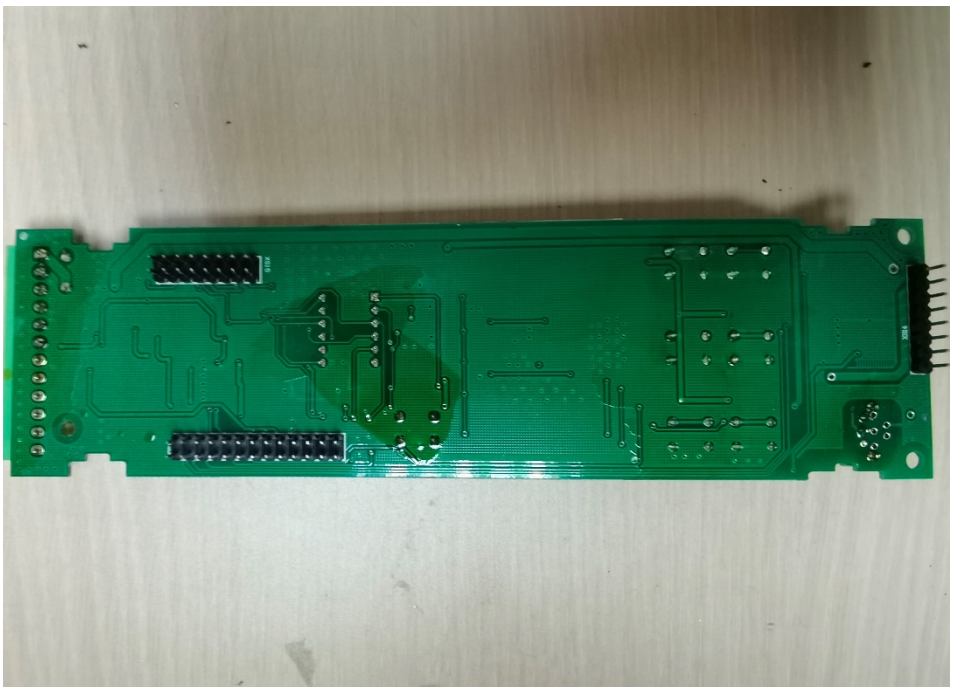
Electronic trip unit of type Genius 4.0



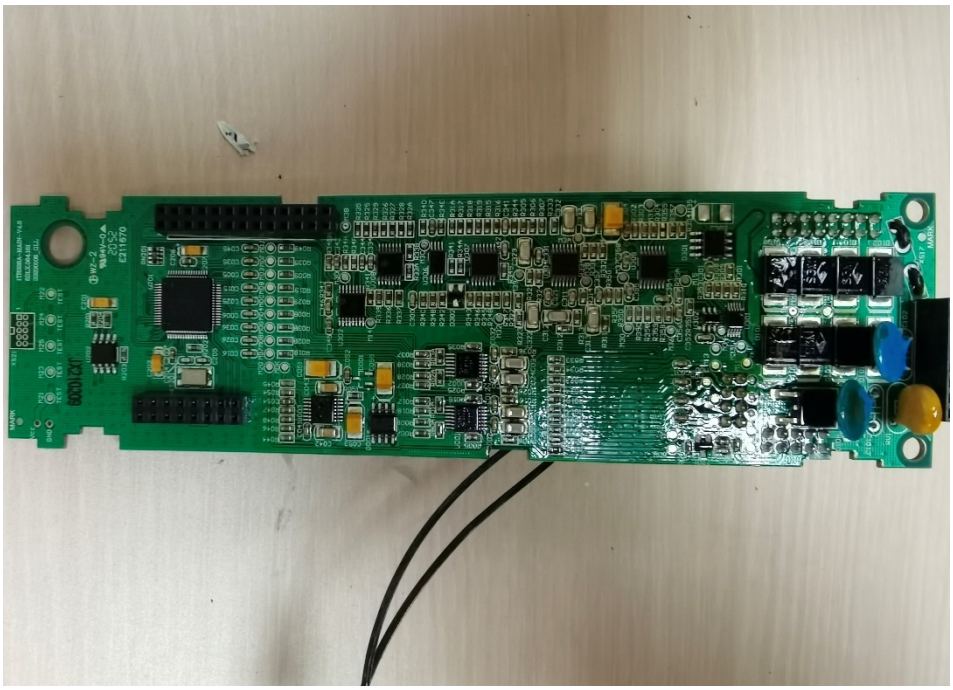
Electronic trip unit of type Genius 4.0

Electronic trip unit of type Genius 4.0A

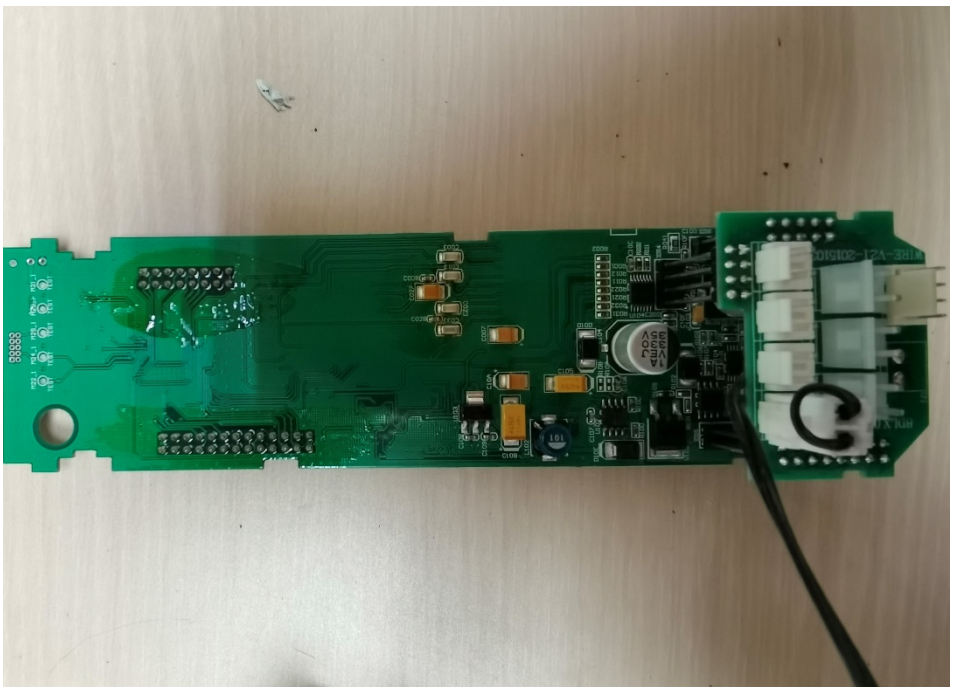
Electronic trip unit of type Genius 4.0A



Electronic trip unit of type Genius 4.0A



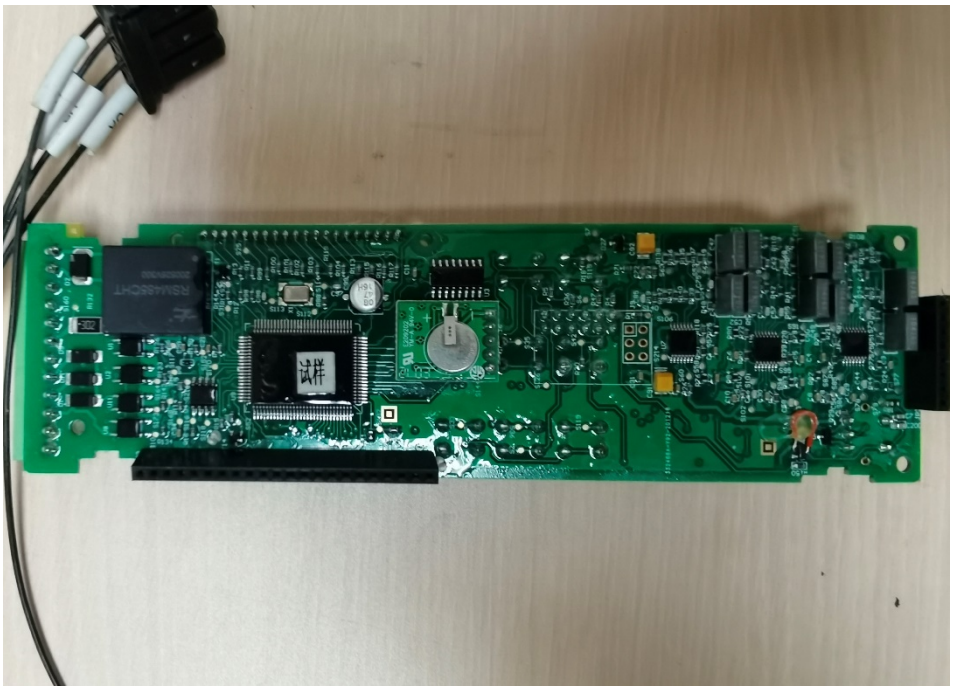
Electronic trip unit of type Genius 4.0A



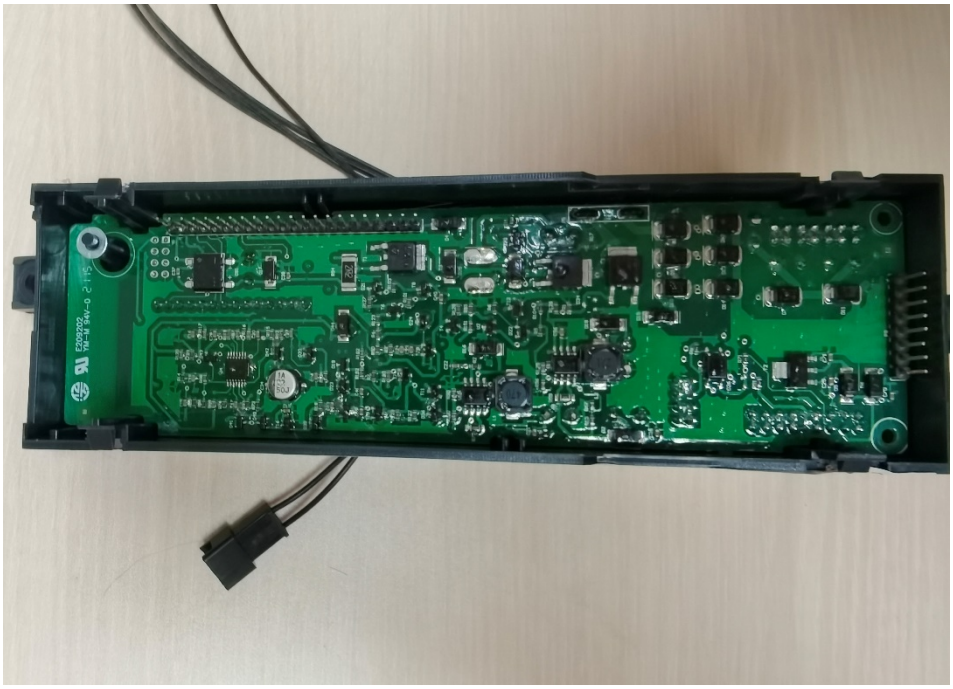
Electronic trip unit of type Genius 4.0A

Electronic trip unit of type Genius 4.0H

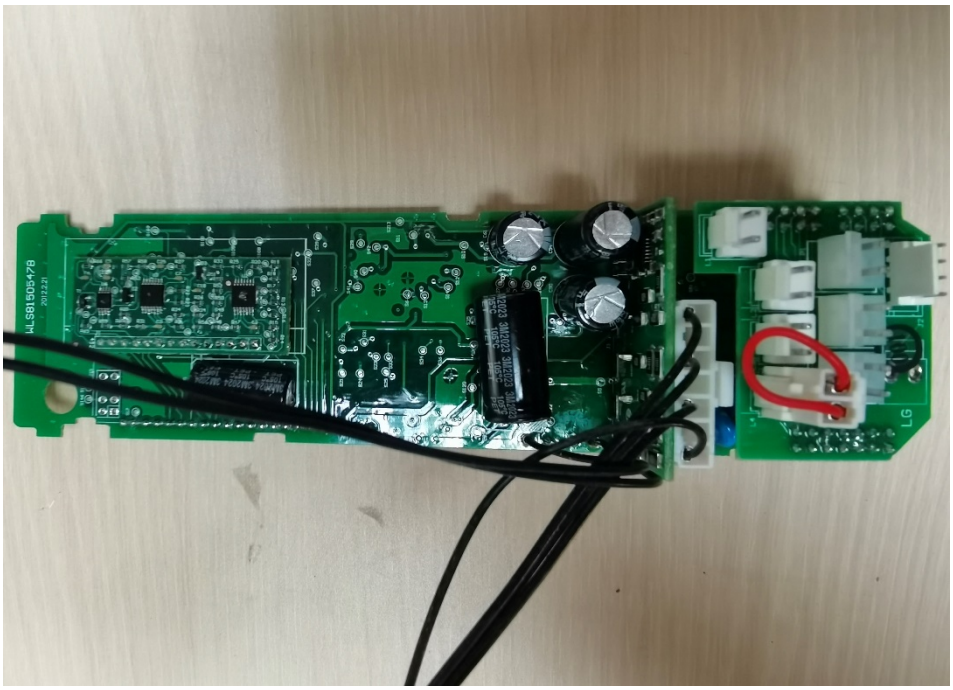
Electronic trip unit of type Genius 4.0H



Electronic trip unit of type Genius 4.0H



Electronic trip unit of type Genius 4.0H

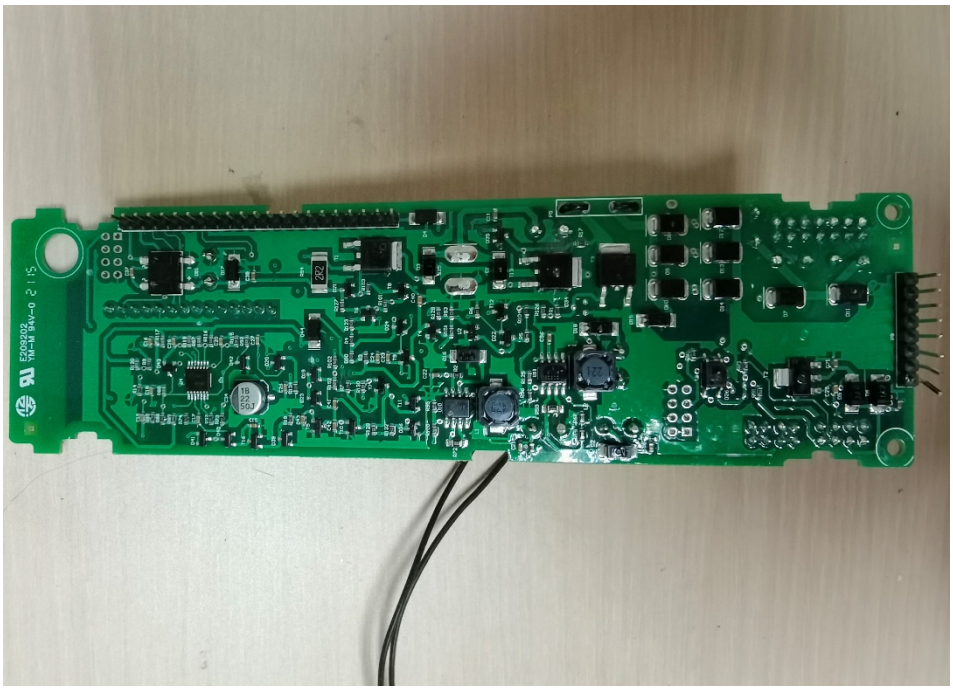


Electronic trip unit of type Genius 4.0H

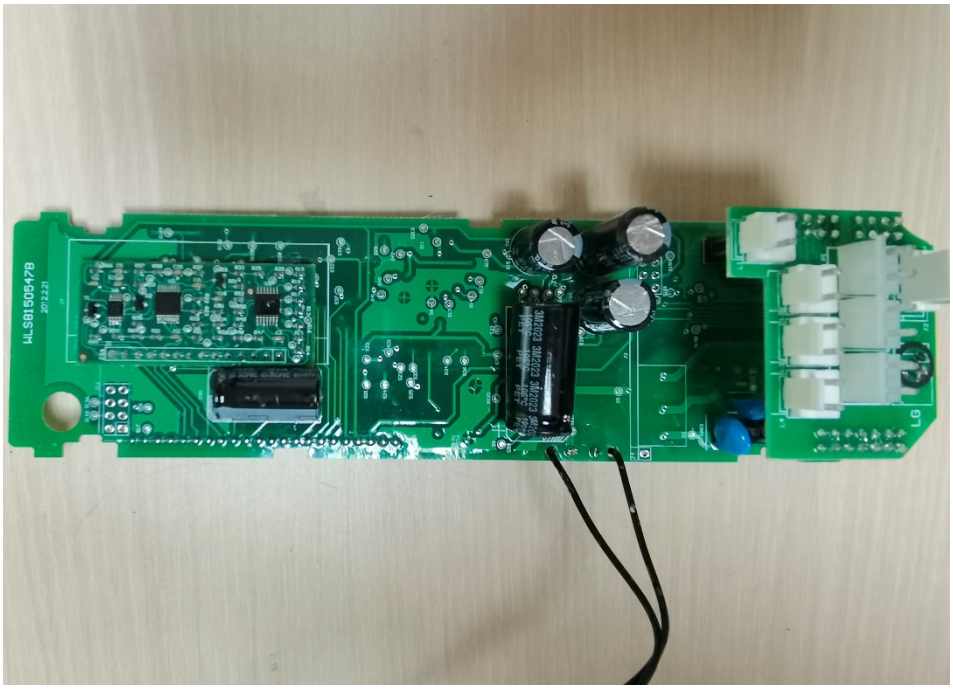
Electronic trip unit of type iTR326

Electronic trip unit of type iTR326

Electronic trip unit of type iTR326

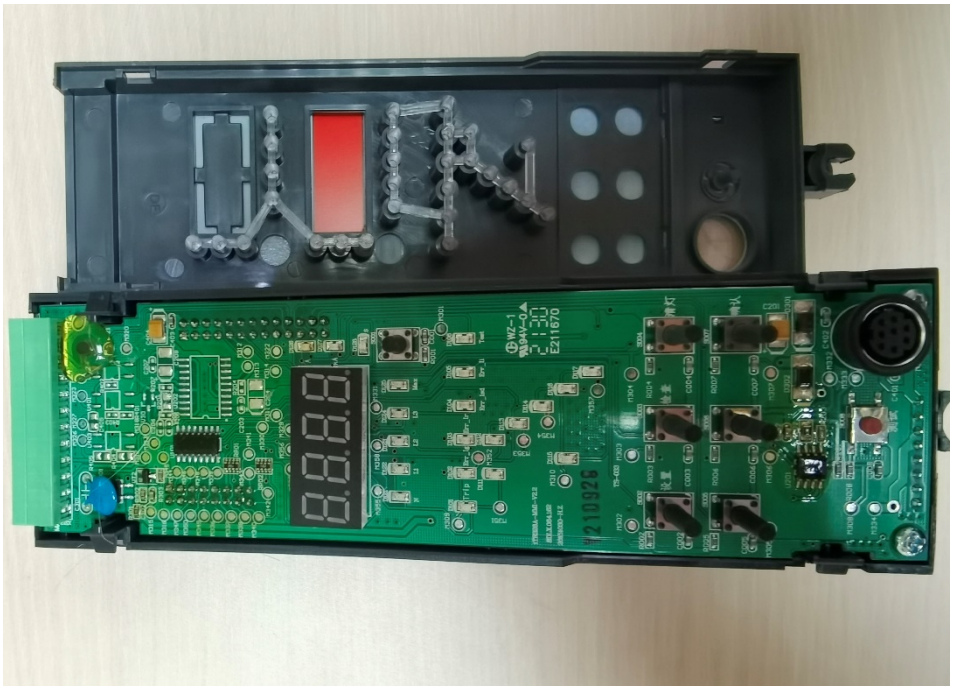


Electronic trip unit of type iTR326



Electronic trip unit of type iTR326

Electronic trip unit of type iTR326A



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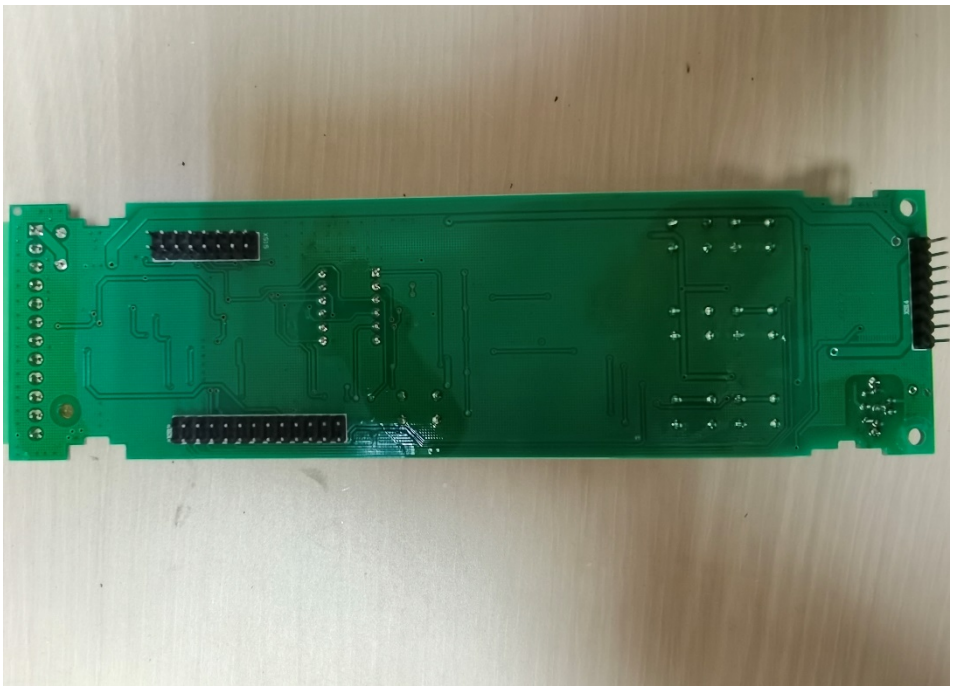

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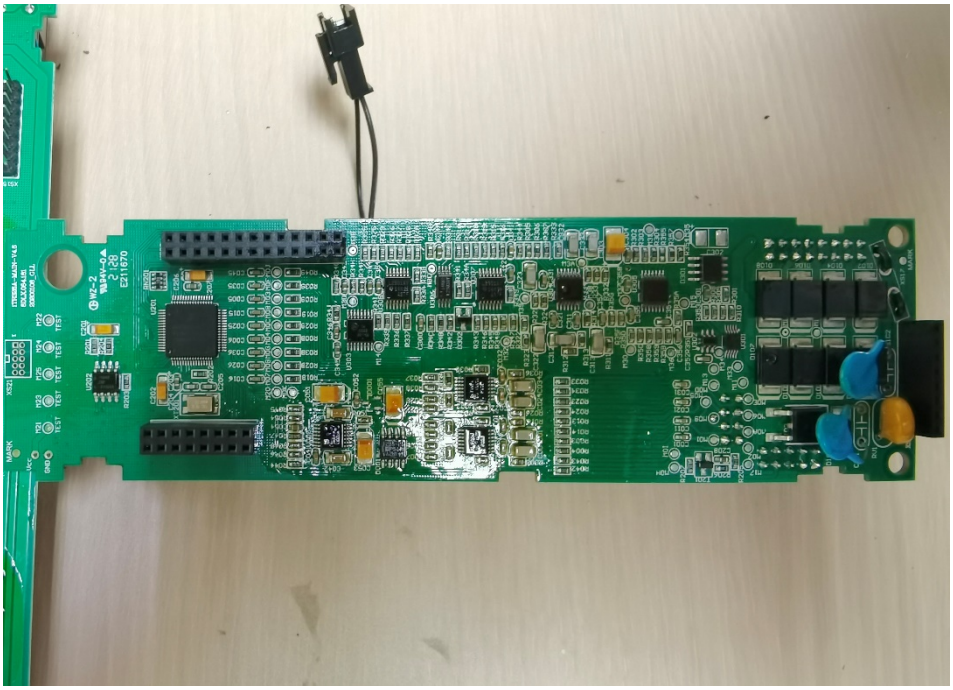

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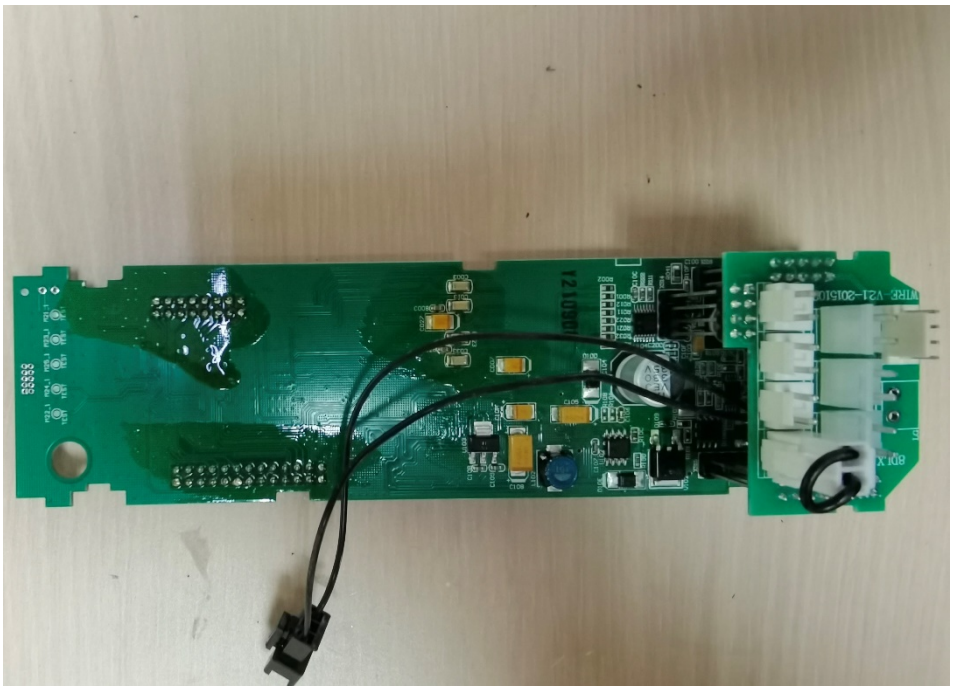
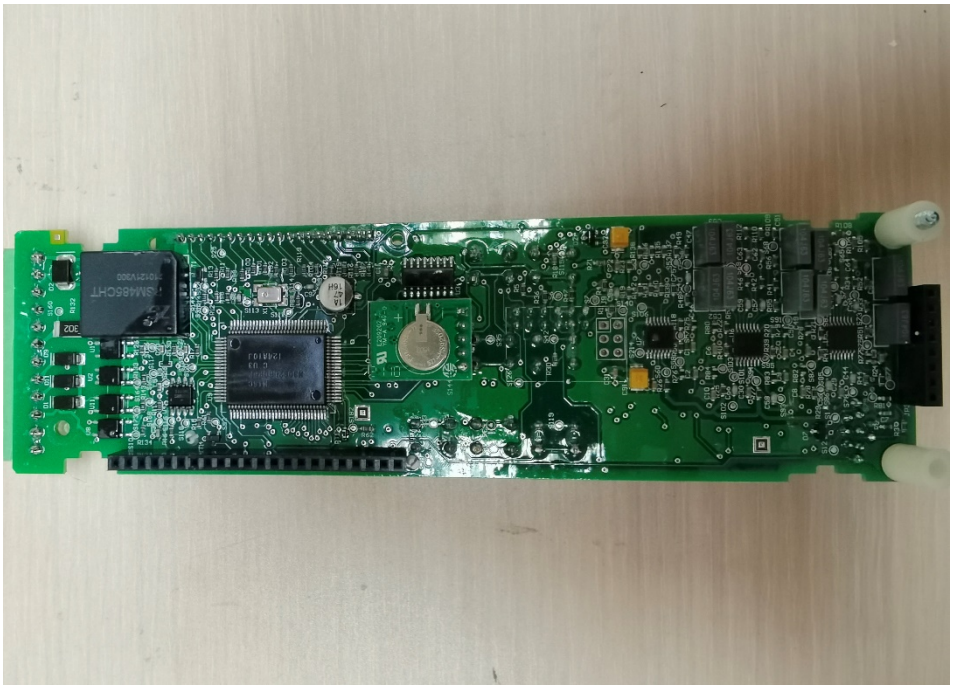


Electronic trip unit of type iTR326A

Electronic trip unit of type iTR326H

Electronic trip unit of type iTR326H



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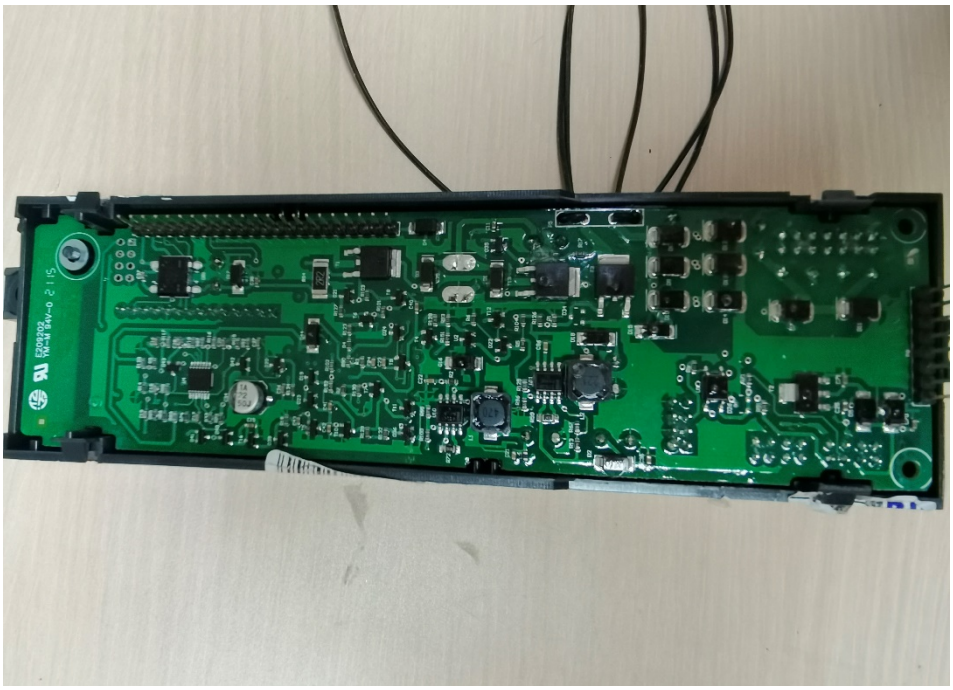
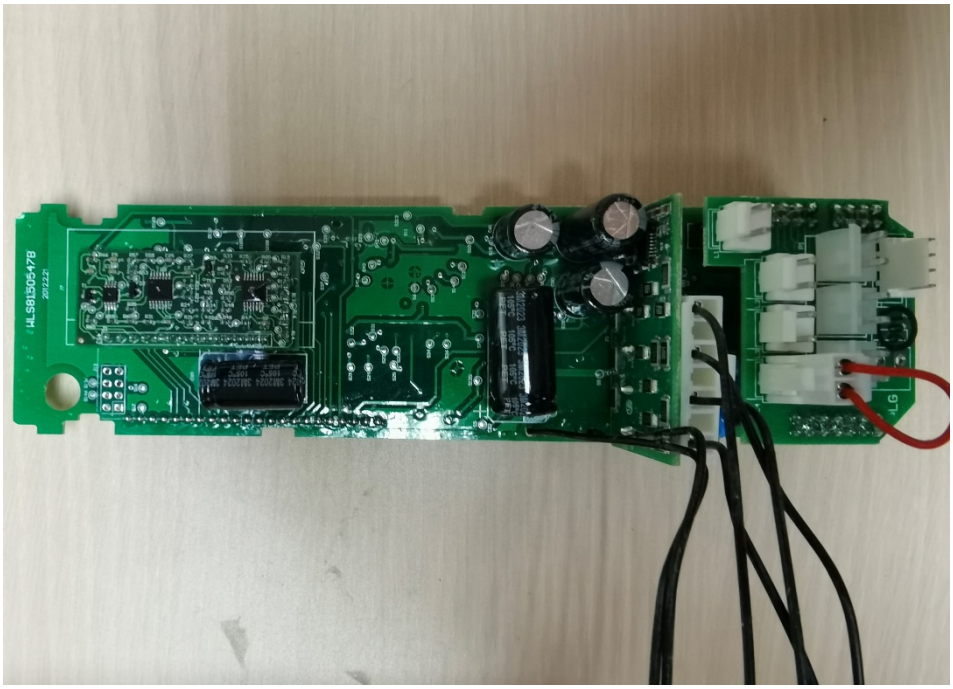


Electronic trip unit of type iTR326H



Electronic trip unit of type iTR326H

Under-voltage release & Shunt release (Closing coil)

Under-voltage release (PCB)

External supply for trip unit