Test Report issued under the responsibility of:

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

Report Number. .....:	3332214.50
Date of issue .....:	2025-01-15
Total number of pages.....	146
Name of Testing Laboratory preparing the Report.....:	DEKRA Testing Services (Zhejiang) Co., Ltd.
Applicant's name .....:	Zhejiang Geya Electrical Co., Ltd.
Address .....:	Wenzhou Great Bridge Industrial Park, North Baixiang Town, Yueqing City, 325603 Wenzhou Zhejiang, China
Test specification:	
Standard.....:	IEC 60947-2:2024 for use in conjunction IEC 60947-1:2020
Test procedure .....:	CB Scheme
Non-standard test method .....:	N/A
TRF template used.....:	IECEE OD-2020-F1:2023, Ed.1.6
Test Report Form No. .....:	IEC60947_2L
Test Report Form(s) Originator ....:	DEKRA Certification B.V.
Master TRF.....:	Dated 2024-11-28

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

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description ..... :	Moulded-Case Circuit-Breaker
Trade Mark(s)..... :	GEYA
Manufacturer ..... :	Zhejiang Geya Electrical Co., Ltd. Wenzhou Great Bridge Industrial Park, North Baixiang Town, Yueqing City, 325603 Wenzhou Zhejiang, China
Model/Type reference ..... :	GYCM8-250M, GYCM8-250H, GYCM8-250C, GYCM8-250S, GYCM8RT-250M, GYCM8RT-250H, GYCM8RT-250C, GYCM8RT-250S
Ratings ..... :	Ue: 380 / 400 / 415 Vac Ui: 1000 V, Uimp: 8 kV 3P or 4P (N pole without overcurrent protection) In: 100 A, 125 A, 140 A, 160 A, 180 A, 200 A, 225 A, 250 A Icu: 25 kA for C series, 35 kA for S series, 50 kA for M series and H series Ics: 18 kA for C series, 25 kA for S series, 35 kA for M series, 50 kA for H series

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB 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).....:		Baker Zhang (Engineer)	
Approved by (name, function, signature)...:		Eric Wang (Reviewer)	
☐	**Testing procedure: Elsewhere:**		
Testing location/ address.....:			
Tested by (name, function, signature):			
Approved by (name, function, signature)...:			

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

N/A

Summary of testing:

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

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

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

☐ **Alternative program not applicable**

Tests performed (name of test, test clause and date test performed):

Sample No.	Current (A)	Number of poles	Type	Voltage (Vac)	Short circuit current (kA)	Ref. temperature	Test sequence
1#	250	4P	GYCM8RT-250C	415	-	55 °C	I
2#	250	3P	GYCM8RT-250C	415	-	40 °C	I
3#	250	4P	GYCM8RT-250C	415	50	55 °C	II+III
4#	250	4P	GYCM8RT-250C	415	50	40 °C	II+III
5#	100	4P	GYCM8RT-250C	415	50	55 °C	II+III
6#	250	3P	GYCM8RT-250C	415	50	55 °C	III
7#	250	4P	GYCM8RT-250C	415/ √3	30	55 °C	III
8#	100	4P	GYCM8RT-250C	415/ √3	30	55 °C	III
9#	250	4P	GYCM8RT-250C	415	-	55 °C	Cl. 6, 8 & 9.2

Notes:

1. The product is a series of MCCB, there is no construction break within the frame size.
2. GYCM8RT series and GYCM8 series are fully identical except the front cover of over current trip release:
   - GYCM8RT series is with adjustable overcurrent trip release
   - GYCM8 series is formed from GYSCM8RT by solid cover of over current trip release (set at maximum Ir and Ii inside).
   Therefore, all the tests conducted on GYCM8RT series are deemed to cover GYCM8 series.
3. C series, S series, M series and H series are fully identical except rated Ics and Icu marked on the label, all tests conducted on C series with maximum short-circuit rating are deemed to cover whole series.
4. The circuit breakers with reference temperature 40 °C and 55 °C are fully identical except the distance between thermal bimetal components and leading lever.
5. There are two colours of front cover in same material: black and white, all the test is performed with black colour except sample no. 4# is with white colour, which are deemed to cover both.

Testing location:

All tests were conducted in:
DEKRA Testing Services (Zhejiang) Co., Ltd.
No. 5, Changjiang Road, Great Bridge Industrial Park, North Baixiang, Wenzhou, Zhejiang, 325603, China

Summary of compliance with National Differences

- IECEE Member countries that are also CENELEC members
  Compliance with Group Differences evaluated ☐ **yes** ☐ **No** ☒ N/A

- IECEE Member countries with published National Differences which were evaluated:
  N/A

- IECEE Member countries that did not publish any National Differences:
  N/A

To support compliance with published National Differences, attach a compilation of relevant ND and/or GD TRFs to the CB Test Report

Use of uncertainty of measurement for decisions on conformity (decision rule) :

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other: … (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.
IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

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

Copy of marking plate:

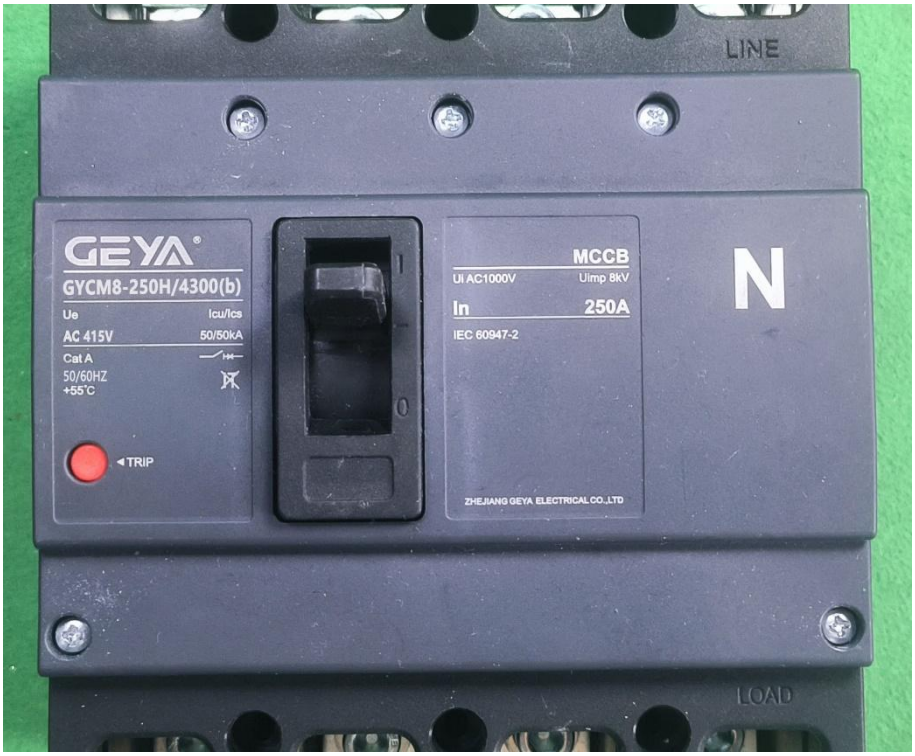
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective Certification Bodies that own these marks.

GYCM8RT-250C/4300(b), 250 A, 4P

GYCM8RT-250M/3300(w), 100 A, 3P

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective Certification Bodies that own these marks.



GYCM8-250H/4300(b), 250 A, 4P

Test item particulars: test item vs. test requirements	
4. Classification	
4.1. Selectivity category: (A or B). .....:	A
4.2. Method of controlling the operation mechanism: (dependent manual, independent manual, dependent power, independent power, stored energy operation) .....:	Independent manual
4.3. Provision for maintenance: (maintainable, non-maintainable) .....:	Non-maintainable
4.4. Method of installation: (fixed, plug-in, withdrawable) ....:	Fixed
4.5. Degree of protection of enclosure: (IP code) .....:	IP20 (only front side)
5.7. Type of release (thermo-magnetic / electronic) .....:	Thermo-magnetic
5.8. Integral fuses (integrally fused circuit-breakers) Type and characteristics of SCPD .....:	N/A
8.3 Electromagnetic compatibility (EMC) Environment A or B .....:	A and B
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: U_e (V) .....:	380 / 400 / 415 Vac
- rated insulation voltage: U_i (V) .....:	1000 V
- rated impulse withstand voltage: U_{imp} (kV) .....:	8 kV
- rated current: I_n (A) .....:	100 A, 125 A, 140 A, 160 A, 180 A, 200 A, 225 A, 250 A
- kind of current (AC, DC) .....:	AC
- conventional free air thermal current: I_{th} (A).....:	Equal to In
- conventional enclosed thermal current: I_{the} (A).....:	N/A
- current rating for four-pole circuit-breakers: (A).....:	Equal to In
- number of poles .....:	3P or 4P (N pole without overcurrent protection)
- rated frequency: (Hz) .....:	50 / 60 Hz
- integral fuses (rated values) .....:	N/A
Rated duty :	
- eight-hour duty .....:	N/A
- uninterrupted duty: I_u (A).....:	Equal to In

Short-circuit characteristic :	
rated short-time making capacity: I_{cm} (kA) ..... :	52,5 kA for C series, 73,5 kA for S series, 105 kA for M series and H series
rated ultimate short-circuit breaking capacity: I_{cu} (kA) .. .. :	25 kA for C series, 35 kA for S series, 50 kA for M series and H series
rated service short-circuit breaking capacity: I_{cs} (kA)..... :	18 kA for C series, 25 kA for S series, 35 kA for M series, 50 kA for H series
rated short-time withstand current: I_{cw} (kA/s) ..... :	N/A
rated individual pole ultimate short-circuit breaking capacity at phase-to-neutral AC voltage: I_{cu1} (kA) ..... :	N/A
Control circuits :	
Electrical control circuits :	
- kind of current: (AC, DC) ..... :	N/A
- rated frequency: (Hz) ..... :	N/A
- rated control circuit voltage: Uc (AC, DC, V) ..... :	N/A
- rated control circuit supply voltage: Us (AC, DC, V) ..... :	N/A
Air supply control circuits: (pneumatic or electro-pneumatic):	
- rated pressure and its limit ..... :	N/A
- volumes of air, at atmospheric pressure, required for each closing and each opening operation ..... :	N/A
Auxiliary circuits :	
Rated and limiting values, auxiliary circuits ..... :	N/A
- rated operational voltage U_e (V) ..... :	N/A
- rated insulation voltage: U_i (V) ..... :	N/A
- rated impulse voltage: U_{imp} (kV) ..... :	N/A
- rated operational current: I_e (A) ..... :	N/A
- kind of current (AC, DC) ..... :	N/A
- rated frequency: (Hz) ..... :	N/A
- number of circuits ..... :	N/A
- number and kind of contact elements ..... :	N/A
- rated uninterrupted current: I_u (A) ..... :	N/A
- utilization category: (AC, DC, current and voltage) ..... :	N/A
Short-circuit characteristic :	
- Rated conditional short-circuit current (kA) ..... :	N/A
- kind of protective device ..... :	N/A

Releases :	
1) shunt release ..... :	N/A
2) Over-current release..... :	Yes
a) instantaneous..... :	Yes
b) definite time delay..... :	N/A
c) inverse time delay..... :	Yes
- independent of previous load ..... :	N/A
- dependent on previous load; (for example thermal type release)..... :	Yes, thermal type release
d) ground-fault..... :	N/A
3) Undervoltage release (for opening) ..... :	N/A
4) Closing releases ..... :	N/A
5) Other releases ..... :	N/A
Characteristics :	
1) Shunt release and undervoltage release (for opening), and closing release ..... : ..... :	N/A
- rated control circuit voltage: Uc (AC, DC, V) ..... :	N/A
- kind of current ..... :	N/A
- rated frequency: (if AC) ..... :	N/A
2) Over-current release..... :	
- rated current..... :	100 A, 125 A, 140 A, 160 A, 180 A, 200 A, 225 A, 250 A
- kind of current ..... :	AC
- rated frequency: (if AC) ..... :	50 / 60 Hz
- current setting (or range of settings) ..... :	Ir (inverse time delay current setting): GYCM8RT series: (0,7, 1) x In GYCM8 series: fixed Ii (instantaneous tripping setting): GYCM8RT series: (5, 10) x In GYCM8 series: fixed, Ii = 10 In
- time settings (or range of settings)..... :	tr (inverse time delay time setting): Fixed, tripping time at 2 In or Ir: 40 s ≤ t ≤ 1000 s

Test item particulars..... :	Moulded-Case Circuit-Breaker
Classification of installation and use..... :	Fixed
Supply Connection..... :	3 phases and 3 phases 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 .....:	2024-08-19
Date (s) of performance of tests.....:	2024-08-28 - 2024-12-23

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) .....:	Zhejiang Geya Electrical Co., Ltd. Wenzhou Great Bridge Industrial Park, North Baixiang Town, Yueqing City, 325603 Wenzhou Zhejiang, China

General product information and other remarks:

Nomenclature breakdown:

GYCM8RT-250 M (b)
a b c d

a = Model name: “GYCM8” means fixed type, “GYCM8RT” means adjustable type
b = Frame size: 250
c = short-circuit capacity: “C”, “S” “M” or “H”
d = Color of Front cover: “w” means white “b”, “b” means Black

Connection: copper conductor with cable lug

Although it is not on the front page, the following standards are considered:

EN IEC 60947-1: 2021

EN 60947-2: 2017 + A1: 2020

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

6.2	**MARKING** GYCM8RT-250C, 250 A, 4P, reference temperature: 55 °C, sample no. 9#		
	Visible from the front when the circuit-breaker is installed as in service and actuator is accessible:		
1.1	- rated current (I_n):	250 A	P
1.2	- suitability for isolation, with the symbol  (IEC 60617-S00287:2001-07 combined with IEC 60617-S00220:2001-07)		P
1.3	- indication of the open and closed position: with (IEC 60417-5008:2002-10)and I (IEC 60417-5007:2002-10) respectively, if symbols are used (see 8.1.6 of IEC 60947-1:2020)		P
	Marked on the circuit-breaker:		
2.1	- manufacturer's name or trade mark:	GEYA	P
2.2	- type designation or catalogue reference:	GYCM8RT-250C/4300(b)	P
2.3	- IEC 60947-2, if the manufacturer claims compliance with this standard:	IEC 60947-2	P
2.4	- selectivity category A or B:	A	P
2.5	- rated operational voltage(s) U_e (see 5.3.2.1 and, where applicable, Annex H):	AC 415 V	P
2.6	- Indication that the circuit-breaker is not suitable for IT systems at all rated voltages with the symbol  (IEC 60417-6363:2016-07). For any exception for specific rated voltages, see H.5.		P
2.7	-rated impulse withstand voltage (U_{imp});	8 kV	P
2.8	- value (or range) of the rated frequency and/or the indication “d.c” (or the symbol ⎓(IEC 60417-5031:2002-10):	50 / 60 Hz	P
2.9	- rated service short-circuit breaking capacity (I_{cs}) at the corresponding rated voltage (Ue):	18 kA	P
2.10	- rated ultimate short-circuit breaking capacity (I_{cu}) at the corresponding rate voltage (Ue):	25 kA	P
2.11	- rated individual pole ultimate short-circuit breaking capacity at phase-to-neutral AC voltage (*I*cu1), at the corresponding rated voltage (*U*e), if different from $I_{cu:}$		N/A
2.12	- rated short-time withstand current (Icw) and associated short-time delay, for selectivity category B:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.13	- range of the current setting (I_r) of the adjustable overload release (may be displayed):	(0,7, 1) x In	P
2.14	- value or range (when adjustable) of the short-time pick-up current setting (I_{sd}) of the release and its intended time-delay (t_{sd}), when applicable (may be displayed):		N/A
2.15	- range of the ground-fault current (I_g) of the adjustable release, when applicable (may be displayed):		N/A
2.16	- range of the instantaneous short-circuit current setting (I_i), for adjustable releases (may be displayed):	(5, 10) x In	P
2.17	- ref. temperature for non-compensated thermal releases, if different from 30 °C	55 °C	P
2.18	- terminals identification, according to 8.1.8.4 of IEC 60947-1:2020:		N/A
	- terminal of coils (A/B)		N/A
	- terminal of shunt release (C)		N/A
	- terminals of under-voltage release (D)		N/A
	- terminals of interlocking electromagnets (E)		N/A
	- terminals of indicated light devices (X)		N/A
	- terminals of contact elements for switching devices (no.)		N/A
2.19	- identification of line and load terminals, if applicable	LINE/LOAD	P
2.20	- neutral pole terminals, if applicable, by the letter N	N	P
2.21	- protective earth terminal, where applicable, by the symbol (IEC 60417-5019:2006-08) ⏚ (see 8.1.10.3 of IEC 60947-1:2020)		N/A
	Provided in the manufacture's literature:		
3.1	- rated short-circuit making capacity (I_{cm}) at the corresponding rated voltage (U_e), if higher than that specified in 5.3.6.1		N/A
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 (see 7.1.3.2 of IEC 60947-1:2020):		N/A
3.4	- conventional enclosed thermal current (I_{the}) if different from the rated current:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
3.5	- IP Code, where applicable (see Annex C of IEC 60947-1:2020):	IP20 (only front side)	P
3.6	- when applicable 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:	Up / Down: 80 mm Left / Right: 0 mm Front / Back: 0 mm	P
3.8	- suitability for environment A or B per annex J, as applicable:	Both A and B	P
3.9	- RMS sensing, if applicable, accordance with F.4.1.1		N/A
3.10	- minimum cable cross-section, if different from Table 9 of IEC 60947-1:2020, 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:	M8 / 6 Nm	P
3.12	- current derating, when applicable, for temperatures higher than the reference temperature:		N/A
3.13	- influence of ambient temperature, if applicable, on the tripping performance of the overcurrent release (see 5.7.3):		N/A
3.14	- current derating for terminals and connections, if applicable:		N/A
3.15	- method and diagram of series connection of poles (as necessary for each rating) for DC circuit-breakers:		N/A
3.16	- type of ground-fault detection function (See T.4 of IEC 60947-1:2020):		N/A
3.17	- value of the instantaneous short-circuit current setting (I_i), for non-adjustable releases:		N/A
3.18	number of poles:	4P	P
3.19	further information concerning aluminum conductors (See D.5.2):		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 3.19) and/or motor-operators, rated control circuit voltage, kind of current and rated frequency for AC:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
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 AC:		N/A
4.3	- rated current of indirect over-current releases (see 5.7.3):		N/A
4.4	- number and type of auxiliary contacts, rated operational currents at the rated operational voltages, and rated frequency for AC:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.1	**CONSTRUCTION** GYCM8RT-250C, 250 A, 4P, reference temperature: 55 °C, sample no. 9#		
8.1.2 part 1	Materials		
8.1.2.2	Glow wire testing		
	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
	a) Where, in 8.1.2.2 of IEC 60947-1:2020, the test temperature is to be specified, the value required by this document for the parts necessary to retain in position current-carrying parts is 960 °C for the main circuit and 850 °C for the other circuits.	See TABLE 9	P
	b) The requirements of 8.1.2 of IEC 60947-1:2020 do not apply to parts with a mass lower than 2 g (insignificant mass, in accordance with 3.14 of IEC 60695-2-11:2021). For products containing more than one small part, the total mass of non-tested parts located within 3 mm of each other shall not exceed 10 g.		N/A
	When aluminum conductors are to be used, annex D applies.		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		P
	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		
	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		
	No visible flame and no sustained glowing		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Flames and glowing extinguish within 30 s		N/A
	No ignition of the tissue paper		P
8.1.2.3	Test based on flammability category		
	For parts of insulating materials, hot wire ignition (HWI) and, where applicable, arc ignition (AI) tests as specified in 9.2.2.2, 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
8.1.3 part 1	Current-carrying parts and their connections		
	Current-carrying parts shall have the necessary mechanical strength and current-carrying capacity for their intended use		P
	For electrical connections, no contact pressure shall be 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
	Compliance shall be verified by inspection and by conducting the test sequences according to the relevant product standard.		P
8.1.5 part 1	Actuator		
8.1.5.1	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
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.1.5.2	Direction of movement		
	The direction of operation for actuators of devices shall normally conform to IEC 60447.		P
	Where devices cannot conform to these requirements, e.g. due to special applications or alternative mounting positions, they shall be clearly marked such that there is no doubt as to the ”I” and ”O” positions and the direction of operation		P
8.1.6 part 1	Indication of contact position		
8.1.6.1	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 3.5.18)		P
	If symbols are used, they shall indicate the closed and open position respectively, in accordance with IEC 60417:		
	- IEC 60417-5007 (2002-10) **I** On (power)		P
	- IEC 60417-5008 (2002-10) **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”		N/A
	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		N/A
8.1.6.2	Indication by the actuator		
	When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided		P
8.1.8 part 1	Terminals		
8.1.8.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal connections shall be such that necessary contact pressure is maintained		P
	Terminals shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal		P
	Terminal shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage shall not be reduced below the rated value		P
	If required by the application, terminals and conductors may be connected by means of cable lugs for copper conductors only (see Table P.1).		P
	Screwless-type clamping units, unless otherwise specified by the manufacturer, shall accept solid, stranded and flexible conductors as indicated in Table 1.		N/A
	On screwless-type clamping unit, the connection or disconnection of conductors shall be made as follows:		
	- on universal clamping units by the use of a general purpose tool or a convenient device, integral with the clamping unit to open it for the insertion or withdrawal of the conductors		N/A
	- on push-wire clamping units by simple insertion. For the disconnection of the conductors an operation other than a pull only on the conductor shall be necessary. The use of a general purpose tool or of a convenient device, integral with the clamping unit is allowed in order to "open" it and to assist the insertion or the withdrawal of the conductor		N/A
	The requirements of this subclause shall be verified by the tests of 9.2.5.2, 9.2.5.3 and 9.2.5.4, as applicable.		N/A
8.1.8.2	Connection capacity		
	Type of conductors (solid or stranded or flexible):	Copper conductor with cable lug	P
	Minimum cross-sectional area of conductor (mm^2):	16 mm^2	P
	Maximum cross-sectional area of conductor (mm^2):	120 mm^2	P
	Number of conductors simultaneously connectable to the terminal:	1	P
8.1.8.3	Connection		
	Terminals for connection to external conductors shall be readily accessible during installation		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Clamping screws and nuts shall not serve to fix any other component		P
8.1.8.4	Terminal identification and marking		
	Terminals intended exclusively for the neutral conductor shall be identified by the letter "N", in accordance with IEC 60445.	N is marked for 4P	P
	The protective earth terminal shall be identified in accordance with 8.1.10.3.		N/A
	Other terminals		N/A
8.1.10 part 1	Provisions for protective earthing		
8.1.10.1	The exposed conductive parts (e.g. chassis, framework and fixed parts of metal enclosures) other than those which cannot constitute a danger shall be electrically interconnected and connected to a protective earth terminal for connection to an earth electrode or to an external protective conductor		N/A
	This requirement can be met by the normal structural parts providing adequate electrical continuity and applies whether the equipment is used on its own or incorporated in an assembly		N/A
	Exposed conductive parts are considered not to constitute a danger if they cannot be touched on large areas or grasped with the hand or if they are of small size (approximately 50 mm x 50 mm) or are so located as to exclude any contact with live parts		N/A
8.1.10.2	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. The size of the protective conductor shall be in accordance to Table 25.		N/A
	The protective earth terminal shall be suitably protected against corrosion		N/A
	In the case of equipment with conductive structures, enclosures, etc., means shall be provided, if necessary, to ensure electrical continuity between the exposed conductive parts the equipment and the metal sheathing of connecting conductors		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The protective earth terminal shall have no other function, except when it is intended to be connected to a PEN conductor (see 3.3.29), PEM conductor (see 3.3.28) or PEL conductor (see 3.3.30). In this case, it shall also have the function of a neutral terminal in addition to meeting the requirements applicable to the protective earth terminal		N/A
8.1.10.3	Protective earth terminal marking and identification		
	The protective earth terminal shall be clearly and permanently identified by its marking		N/A
	The identification shall be achieved by colour (green-yellow mark) or by the notation PE, PEN, PEM or PEL, as applicable, in accordance with 7,3 of IEC 60445:2017, or by a graphical symbol for use on equipment		N/A
	Graphical symbol to be used: 60417 -5019 ⏚ (2006-08) Protective earth (ground) in accordance with IEC 60417 database		N/A
8.1.10.4	Protective earth continuity		
	All exposed conductive parts of the equipment and/or its enclosure connected to the terminal for the incoming external protective conductor.		N/A
	The resistance of the circuit from the exposed conductive part to the protective earth terminal shall not exceed 0,1 Ω.		N/A
8.1.11 part 1	Dedicated enclosure for equipment		
8.1.11.1	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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
8.1.11.2	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
8.1.12 part 1	Degree of protection of enclosed equipment		
	Degree of protection.	IP20 Note: The MCCB is an un-enclosed equipment. This clause is therefore not applicable. But the IP20 was check on the front side of the MCCB.	
	Test for first characteristic.	IP2X	
	Test for first numeral (1, 2, 3, 4, 5, 6) ..... :	2 (only front side)	P
	Test for second characteristic	IPXX	
	Test for second numeral (1, 2, 3, 4, 5, 6, 7, 8) ..... :		N/A
8.1.13 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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Compliance shall be verified by the test of 9.2.8		N/A
8.1.2	Withdrawable circuit-breaker		
	In the disconnected position (main- and auxiliary circuits)		
	Isolating distances for circuit-breaker suitable for isolating comply with the requirements specified for the isolating function		N/A
	Mechanism fitted with a reliable indicating device with indicates the position of the isolating contacts.		N/A
	Mechanism fitted with interlocks which only permit the isolating contacts to be separate or re-closed when main contacts are open		N/A
	Mechanism fitted with interlock, which only permit the main contacts to be closed when the isolating contacts are fully closed		N/A
	– when the isolating contacts are fully closed, or		N/A
	– when the specified isolating distance is achieved between the fixed and moving parts of the isolating contacts (disconnected position).		N/A
	In disconnected position, the isolating distances between the isolating contacts cannot be inadvertently reduced.		N/A
8.1.3	Isolation		
8.1.7 part 1	Additional safety requirements for equipment suitable for isolation		
8.1.7.1	Additional constructional requirements		
	Equipment suitable for isolation shall provide in the open position (see 3.6.21) an isolation distance in accordance with the requirements necessary to satisfy the isolating function (see 8.2.3.2 and 8.2.7). Indication of the position of the main contacts shall be provide by one or more of the following means:		
	- the position of the actuator		P
	- a separate mechanical indicator		N/A
	- visibility of the moving contacts		N/A
	The effectiveness of each of the means of indication provided on the equipment and its mechanical strength shall be verified in accordance with 9.2.6.		P
	When means are provided or specified by the manufacturer to lock the equipment in the open position, locking in that position shall only be possible when the main contacts are in the open position		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Equipment shall be designed so that the actuator, front plate or cover are fitted to the equipment in a manner which ensures correct contact position indication and locking, if provided.		P
	If auxiliary contacts are provided for interlocking purposes, the operating time of the auxiliary and main contacts shall be declared by the manufacturer. More specific requirements may be given in the relevant product standard.		N/A
	The indicated open position is the only position in which the specified isolation distances between the contacts is ensured.		P
	For equipment provided with actuator or indicator positions such as “tripped position”, which are not the indicated open position, those positions shall be clearly identified. The marking of such positions shall not include the symbols “I” or “O”.		P
	An actuator having only one position of rest shall not be considered as appropriate to indicate the position of the main contact.		N/A
8.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		
	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
	Auxiliary switch shall be rated according to IEC 60 947-5-1		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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	During the closing operation the contacts of the auxiliary switch shall close after or simultaneously with the contacts of the main poles		N/A
	A suitable opening time interval may also be provided by an intermediate position (between the ON and OFF position) at which the interlocking contact(s) is (are) open and the main poles remain closed		N/A
8.1.7.3	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
	When the equipment is locked by even of a single padlock, it shall not be possible by operating the actuator, to reduce the clearance between open contacts to the extent that it no longer complies with the requirements of 8.2.3.2 1) b).		N/A
	Alternatively, the design may provide padlockable means to prevent access to the actuator		N/A
	Compliance with the requirements to padlock the actuator shall be verified using a padlock specified by the manufacturer or an equivalent gauge, giving the most adverse conditions, to simulate locking.		
	The force *F* specified in 9.2.6.2.1 shall be applied to the actuator in an attempt to operate the equipment from the open position to the closed position (N):		N/A
	Whilst the force *F* is applied the equipment shall be subjected to a test voltage across open contacts.		N/A
	The equipment shall be capable of withstanding the test voltage required according to Table 14 appropriate to the rated impulse withstand voltage.		N/A
8.1.4	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:	8 kV	
	- max. value of rated operational voltage to earth	600 V	
	- nominal voltage of supply system:	380 Vac / 400 Vac / 415 Vac	
	- overvoltage category:	III	
	- pollution degree:	3	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- field-in or homogeneous:	Inhomogeneous field	
	- minimum clearances (mm):	8 mm	
	- measured clearances (mm):	Min measured value: 17,0 mm See TABLE 8	P
	For U_{imp} values exceeding the values given in Table 13 of IEC 60947-1: 2020, clearances shall be obtained from Table F.2 of IEC 60664-1:2020.		N/A
	Creepage distances:		
	- rated insulation voltage Ui (V)	1000 V	
	- pollution degree	3	
	- comparative tracking index (V)	175 V	
	- material group	IIIa	
	- minimum creepage distances (mm)	16 mm	
	- measured creepage distances (mm)	Min measured value: 21,9 mm See TABLE 8	P
8.1.5	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
	Compliance is checked by the provisions of 9.3.3.6.1, item b).		P
8.1.6	List of construction breaks		
	Circuit-breakers of a given frame size are considered to have a construction break (see 3.1.2) if any one of the following features are not the same:		
	- material, finish and dimensions of internal current-carrying parts, admitting, however, the variations listed in a), b), c), f) and g) below;		N/A
	- size, material, configuration and method of attachment of the main contacts;		N/A
	- any integral manual operating mechanism, its materials and physical characteristics;		N/A
	- moulding and insulating materials;		N/A
	- the principle of operation, materials and construction of the arc extinction device;		N/A
	- the basic design of the overcurrent tripping devices, admitting, however, the variations detailed in a), b) and c) below.		N/A
	Variations in the following do not constitute a construction break:		
	a) dimensions of terminals, provided that creepage and clearance distances are not reduced;		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	b) in the case of thermal and magnetic releases those dimensions and materials of the release components, including flexible connections, which determine the current rating;		P
	c) secondary windings of current transformer operated releases;		N/A
	d) external operating means, additional to the integral operating means;		N/A
	e) type designation and/or purely aesthetic features (e.g. labels);		P
	f) in the case of the 2-pole and 4-pole variants, replacement of the trip unit in one pole by a link, to provide an unprotected neutral;		N/A
	g) creating a 2-pole breaker from a 3-pole breaker by removing the center current path, or rendering the central pole inaccessible;		N/A
	h) difference in embedded software (firmware) in electronic trip units, which has no impact on the required performance, in particular the tripping function;		N/A
	i) electronic trip unit hardware, due to omitted components on identical printed circuit board layout (e.g. rotary knobs, display, etc.).		N/A
8.1.7	Additional requirements for equipment provided with a neutral pole		
8.1.9 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 8.1.8.4.).	N is marked for 4P	P
	A switched neutral pole shall break not before and shall make not after the other poles		P
	If a pole having an appropriate short-circuit breaking and making capacity (see 3.7.14 and 3.7.15) is used as a neutral pole, then all poles, including the neutral pole, may operate substantially together.		N/A
	For equipment having a value of conventional thermal current (free air or enclosed, see and 5.3.2.2) 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	Equal to In	N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.1.8	Digital inputs and outputs for use with programmable logic controllers (PLCs)		
	Annex S of IEC 60947-1:2020 applies. For the purposes of this document, this requirement does not apply to digital inputs and outputs dedicated to devices other than PLCs.		N/A
8.2	Performance requirements		
8.2.1	Operating condition		
8.2.1.1	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
8.2.1.1.2	Dependent manual closing		
	For a circuit-breaker having a dependent manual closing mechanism, it is not possible to assign a short-circuit making capacity rating irrespective of the conditions of mechanical operation		N/A
	Such a circuit-breaker should not be used in circuits having a prospective peak making current exceeding 10 kA		N/A
	However, this does not apply in the case of a circuit-breaker having a dependent manual closing mechanism and incorporating an integral fast-acting opening release which causes the circuit-breaker to break safely, irrespective of the speed and firmness with which it is closed on to prospective peak currents exceeding 10 kA; in this case, a rated short-circuit making capacity can be assigned		N/A
8.2.1.1.3	Independent manual closing		
	A circuit-breaker having an independent manual closing mechanism can be assigned a short-circuit making capacity rating irrespective of the conditions of mechanical operation		P
8.2.1.1.4	Dependent power closing		
	At 110% of the rated control circuit supply voltage, the closing operation performed on no-load shall not cause any damage to the circuit-breaker.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	At 85% of the rated control circuit supply voltage, the closing operation shall be performed to establish a current through the circuit-breaker 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
8.2.1.1.5	Independent power closing		
	A circuit-breaker having an independent power closing operation can be assigned a rated short-circuit making capacity irrespective of the conditions of power closing		N/A
	Means for charging the operating mechanism, as well as the closing control components, shall be capable of operating in accordance with the manufacturer's specification		N/A
8.2.1.1.6	Stored energy closing		
	Capable ensuring closing of the circuit-breaker in any condition between no-load and its rated making capacity		N/A
	- when the stored energy is retained within the circuit-breaker, a device is provided which indicates when the storing mechanism is fully charged.		N/A
	- means for charging the operating mechanism and closing control components operates when auxiliary supply voltage is between 85% and 110% of the rated control circuit supply voltage.		N/A
	- not possible for the moving contacts to move from the open position, unless the charge is sufficient for satisfactory completion of the closing operation.		N/A
	- by manually operated circuit-breaker is the direction of operation indicated. (not for circuit-breaker with an independent manual closing operation.)		N/A
	- For trip free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the release is in the position to trip the circuit-breaker.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.1.2	Opening		
8.2.1.2.1	Circuit-breakers which open automatically shall be trip-free and shall have their energy for the tripping operation stored prior to the completion of the closing operation		
8.2.1.2.2	Opening by undervoltage releases		
8.2.1.3. part 1	Limits of operation of under-voltage relays and releases		
8.2.1.3. a	Operating voltage		
	An under-voltage relay or release, when associated with a switching device, shall operate to open the equipment even on a slowly falling voltage within the range between 70% and 35% of its rated voltage		N/A
	An under-voltage relay or release shall prevent the closing of the equipment when the supply voltage is below 35% of the rated voltage of the relay or release; it shall permit closing of the equipment at supply voltages equal to or above 85% of its rated value		N/A
	Unless otherwise stated in the relevant product standard, the upper limit of the supply voltage shall be 110% of its rated value		N/A
8.2.1.3. 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
8.2.1.2.3	Opening by shunt releases		N/A
8.2.1.4 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 circuit supply voltage and, if alternating current., at the rated frequency		N/A
8.2.1.2.4	Opening by over-current releases		
a)	Opening under short-circuit conditions		
	The short-circuit release shall cause tripping of the circuit-breaker within a tolerance 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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (RMS symmetrical for AC currents)		N/A
	- I^2t characteristics for circuit-breakers of selectivity category A and, if applicable, B for circuit-breakers with instantaneous override (see note to 9.3.6.1)		N/A
b)	Opening under overload conditions		
1)	Instantaneous or definite time-delay operation		P
	The release shall cause tripping of the circuit-breaker within a tolerance of ±20%of the tripping current value of the current setting for all values of current setting of the overload release		P
2)	Inverse time-delay operation		
	At the reference temperature and at 1,05 times the current setting with the conventional non-tripping current, the overload 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
c)	Opening underground-fault conditions		
	The ground-fault overcurrent release shall cause tripping of the circuit-breaker within the tolerance corresponding to the type of detection function (CI-A or CI-B) according to T.4 of IEC 60947-1:2020, for all values of the current setting of the ground-fault overcurrent release.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Ground-fault overcurrent releases may have an intentional time-delay, but the break time shall not exceed the tripping time values indicated in Table T.1 of IEC 60947-1:2020.		N/A
8.2.2	Temperature-rise		
8.2.2.1	Temperature-rise limits		
	The temperature-rises of the several parts of a circuit-breaker, measured under the conditions specified in 9.3.3.5, shall not exceed the limiting values stated in Table 6 during the tests made in accordance with 9.3.4.7. The temperature-rises of the terminals shall not exceed the limiting values stated in Table 6 during the tests made in accordance with 9.3.5.5 and 9.3.7.4.		P
8.2.2.2	Ambient air temperature		
	The temperature-rise limits given in Table 6 are applicable only if the ambient air temperature remains within the limits given in 7.1.1 of IEC 60947-1:2020.		P
8.2.2.3	Main circuit		
	The main circuit of a circuit-breaker, including the overcurrent releases that may be associated with it, shall be capable of carrying its rated current *I*n, under the conditions of Clause 9, without the temperature-rises exceeding the limits specified in Table 6.		P
8.2.2.4	Control circuits		
	The control circuits, including control circuit devices, used for the closing and opening operations of a circuit-breaker, shall permit the rated duty, as specified in 5.3.5, and also the temperature-rise tests under the test conditions specified in 9.3.3.5, to be made without the temperature-rises exceeding the limits specified in Table 6.		N/A
	The requirements of this subclause shall be verified on a new circuit-breaker sample. Alternatively, at the discretion of the manufacturer, the verification may be made during the temperature-rise test of 9.3.4.7.		N/A
8.2.2.5	Auxiliary circuits		
	Auxiliary circuits, including auxiliary devices, shall be capable of carrying their conventional thermal current without the temperature-rises exceeding the limits specified in Table 6 when tested in accordance with 9.3.3.5.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.3	Dielectric properties		
8.2.3.1	General		
	Subclauses 8.2.3.1 a) and 8.2.3.1 b) of IEC 60947-1:2020 apply.		P
	Type tests shall be made in accordance with 9.3.4.3.		P
	The verification of dielectric withstand during all test sequences shall be made in accordance with 9.3.4.6.		P
8.2.3.2	Impulse withstand voltage		
	For circuit-breakers rated above 1 000 V AC, the impulse withstand voltage shall be agreed between the manufacturer and the user but shall not be less than the corresponding values for 1 000 V AC.		P
8.2.3.3	Power-frequency or DC withstand voltage of the main, auxiliary and control circuits		
	Power-frequency tests are used in the following cases:		P
	- dielectric tests as type tests for the verification of solid insulation;		P
	- dielectric withstand verification, as a criterion of failure, after switching or short-circuit type tests;		P
	- routine tests.		N/A
8.2.3.4	Clearances		
	Subclause 8.2.3.4 of IEC 60947-1: 2020 applies.		P
8.2.3.5	Creepage distance		
	Subclause 8.2.3.5 of IEC 60947-1:2020 applies.		P
8.2.3.6	Solid insulation		
	Solid insulation shall be verified by either power-frequency tests, in accordance with 9.3.3.4.1, item 3) of IEC 60947-1: 2020, or DC tests (test voltages for DC tests are under consideration).		P
	For the purposes of this document, circuits incorporating solid-state devices shall be disconnected for the tests.		N/A
8.2.3.7	Spacing between separate circuits		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For dimensioning clearances, creepage distances and solid insulation between separate circuits, the highest voltage ratings shall be used (rated impulse withstand voltage for clearances and associated solid insulation and rated insulation voltage or working voltage for creepage distances).		N/A
8.2.3.8	Requirements for circuits with protective separation		
	Annex N of IEC 60947-1:2020 applies.		N/A
N.4.1	Tests verification shall be made between the SELV (PELV) circuit and each other circuits, such as main circuit, control and auxiliary circuits.		N/A
	Tests shall be done in all operating conditions of the device: open, close, trip positions.		N/A
N.4.2	Dielectric tests		
N.4.2.1	Creepages verification		
	Conditions of measuring are those given in 9.3.3.4.1 and Annex G.		N/A
N.4.2.2	Clearances verification		
	Tests shall be made on devices mounted as for service, including internal wiring and in a clean and dry condition.		N/A
	For each circuit of the device under test, external terminals shall be connected together.		N/A
	It shall be an impulse test voltage having a 1,2/50 µs wave form as described in 9.3.3.4.1, the value of which being chosen as defined in N.3.2.2.		N/A
	Clearances are verified by application of the test voltage of N.4.2.2.3. The test shall be conducted for a minimum of five impulses of each polarity with an interval of at least 1 s between pulses in accordance with in 9.3.3.4.1.		N/A
	Application of test voltage may be avoided where clearances are equal or higher than those given in Table 13 for the determined test voltage value.		N/A
	When the voltage is applied, the test is considered to have been passed if there is no puncture or flashover.		N/A

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

9	**TESTS**		
9.2	**Compliance with constructional requirements**		
	Subclause 9.2 of IEC 60947-1:2020 applies.		
9.2.2 part 1	Test of resistance to abnormal heat and fire		
9.2.2.1	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 TABLE 9	P
	any parts of identical material having representative thickness		N/A
9.2.2.2	Flammability, hot wire ignition and arc ignition tests (on materials)		
	Suitable specimens of the material shall be subjected to the following tests:		N/A
	a) flammability test, in accordance with IEC 60695-11-10;		N/A
	b) hot wire ignition (HWI) test, as described in Annex M;		N/A
	c) arc ignition (AI) test, as described in Annex M.		N/A
	The test c) is required only if the material is located within the 13 mm of arcing parts or live parts which are subject to loosening of connections. Materials located within 13 mm of arcing parts are exempt from this test if the equipment is subjected to make/break testing.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.5 part 1	Mechanical and electrical properties of terminals		
9.2.5.1	General conditions for tests		
	Unless otherwise stated by the manufacturer, each test shall be made on terminals in a clean and new condition.		
	When tests are made with round copper conductors, these shall be of copper according to IEC 60228.		P
	When tests are made with flat copper conductors, these shall have the following characteristics:		P
	- minimum purity: 99,5 %;		P
	- ultimate tensile strength: 200 N/mm2 to 280 N/mm2;		P
	- Vickers hardness: 40 to 65.		P
9.2.5.2	Test of mechanical strength of terminals		
	Maximum cross-sectional area of conductor (mm²):	120 mm²	
	Diameter of thread (mm):	8 mm	
	For screw-type terminals, the tightening torque in accordance with Table 4 or 110 % of the torque specified by the manufacturer, whichever is the greater. (Nm):	6 Nm	
	5 times on 2 separate clamping units		P
	Where a screw has a hexagonal head with means for tightening with a screwdriver and the values in columns II and III are different, the test is made twice, first applying to the hexagonal head the torque specified in column III, and then, on another set of samples, applying the torque specified in column II by means of a screwdriver.		N/A
	If the values in columns II and III are the same, only the test with the screwdriver is made.		N/A
	Each time the clamping screw or nut is loosened, a new conductor shall be used for each tightening test.		P
	During the test, clamping units and terminals shall not work loose and there shall be no damage, such as breakage of screws or damage to the head slots, threads, washers or stirrups that will impair the further use of the screwed connections.		P
9.2.5.3	Testing for damage to and accidental loosening of conductor (flexion test)		
	Conductor of the minimum cross-sectional area (mm²):		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Number of conductors of the minimum 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
9.2.5.4.1	Pull-out test for round copper conductors		
	Force (N):		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
9.2.5.3	Testing for damage to and accidental loosening of conductor (flexion test)		
	Conductor of the maximum cross-sectional area (mm^2):		
	Number of conductors of the maximum 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
9.2.5.4.1	Pull-out test for round copper conductors		
	Force (N):		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
9.2.5.3	Testing for damage to and accidental loosening of conductor (flexion test)		
	Conductor of the maximum and minimum cross-sectional area (mm^2):		
	Number of conductors of the minimum cross section, number of conductors of the maximum cross section:		
	Diameter of bushing hole (mm):		
	Height between the equipment and the platen:		
	Mass at the conductor(s) (kg):		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
9.2.5.4.1	Pull-out test for round copper conductors		
	Force (N):		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		N/A
9.2.5.4.2	Pull-out test for flat copper conductors		
	A suitable length of conductor shall be secured in the terminal and the pulling force given in Table 6 applied without jerks for 1 min in a direction opposite to that of the insertion of the conductor.		N/A
	During the test, the conductor shall neither slip out of the terminal nor break near the clamping unit.		N/A
9.2.5.5	Test for insertability of unprepared round copper conductors having the maximum cross-section		
9.2.5.5.1	Test procedure		
	The test shall be carried out using the appropriate gauge form A or form B specified in Table 7.		
	The measuring section of the gauge shall be able to penetrate freely into the terminal aperture to the full depth of the terminal		N/A
	Alternatively, the test can be carried out by inserting the largest conductor of type and rated cross-section among those recommended by the manufacturer, the diameter of which corresponds to the theoretical diameter according to Table 8, after the insulation has been removed and the end has been reshaped. The stripped end of the conductor shall be able to enter completely within the clamping unit aperture, without use of undue force.		N/A
9.2.5.5.2	Construction of gauges		
	The construction of the gauges is shown in Figure 2.		N/A
	Details of dimensions a and b and their permissible deviations are shown in Table 7. The measuring section of the gauge shall be made from gauge steel.		N/A
9.2.5.7	Electrical performance of screwless-type clamping units		
	Subclauses 9.8 of IEC 60999-1:1999 and 9.8 of IEC 60999-2:2003 apply.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For the largest cross-sectional area the test current applied is I_{th} (or I_{the}) declared for the product.		N/A
	For the smallest cross-sectional area, the test current is given in Table 9.		N/A
	Alternatively, upon request of the manufacturer, the rated I_{th} (or I_{the}) may be applied.		N/A
	The detailed test requirements may be adapted, considering practical aspects, in the product standards.		N/A
9.2.5.8	Ageing test for screwless-type clamping units		
	Subclauses 9.10 of IEC 60999-1:1999 and 9.10 of IEC 60999-2:2003 apply.		N/A
	The detailed test requirements may be adapted, considering the practical aspects, in the product standards.		N/A
9.2.8	Conduit pull-out test, torque test and bending test with metallic conduits		
9.2.8.1	General		
	The test shall be made with an appropriate sized metal conduit (300 $\pm$ 10) mm long.		N/A
	The polymeric enclosure shall be installed according to the manufacturer's instructions, in the most unfavourable position.		N/A
	The tests shall be made on the same conduit entry, this being the most unfavourable entry		N/A
	The tests shall be made in the sequence 9.2.8.2, 9.2.8.3 and 9.2.8.4.		N/A
9.2.8.2	Pull-out test		
	Torque for screwing the conduit into the entry.....:		N/A
	Pull force (N) .....:		N/A
	5 min, the displacement of the conduit in relation with the entry shall be less than one thread depth		N/A
	There shall be no evidence of damage impairing further use of the enclosure		N/A
9.2.8.3	Bending test		
	A slowly increasing bending moment shall be applied without jerk to the free end of the conduit		N/A
	Bending moment is maintained at 1 min.....:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The test is then repeated in a perpendicular direction		N/A
9.2.8.4	There shall be no evidence of damage impairing further use of the enclosure		
	Torque (Nm) .....:		N/A
	It shall be possible to unscrew the conduit and there shall be no evidence of damage impairing further use of the enclosure		N/A
9.2.9	Test of earth continuity for protective earth		
9.2.9.1	General		
	All exposed conductive parts of the control or switching device and/or its enclosure shall be stated in the test report.		N/A
	For each of the exposed conductive parts the test shall be performed.		N/A
9.2.9.2	Earth continuity test		
	Test current ≥ 10 A (A).....:		N/A
	Cross section (mm^2).....:		N/A
	Resistance (Ω) .....:		N/A
9.2.9.3	Test results		
	The resistance calculated by the voltage drop and the measurement current shall not exceed 0,1 Ω.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.4	**TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS** GYCM8RT-250C, 250 A, 4P, reference temperature 55 °C, sample no. 1#		
9.3.4.2	Test of tripping limits and characteristic		
9.3.4.2.2	Short circuit releases		
	Sample no:	1#	
	Rated operational voltage: Ue (V)	380 Vac / 400 Vac / 415 Vac	
	Rated current: In (A)	250 A	
	Ambient temperature 10-40 °C:	24 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	Ii: (5, 10) x In	P
	Range of adjustable setting current. (A)	Ii: (5, 10) x In	P
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Electromagnetic over current releases		
	Test current: 80% of the rated, or **minimum** adjustable setting current: (A)	0,8 x 5 x In L1-L2: 1014 A L1-L3: 1034 A L2-L3: 1022 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	 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: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, or **minimum** adjustable setting current: (A)	1,2 x 5 x In L1-L2: 1462 A L1-L3: 1484 A L2-L3: 1458 A	P
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	 24 ms 29 ms 31 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: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the **maximum** adjustable setting current: (A)	0,8 x 10 x In L1-L2: 2105 A L1-L3: 2075 A L2-L3: 2120 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	 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: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the **maximum** adjustable setting current: (A)	1,2 x 10 x In L1-L2: 2905 A L1-L3: 2990 A L2-L3: 2860 A	P
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	 21 ms 24 ms 26 ms -	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: tripping current declared for single pole operation (A)	1,2 x 5 x In (Ii = 5 In) L1: 1474 A L2: 1462 A L3: 1490 A 1,2 x 10 x In (Ii = 10 In) L1: 2920 A L2: 2955 A L3: 2920 A	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < 0,2 s in case of instantaneous release: L1: L2: L3: N: L1: L2: L3: N:	Ii = 5 In 26 ms 24 ms 25 ms - Ii = 10 In 21 ms 22 ms 22 ms -	P
	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.		N/A
	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: L3: N:		N/A
	Or operating time: > non-tripping duration (max setting of time-delay, if any) stated by the manufacturer, in the case of short-time delay short-circuit releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or **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: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the **maximum** adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Or operating time: > non-tripping duration (max setting of time-delay, if any) stated by the manufacturer, in the case of short-time delay short-circuit releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the **maximum** adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.4.2.3	Overload releases		
a)	Instantaneous or definite time-delay releases		
	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
	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

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.		N/A
b)	Inverse time delay releases		
	Sample no:	1#	
	Rated operational voltage: Ue (V)	380 Vac / 400 Vac / 415 Vac	
	Rated current: In (A)	250 A	
	For releases dependent of ambient air temperature: Reference temperature	55 °C	P
	Test ambient temperature (°C)	55 °C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermal-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Test ambient air temperature:		N/A
	Range of adjustable setting current: (A)	Ir: (0,7, 1,0) x In	P
	Releases, dependent of ambient air temperature: Reference temperature (°C)	55 °C	P
	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)	183,8 A (1,05 x 0,7 x 250 A)	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2h non-tripping	P
	Test current: 130% of the rated, or **minimum** adjustable setting current: (A)	227,5 A (1,3 x 0,7 x 250 A)	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.		N/A
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	14 min 47 s	P
	Test current: 105% of the **maximum** adjustable setting current: (A)	262,5 A (1,05 x 1 x 250 A)	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2h non-tripping	P
	Test current: 130% of the **maximum** adjustable setting current: (A)	325 A (1,3 x 1 x 250 A)	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	19 min 24 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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A		N/A
	An additional test, at a current value equal to or greater than two times the current setting, shall be made to verify the time/current characteristic of the releases conform (within the stated tolerances) to the curves provided by the manufacturer.		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	55 °C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	55 °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)	350 A (2 x 0,7 x In) Ir: 0,7 In 500 A (2 x 1 x In) Ir: 1,0 In	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	4 min 29 s (Ir: 0,7 In) 5 min 19 s (Ir: 1,0 In) Tripping time specified by the manufacturer: 40 s ≤ t ≤ 1000 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A
9.3.4.2.4	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		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Ground-fault overcurrent releases: on one pole chosen at random		N/A
	Test current: 1,5 times of the rated, or **minimum** adjustable setting current: (A)		N/A
	Operating time, overload releases: (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electromagnetic): (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electronic): (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, ground-fault overcurrent releases: (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Test current: 1,5 times of the **maximum** adjustable setting current: (A)		N/A
	Operating time, overload releases: (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, short-circuit releases (electromagnetic): (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electronic): (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, ground-fault overcurrent releases: (s) L1: L2: L3:		v
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	Overload releases: (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	Short-circuit releases		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Ground-fault overcurrent releases: on one pole chosen at random		N/A
	Test current: 1,5 times of the **minimum** adjustable setting current: (A)		N/A
	Non-tripping duration stated by the manufacturer for overload release: (s)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	Non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Non-tripping duration stated by the manufacturer for ground-fault overcurrent release: (s)		N/A
	Time duration of current when reduced to the value corresponding to the overload current setting (I_r) for short-circuit or overload releases: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	The value corresponding to the overload current setting: (I_r)		N/A
	Time duration of current when reduced to 75% of the ground-fault current setting (I_g) for ground-fault overcurrent releases: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	The value of 75% of the ground-fault current setting: (I_g)		N/A
	Operating time, overload releases: the circuit-breaker does not trip:		N/A
	Operating time, short-circuit releases (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, short-circuit releases (electronic), shall not trip: (s) L1: L2: L3:		N/A
	Operating time, ground-fault overcurrent releases, shall not trip: (s) L1: L2: L3:		N/A
	Test current: 1,5 times of **maximum** adjustable setting current: (A)		N/A
	Non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	Non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	Non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Non-tripping duration stated by the manufacturer for ground-fault overcurrent release: (s)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time duration of current when reduced to the value corresponding to the overload current setting (I_r): shall be twice the delay-time stated by the manufacturer: (s)		N/A
	The value corresponding to the overload current setting: (I_r)		N/A
	Time duration of current when reduced to 75% of the ground-fault current setting (I_g) for ground-fault overcurrent releases: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	The value of 75% of the ground-fault current setting: (I_g)		N/A
	Operating time, overload releases: the circuit-breaker does not trip:		N/A
	Operating time, short-circuit releases (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, short-circuit releases (electronic), shall not trip: (s) L1: L2: L3:		N/A
	Operating time, ground-fault overcurrent releases, shall not trip: (s) L1: L2: L3:		N/A
9.3.4.2.5	Additional tests for ground-fault overcurrent releases		
	Annex T of IEC 60947-1:2020 applies, replacing "relay" by "release" when applicable, with the following additions.		N/A
	Definite time-delay releases shall comply with the requirements of 9.3.4.2.4.		N/A
	All tests shall be performed on one pole chosen at random		N/A
	For AC tests, the test current shall have no asymmetry. For DC tests, the current shall exhibit no overshoot at switch-on, and the time constant shall be less than 10 ms.		N/A
	If the circuit-breaker is provided with a ground-fault I^2t characteristic (see Figure K.1), this I^2t characteristic shall be disabled for the tests.		N/A
	Types of release: (CI-A or CI-B:)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Range of adjustable ground/earth fault setting current. (A)		N/A
	Time delay stated by the manufacturer		N/A
T.6.1 part 1	Limits of operation of ground/earth fault current sensing electronic releases Types (CI -A and -B)		
	Test current: 90% of the rated, or **minimum** adjustable setting current, in case of CI-A: (A)		N/A
	No trip: L1: L2: L3: N:		N/A
	Test current: 110% of the rated, or **minimum** adjustable setting current, in case of CI-A: (A)		N/A
	Operating time: 10 ms < Tp ≤ 1000 ms: L1: L2: L3: N:		N/A
	Test current: 90% of the **maximum** adjustable setting current, in case of CI-A: (A)		N/A
	No trip: L1: L2: L3: N:		N/A
	Test current: 110% of the **maximum** adjustable setting current, in case of CI-A: (A)		N/A
	Operating time: 10 ms < Tp ≤ 1000 ms: L1: L2: L3: N:		N/A
	Test current: 75% of the rated, or **minimum** adjustable setting current, in case of CI-B: (A)		N/A
	No trip: L1: L2: L3: N:		N/A
	Test current: 125% of the rated, or **minimum** adjustable setting current, in case of CI-B: (A)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: 10 ms < Tp ≤ 5000 ms: L1: L2: L3: N:		N/A
	Test current: 75% of the **maximum** adjustable setting current, in case of CI-B: (A)		N/A
	No trip: L1: L2: L3: N:		N/A
	Test current: 125% of the **maximum** adjustable setting current, in case of CI-B: (A)		N/A
	Operating time: 10 ms < Tp ≤ 5000 ms: L1: L2: L3: N:		N/A
9.3.4.3	Test of dielectric properties, impulse withstand voltage:		
9.3.3.4 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):	8 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV):	9,8 kV	P
	- test Uimp auxiliary circuits (kV):		N/A
	- test Uimp control circuits (kV):		N/A
	- test Uimp on open main contacts (kV):	12,3 kV	P
9.3.3.4.1 2) c)	Application of test voltage		
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation, including tripped position, if any		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, including tripped position, if any.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		P
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, power frequency or DC withstand voltage:		
	- rated insulation voltage (V):	1000 V	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)		N/A
9.3.3.4.1 2) c)	Application of test voltage		
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
(iii)	For circuit-breakers having an operational voltage greater than 50 V, the leakage current shall be measured through each pole with the contacts in the open position and the tipped position (if any), at a test voltage of 1,1 Ue, and shall not exceed 0,5 mA:	Open position: 457 Vac L1: < 0,35 mA L2: < 0,35 mA L3: < 0,35 mA N: < 0,35 mA Tripped position: 457 Vac L1: < 0,35 mA L2: < 0,35 mA L3: < 0,35 mA N: < 0,35 mA	P
(iv)	Circuit-breakers having a rated insulation voltage greater than 1 000 V AC. shall be tested at a voltage of Ui + 1 200 V AC RMS or 2 Ui whichever is the greater.		N/A
(v)	Withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		N/A
9.3.4.4	Mechanical operation and operational performance capability		
9.3.3.4.2	Construction and mechanical operation		
9.3.4.4.2.1	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 8.1.2		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 8.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		N/A
9.3.4.4.2.2	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 8.2.1.1.4		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 8.2.1.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control circuit supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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
9.3.4.4.2.3	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 8.2.1.3 of IEC 60947-1:2020. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated control circuit supply voltages this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control circuit supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 9.3.4.7		N/A
	In the case of a release with a range of rated control circuit supply voltage, this test is made at both the minimum and maximum rated control circuit supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control circuit supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	When the supply voltage is raised to 85% of the minimum control circuit supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control circuit supply voltage for 4 h without impairing its functions		N/A
9.3.4.4.2.4	Shunt releases		
	Shunt releases shall comply with the requirements of 8.2.1.4 of IEC 60947-1:2020. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control circuit supply voltage when tested at an ambient temperature of + 55 °C ± 2 °C without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control circuit supply voltages, the test voltage shall be 70% of the minimum rated control circuit supply voltage		N/A
9.3.4.4.3	Operational performance capability without current.		
	Type designation or serial number catalogue reference	GYCM8RT-250C	
	Sample no:	1#	
	Rated current In (A)	250 A	
	Rated operational voltage: Ue (V)	380 Vac / 400 Vac / 415 Vac	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt releases: Uc (V)	No shunt release	
	Rated control circuitsupply voltage undervoltage releases: Uc (V)	No undervoltage release	
	Ambient temperature 10-40 °C:	24 °C	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles without current (total) (closing releases energized at the rated Uc)	7000 cycles	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Number of cycles without current (without releases)	7000 cycles	P
	Applied voltage of closing releases (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the maximum rated control circuit supply voltage		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated control circuit supply voltage		N/A
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	In the case of circuit-breakers fitted with electrical or pneumatic closing releases, these devices shall be supplied at their rated control circuit supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in table 6.		P
9.3.4.4.4	Operational performance capability with current.		
	Rated current: In (A)	250 A	
	Maximum rated operational voltage: Ue (V)	415 Vac	
	Conductor cross-sectional area (mm^2):	120 mm^2	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles with current (total) (closing releases energized at the rated Uc)	1000 cycles	P
	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.	Ir = 1,0 In, Ii = 5 In	P
	Conditions, make/break operations:		P
	- test voltage U/Ue = 1,0 (V) ..... L1-L2: ..... L2-L3: L1-L3:	415 Vac 416 Vac 416 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test current I/In = 1,0 (A).....L1: .....L2: L3:	252 A 252 A 252 A	P
	- power factor/time constant:	0,83	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	Min: 924 ms	P
	- off-time (s):	29,1 s	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing releases, these devices shall be supplied at their rated control circuit supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in table 6.		N/A
9.3.4.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles: 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
9.3.4.5	Overload performance		
	This test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number catalogue reference	GYCM8RT-250C	
	Sample no:	1#	
	Rated current In (A)	250 A	
	Maximum rated operational voltage: Ue (V)	415 Vac	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt releases: Uc (V)	No shunt release	
	Rated control circuit supply voltage undervoltage releases: Uc (V)	No undervoltage release	
	Ambient temperature 10-40 °C:	24 °C	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles with current (total) (closing releases energized at the rated Uc)	15 cycles	P
	Applied voltage: closing releases (V)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.	Ir = 1,0 In, Ii = 10 In	P
	Conditions, overload operations:		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	437 Vac 437 Vac 437 Vac	P
	- test current AC/DC: I/In = 6,0/2.5 (A) .....L1: .....L2: L3:	 1,53 kA 1,55 kA 1,55 kA	P
	- power factor/time constant:	0,53	P
	- 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 suitable voltage	12 manual operations at 1,05 Ue 3 (automatic operations at convenient voltage)	P
	- frequency: (Hz)	50 Hz	P
	- on-time max 2s:	Manual operations: Min: 777 ms Max: 780 ms Automatic operations: Min: 17 s Max: 19 s	P
	The number of operating cycles per hour shall be that specified in column 2 of Table 7. If the circuit-breaker does not latch in at the specified rate, this rate may be reduced so that the circuit-breaker can be closed, the full current being established:	120 cycles per hour	P
	Operating rate if different from Table 7		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.4.6	Verification of dielectric withstand and leakage current		
	AC circuit-breaker: - equal to twice the rated operational voltage with a minimum of 1000 V RMS for 5 seconds, - or DC test voltage of 2 Ue × 1,415 with a minimum of 1 415 V DC, in case of AC test voltage cannot be applied to the AC circuit-breaker	1000 Vac, 5 s	P
	DC circuit-breaker: - equal to 2 U_e x 1,415 with a minimum of 1415 V DC for 5 seconds		N/A
	- no breakdown or flashover	See TABLE 5	P
	For dielectric tests involving the main circuit, the value of Ue referred to in this subclause is that at which the preceding switching and/or short-circuit tests have been conducted.		P
	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. The corresponding test voltage shall be applied for 5 s.	457 Vac L1: < 1,4 mA L2: < 1,4 mA L3: < 1,4 mA N: < 1,4 mA	P
9.3.4.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in table 6.	See TABLE 1	P
	Temperature rise of main circuit terminals ≤ 80 K (K):	Max: 75 K	P
	Conductor cross-sectional area (mm^2):	120 mm^2	P
	Test current In (A):	250 A	P
9.3.4.8	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 x 1 x 250 A)	P
	Conventional tripping time: <1h when In ≤ 63A, <2h when In > 63 A	16 min 02 s	P
9.3.4.9	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control circuit supply voltage		N/A
	and shall operate at 35% of the maximum control circuit supply voltage.		N/A

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 circuit supply voltage. Test made at room temperature.		N/A
9.3.4.10	Verification of the main contact position		P
	Following the verification of 9.3.4.8, a test shall be made to verify the effectiveness of the indication of the main contact position in accordance with 9.2.6 of IEC 60947-1: 2020. For the first criterion of 9.2.6.3.1of IEC 60947-1:2020 (actuator being left free), Figure 2 applies for the application of the test force (see 9.2.6.2.1 of IEC 60947-1:2020).		
9.2.6	Verification of the effectiveness of indication of the main contact position of equipment suitable for isolation		P
9.2.6.1	Effectiveness of contact position indication		
	To verify the effectiveness of the indication of the main contact position as required by 8.1.7, all means of indication of contact position shall continue to function correctly after the operational performance type tests, and special durability tests if performed.		P
9.2.6.2	Method of test		
9.2.6.2.1	Dependent and independent manual operation		
	Actuating force for opening (N) ..... :	77,7 N	P
	Means to keep the contact(s) closed and the number of contacts…… ..... …:	The contacts of N pole fixed together	P
	Test force for 10 s (N) ..... :	233 N for 10 s	P
	After the test, when the test force is no longer applied, the actuator being left free, the open position shall not be indicated by any of the means provided		P
	The equipment shall not show any damage such as to impair its normal operation		P
	When the equipment is provided with a means of locking in the open position, it shall not be possible to lock the equipment while the test force is applied		N/A
9.2.6.2.2	Dependent power operation		
	Means to keep the contact(s) closed and the number of contacts…… ..... …:		N/A
	Supply voltage of 110% of rated voltage (V)…….:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation		N/A
	When the equipment is provided with means for locking in the open position, it shall not be possible to lock the equipment during the test		N/A
9.2.6.2.3	Independent power operation		
	Means to keep the contact(s) closed and the number of contacts…… ..... …:		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts .....:		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		N/A
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation		N/A
	When the equipment is provided with means for locking in the open position, it shall not be possible to lock the equipment during the test		N/A
9.2.6.3	Condition of equipment during and after test		
9.2.6.3.1	Dependent and independent manual operation		
	After the test, when the test force is no longer applied, the actuator being left free, the open position shall not be indicated by any of the means provided and the equipment, by visual inspection, shall not show any external damage likely to impair its normal operation.		P
	“The open position shall not be indicated” means that no part or colouring for indication of the open position (as checked through 8.1.6 on a sample in new condition) shall be visible.		P
	For devices where the position is only indicated by the alignment of the actuator with markings on the cover, there shall clearly be no concurrence with the marking for the open position.		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	When the equipment is provided with a means of locking in the open position, it shall not be possible to lock the equipment while the test force is applied.		N/A
9.2.6.3.2	Dependent and independent power operation		
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation.		N/A
	When the equipment is provided with means for locking in the open position, it shall not be possible to lock the equipment during the test.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.4	**TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS** GYCM8RT-250C, 250 A, 3P, reference temperature 40 °C, sample no. 2#		
9.3.4.2	Test of tripping limits and characteristic		
9.3.4.2.2	Short circuit releases		
	Sample no:	2#	
	Rated operational voltage: Ue (V)	380 Vac / 400 Vac / 415 Vac	
	Rated current: In (A)	250 A	
	Ambient temperature 10-40 °C:	24 °C	P
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.	Ii: (5, 10) x In	P
	Range of adjustable setting current. (A)	Ii: (5, 10) x In	P
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Electromagnetic over current releases		
	Test current: 80% of the rated, or **minimum** adjustable setting current: (A)	0,8 x 5 x In L1-L2: 1018 A L1-L3: 1036 A L2-L3: 1024 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	 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: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the rated, or **minimum** adjustable setting current: (A)	1,2 x 5 x In L1-L2: 1458 A L1-L3: 1482 A L2-L3: 1466 A	P
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	 22 ms 20 ms 29 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: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 80% of the **maximum** adjustable setting current: (A)	0,8 x 10 x In L1-L2: 2085 A L1-L3: 2110 A L2-L3: 2095 A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	 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: L1-L3: L2-L3: N-Lx:		N/A
	Test current: 120% of the **maximum** adjustable setting current: (A)	1,2 x 10 x In L1-L2: 2935 A L1-L3: 2955 A L2-L3: 2860 A	P
	Operating time: <0,2s in case of instantaneous releases: L1-L2: L1-L3: L2-L3: N-Lx:	 26 ms 22 ms 22 ms -	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: L1-L3: L2-L3: N-Lx:		N/A
	Test current: tripping current declared for single pole operation (A)	1,2 x 5 x In (Ii = 5 In) L1: 1454 A L2: 1464 A L3: 1484 A 1,2 x 10 x In (Ii = 10 In) L1: 2920 A L2: 2975 A L3: 2905 A	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < 0,2 s in case of instantaneous release: L1: L2: L3: N: L1: L2: L3: N:	Ii = 5 In 21 ms 24 ms 24 ms - Ii = 10 In 21 ms 24 ms 24 ms -	P
	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.		N/A
	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: L3: N:		N/A
	Or operating time: > non-tripping duration (max setting of time-delay, if any) stated by the manufacturer, in the case of short-time delay short-circuit releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the rated, or **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: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 80% of the **maximum** adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Or operating time: > non-tripping duration (max setting of time-delay, if any) stated by the manufacturer, in the case of short-time delay short-circuit releases: L1: L2: L3: N:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A
	Test current: 120% of the **maximum** adjustable setting current: (A)		N/A
	Operating time: <0,2s in case of instantaneous releases: L1: L2: L3: N:		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1: L2: L3: N:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.4.2.3	Overload releases		
a)	Instantaneous or definite time-delay releases		
	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
	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

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.		N/A
b)	Inverse time delay releases		
	Sample no:	2#	
	Rated operational voltage: Ue (V)	380 Vac / 400 Vac / 415 Vac	
	Rated current: In (A)	250 A	
	For releases dependent of ambient air temperature: Reference temperature	40 °C	P
	Test ambient temperature (°C)	40 °C	P
	For releases dependent on ambient air temperature, the operating characteristics shall be verified at the reference temperature, the release being energized on all phase poles. If the test made at a different ambient temperature, a correction shall be made in accordance with the manufacturer's correction temperature/current data		P
	For thermal-magnetic releases independent of ambient temperature: Tests shall be made at 30°C and 20°C or 40°C, the release being energized on all phase poles		N/A
	For electronic releases, the operating characteristic shall be verified at the ambient temperature of the test room (see 6.1.1 of IEC 60947-1), the release being energised on all phase poles.		N/A
	Test ambient air temperature:		N/A
	Range of adjustable setting current: (A)	Ir: (0,7 - 1,0) x In	P
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	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)	183,8 A (1,05 x 0,7 x 250 A)	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2h non-tripping	P
	Test current: 130% of the rated, or **minimum** adjustable setting current: (A)	227,5 A (1,3 x 0,7 x 250 A)	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.		N/A
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A	17 min 27 s	P
	Test current: 105% of the **maximum** adjustable setting current: (A)	262,5 A (1,05 x 1 x 250 A)	P
	Conventional non-tripping time: 1h when In < 63A, 2h when In > 63 A	2h non-tripping	P
	Test current: 130% of the **maximum** adjustable setting current: (A)	325 A (1,3 x 1 x 250 A)	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	15 min 56 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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conventional tripping time: <1h when In < 63A, <2h when In > 63 A		N/A
	An additional test, at a current value equal to or greater than two times the current setting, shall be made to verify the time/current characteristic of the releases conform (within the stated tolerances) to the curves provided by the manufacturer.		
	Releases, dependent of ambient air temperature: Reference temperature (°C)	40 °C	P
	Releases, independent of ambient air temperature: at 30°C		N/A
	Test ambient air temperature:	40 °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)	350 A (2 x 0,7 x In) Ir: 0,7 In 500 A (2 x 1 x In) Ir: 1,0 In	P
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)	5 min 22 s (Ir: 0,7 In) 4 min 47 s (Ir: 1,0 In) Tripping time specified by the manufacturer: 40 s ≤ t ≤ 1000 s	P
	Releases, independent of ambient air temperature: at 20°C or 40°C		
	Test ambient air temperature:		N/A
	Test current: at current specified by the manufacturer to verify the time/current characteristic of the releases conform to the curves provided by the manufacturer. % at the rated, or minimum adjustable setting current: (% or A)		N/A
	Tripping time acc. time/current characteristic of the releases conform to the curves provided by the manufacturer. (within the stated tolerances)		N/A
9.3.4.2.4	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		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Ground-fault overcurrent releases: on one pole chosen at random		N/A
	Test current: 1,5 times of the rated, or **minimum** adjustable setting current: (A)		N/A
	Operating time, overload releases: (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electromagnetic): (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electronic): (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, ground-fault overcurrent releases: (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Test current: 1,5 times of the **maximum** adjustable setting current: (A)		N/A
	Operating time, overload releases: (s)		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time, short-circuit releases (electromagnetic): (s) L1-L2: L1-L3: L2-L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, short-circuit releases (electronic): (s) L1: L2: L3:		N/A
	Time-delay: between the limits stated by the manufacturer:		N/A
	Operating time, ground-fault overcurrent releases: (s) L1: L2: L3:		v
	Time-delay: between the limits stated by the manufacturer:		N/A
b)	Non-tripping duration		
	Firstly, the test current equal to 1,5 times the current setting is maintained for a time interval equal to the non-tripping duration stated by the manufacturer.		
	Then, the current is reduced to the rated current and maintained at this value for twice the time-delay stated by the manufacturer. The circuit-breaker shall not trip.		
	Overload releases: (all phase poles loaded)		N/A
	for circuit-breakers having an identified neutral pole provided with an overload release, the test current for this release shall be 1,5 times the current setting;		N/A
	Short-circuit releases		N/A
	Electromagnetic release: two poles in series carrying the test current, using successively all possible combinations of poles having a short-circuit release.		N/A
	Electronic releases: on one pole chosen at random.		N/A
	Ground-fault overcurrent releases: on one pole chosen at random		N/A
	Test current: 1,5 times of the **minimum** adjustable setting current: (A)		N/A
	Non-tripping duration stated by the manufacturer for overload release: (s)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	Non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Non-tripping duration stated by the manufacturer for ground-fault overcurrent release: (s)		N/A
	Time duration of current when reduced to the value corresponding to the overload current setting (I_r) for short-circuit or overload releases: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	The value corresponding to the overload current setting: (I_r)		N/A
	Time duration of current when reduced to 75% of the ground-fault current setting (I_g) for ground-fault overcurrent releases: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	The value of 75% of the ground-fault current setting: (I_g)		N/A
	Operating time, overload releases: the circuit-breaker does not trip:		N/A
	Operating time, short-circuit releases (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, short-circuit releases (electronic), shall not trip: (s) L1: L2: L3:		N/A
	Operating time, ground-fault overcurrent releases, shall not trip: (s) L1: L2: L3:		N/A
	Test current: 1,5 times of **maximum** adjustable setting current: (A)		N/A
	Non-tripping duration stated by the manufacturer for overload release: (s)		N/A
	Non-tripping duration stated by the manufacturer for short-circuit release thermal magnetic: (s)		N/A
	Non-tripping duration stated by the manufacturer for short-circuit release electronic: (s)		N/A
	Non-tripping duration stated by the manufacturer for ground-fault overcurrent release: (s)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Time duration of current when reduced to the value corresponding to the overload current setting (I_r): shall be twice the delay-time stated by the manufacturer: (s)		N/A
	The value corresponding to the overload current setting: (I_r)		N/A
	Time duration of current when reduced to 75% of the ground-fault current setting (I_g) for ground-fault overcurrent releases: shall be twice the delay-time stated by the manufacturer: (s)		N/A
	The value of 75% of the ground-fault current setting: (I_g)		N/A
	Operating time, overload releases: the circuit-breaker does not trip:		N/A
	Operating time, short-circuit releases (electromagnetic), shall not trip: (s) L1-L2: L1-L3: L2-L3:		N/A
	Operating time, short-circuit releases (electronic), shall not trip: (s) L1: L2: L3:		N/A
	Operating time, ground-fault overcurrent releases, shall not trip: (s) L1: L2: L3:		N/A
9.3.4.2.5	Additional tests for ground-fault overcurrent releases		
	Annex T of IEC 60947-1:2020 applies, replacing "relay" by "release" when applicable, with the following additions.		N/A
	Definite time-delay releases shall comply with the requirements of 9.3.4.2.4.		N/A
	All tests shall be performed on one pole chosen at random		N/A
	For AC tests, the test current shall have no asymmetry. For DC tests, the current shall exhibit no overshoot at switch-on, and the time constant shall be less than 10 ms.		N/A
	If the circuit-breaker is provided with a ground-fault I^2t characteristic (see Figure K.1), this I^2t characteristic shall be disabled for the tests.		N/A
	Types of release: (CI-A or CI-B:)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Range of adjustable ground/earth fault setting current. (A)		N/A
	Time delay stated by the manufacturer		N/A
T.6.1 part 1	Limits of operation of ground/earth fault current sensing electronic releases Types (CI -A and -B)		
	Test current: 90% of the rated, or **minimum** adjustable setting current, in case of CI-A: (A)		N/A
	No trip: L1: L2: L3: N:		N/A
	Test current: 110% of the rated, or **minimum** adjustable setting current, in case of CI-A: (A)		N/A
	Operating time: 10 ms < Tp ≤ 1000 ms: L1: L2: L3: N:		N/A
	Test current: 90% of the **maximum** adjustable setting current, in case of CI-A: (A)		N/A
	No trip: L1: L2: L3: N:		N/A
	Test current: 110% of the **maximum** adjustable setting current, in case of CI-A: (A)		N/A
	Operating time: 10 ms < Tp ≤ 1000 ms: L1: L2: L3: N:		N/A
	Test current: 75% of the rated, or **minimum** adjustable setting current, in case of CI-B: (A)		N/A
	No trip: L1: L2: L3: N:		N/A
	Test current: 125% of the rated, or **minimum** adjustable setting current, in case of CI-B: (A)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: 10 ms < Tp ≤ 5000 ms: L1: L2: L3: N:		N/A
	Test current: 75% of the **maximum** adjustable setting current, in case of CI-B: (A)		N/A
	No trip: L1: L2: L3: N:		N/A
	Test current: 125% of the **maximum** adjustable setting current, in case of CI-B: (A)		N/A
	Operating time: 10 ms < Tp ≤ 5000 ms: L1: L2: L3: N:		N/A
9.3.4.3	Test of dielectric properties, impulse withstand voltage:		
9.3.3.4 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):	8 kV	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV):	9,8 kV	P
	- test Uimp auxiliary circuits (kV):		N/A
	- test Uimp control circuits (kV):		N/A
	- test Uimp on open main contacts (kV):	12,3 kV	P
9.3.3.4.1 2) c)	Application of test voltage		
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation, including tripped position, if any		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, including tripped position, if any.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) across the poles of the main circuit, the line terminals being connected together and the load terminals connected together		P
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, power frequency or DC withstand voltage:		
	- rated insulation voltage (V):	1000 V	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)		N/A
9.3.3.4.1 2) c)	Application of test voltage		
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		N/A
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
(iii)	For circuit-breakers having an operational voltage greater than 50 V, the leakage current shall be measured through each pole with the contacts in the open position and the tipped position (if any), at a test voltage of 1,1 Ue, and shall not exceed 0,5 mA:	Open position: 457 Vac L1: < 0,35 mA L2: < 0,35 mA L3: < 0,35 mA Tripped position: 457 Vac L1: < 0,35 mA L2: < 0,35 mA L3: < 0,35 mA	P
(iv)	Circuit-breakers having a rated insulation voltage greater than 1 000 V AC. shall be tested at a voltage of Ui + 1 200 V AC RMS or 2 Ui whichever is the greater.		N/A
(v)	Withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		N/A
9.3.4.4	Mechanical operation and operational performance capability		
9.3.3.4.2	Construction and mechanical operation		
9.3.4.4.2.1	Construction		
	A withdrawable circuit-breaker shall be checked for the requirements stated in 8.1.2		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 8.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		N/A
9.3.4.4.2.2	Mechanical operation		
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 8.2.1.1.4		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 8.2.1.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control circuit supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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
9.3.4.4.2.3	Undervoltage releases		
	Undervoltage releases shall comply with the requirements of 8.2.1.3 of IEC 60947-1:2020. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		N/A
i)	Drop out voltage		
	It shall be verified that the release operates to open the circuit-breaker between the voltage limits specified		N/A
	The voltage shall be reduced from rated voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without current in the main circuit and without previous heating of the release coil		N/A
	In the case of a release with a range of rated control circuit supply voltages this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control circuit supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 9.3.4.7		N/A
	In the case of a release with a range of rated control circuit supply voltage, this test is made at both the minimum and maximum rated control circuit supply voltages		N/A
ii)	Test for limits of operation		
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control circuit supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	When the supply voltage is raised to 85% of the minimum control circuit supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control circuit supply voltage for 4 h without impairing its functions		N/A
9.3.4.4.2.4	Shunt releases		
	Shunt releases shall comply with the requirements of 8.2.1.4 of IEC 60947-1:2020. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control circuit supply voltage when tested at an ambient temperature of + 55 °C ± 2 °C without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control circuit supply voltages, the test voltage shall be 70% of the minimum rated control circuit supply voltage		N/A
9.3.4.4.3	Operational performance capability without current.		
	Type designation or serial number catalogue reference	GYCM8RT-250C	
	Sample no:	2#	
	Rated current In (A)	250 A	
	Rated operational voltage: Ue (V)	380 Vac / 400 Vac / 415 Vac	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt releases: Uc (V)	No shunt release	
	Rated control circuit supply voltage undervoltage releases: Uc (V)	No undervoltage release	
	Ambient temperature 10-40 °C:	24 °C	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles without current (total) (closing releases energized at the rated Uc)	7000 cycles	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Number of cycles without current (without releases)	7000 cycles	P
	Applied voltage of closing releases (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the maximum rated control circuit supply voltage		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated control circuit supply voltage		N/A
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	In the case of circuit-breakers fitted with electrical or pneumatic closing releases, these devices shall be supplied at their rated control circuit supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in table 6.		P
9.3.4.4.4	Operational performance capability with current.		
	Rated current: In (A)	250 A	
	Maximum rated operational voltage: Ue (V)	415 Vac	
	Conductor cross-sectional area (mm^2):	120 mm^2	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles with current (total) (closing releases energized at the rated Uc)	1000 cycles	P
	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.	Ir = 1,0 In, Ii = 5 In	P
	Conditions, make/break operations:		P
	- test voltage U/Ue = 1,0 (V) ..... L1-L2: ..... L2-L3: L1-L3:	415 Vac 416 Vac 416 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- test current I/In = 1,0 (A).....L1: .....L2: L3:	252 A 252 A 252 A	P
	- power factor/time constant:	0,83	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	Min: 925 ms	P
	- off-time (s):	29,1 s	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing releases, these devices shall be supplied at their rated control circuit supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in table 6.		N/A
9.3.4.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		
	Number of operations cycles: 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
9.3.4.5	Overload performance		
	This test applies to circuit-breaker of rated current up to and including 630 A		
	Type designation or serial number catalogue reference	GYCM8RT-250C	
	Sample no:	2#	
	Rated current In (A)	250 A	
	Maximum rated operational voltage: Ue (V)	415 Vac	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt releases: Uc (V)	No shunt release	
	Rated control circuit supply voltage undervoltage releases: Uc (V)	No undervoltage release	
	Ambient temperature 10-40 °C:	24 °C	P
	Number of operating cycles per hour	120 cycles per hour	P
	Number of cycles with current (total) (closing releases energized at the rated Uc)	15 cycles	P
	Applied voltage: closing releases (V)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload/short-circuit settings at maximum.	Ir = 1,0 In, Ii = 10 In	P
	Conditions, overload operations:		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	437 Vac 437 Vac 437 Vac	P
	- test current AC/DC: I/In = 6,0/2.5 (A) .....L1: .....L2: L3:	 1,53 kA 1,55 kA 1,55 kA	P
	- power factor/time constant:	0,53	P
	- 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 suitable voltage	12 manual operations at 1,05 Ue 3 (automatic operations at convenient voltage)	P
	- frequency: (Hz)	50 Hz	P
	- on-time max 2s:	Manual operations: Min: 778 ms Max: 787 ms Automatic operations: Min: 14 s Max: 17 s	P
	The number of operating cycles per hour shall be that specified in column 2 of Table 7. If the circuit-breaker does not latch in at the specified rate, this rate may be reduced so that the circuit-breaker can be closed, the full current being established:	120 cycles per hour	P
	Operating rate if different from Table 7		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.4.6	Verification of dielectric withstand and leakage current		
	AC circuit-breaker: - equal to twice the rated operational voltage with a minimum of 1000 V RMS for 5 seconds, - or DC test voltage of 2 Ue × 1,415 with a minimum of 1 415 V DC, in case of AC test voltage cannot be applied to the AC circuit-breaker	1000 Vac, 5 s	P
	DC circuit-breaker: - equal to 2 U_e x 1,415 with a minimum of 1415 V DC for 5 seconds		N/A
	- no breakdown or flashover	See TABLE 5	P
	For dielectric tests involving the main circuit, the value of Ue referred to in this subclause is that at which the preceding switching and/or short-circuit tests have been conducted.		P
	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. The corresponding test voltage shall be applied for 5 s.	457 Vac L1: < 1,4 mA L2: < 1,4 mA L3: < 1,4 mA	P
9.3.4.7	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in table 6.	See TABLE 2	P
	Temperature rise of main circuit terminals ≤ 80 K (K):	Max: 73 K	P
	Conductor cross-sectional area (mm²):	120 mm^2	P
	Test current In (A):	250 A	P
9.3.4.8	Verification of overload releases		
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 x 1 x 250 A)	P
	Conventional tripping time: <1h when In ≤ 63A, <2h when In > 63 A	3 min 31 s	P
9.3.4.9	Verification of undervoltage and shunt releases		
	Circuit-breaker fitted with undervoltage releases. The release shall not operate at 70% of the minimum control circuit supply voltage		N/A
	and shall operate at 35% of the maximum control circuit supply voltage.		N/A
	Circuit-breaker fitted with shunt releases. The release shall operate at 70% of the minimum rated control circuit supply voltage. Test made at room temperature.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.4.10	Verification of the main contact position		P
	Following the verification of 9.3.4.8, a test shall be made to verify the effectiveness of the indication of the main contact position in accordance with 9.2.6 of IEC 60947-1: 2020. For the first criterion of 9.2.6.3.1of IEC 60947-1:2020 (actuator being left free), Figure 2 applies for the application of the test force (see 9.2.6.2.1 of IEC 60947-1:2020).		
9.2.6	Verification of the effectiveness of indication of the main contact position of equipment suitable for isolation		P
9.2.6.1	Effectiveness of contact position indication		
	To verify the effectiveness of the indication of the main contact position as required by 8.1.7, all means of indication of contact position shall continue to function correctly after the operational performance type tests, and special durability tests if performed.		P
9.2.6.2	Method of test		
9.2.6.2.1	Dependent and independent manual operation		
	Actuating force for opening (N) .....:	77,6 N	P
	Means to keep the contact(s) closed and the number of contacts…… ..... …:	The contacts of L3 pole fixed together	P
	Test force for 10 s (N) .....:	233 N for 10 s	P
	After the test, when the test force is no longer applied, the actuator being left free, the open position shall not be indicated by any of the means provided		P
	The equipment shall not show any damage such as to impair its normal operation		P
	When the equipment is provided with a means of locking in the open position, it shall not be possible to lock the equipment while the test force is applied		N/A
9.2.6.2.2	Dependent power operation		
	Means to keep the contact(s) closed and the number of contacts…… ..... …:		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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation		N/A
	When the equipment is provided with means for locking in the open position, it shall not be possible to lock the equipment during the test		N/A
9.2.6.2.3	Independent power operation		
	Means to keep the contact(s) closed and the number of contacts…… ..... …:		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts .....:		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		N/A
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation		N/A
	When the equipment is provided with means for locking in the open position, it shall not be possible to lock the equipment during the test		N/A
9.2.6.3	Condition of equipment during and after test		
9.2.6.3.1	Dependent and independent manual operation		
	After the test, when the test force is no longer applied, the actuator being left free, the open position shall not be indicated by any of the means provided and the equipment, by visual inspection, shall not show any external damage likely to impair its normal operation.		P
	“The open position shall not be indicated” means that no part or colouring for indication of the open position (as checked through 8.1.6 on a sample in new condition) shall be visible.		P
	For devices where the position is only indicated by the alignment of the actuator with markings on the cover, there shall clearly be no concurrence with the marking for the open position.		P
	When the equipment is provided with a means of locking in the open position, it shall not be possible to lock the equipment while the test force is applied.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.6.3.2	Dependent and independent power operation		
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation.		N/A
	When the equipment is provided with means for locking in the open position, it shall not be possible to lock the equipment during the test.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.5	**TEST SEQUENCE II (Ics): Rated service short-circuit breaking capacity**		N/A

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

9.3.5	**TEST SEQUENCE II/III (Ics=Icu):** GYCM8RT-250C, 250 A, 4P, reference temperature 55 °C, sample no. 3#		
9.3.5.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or catalogue reference	GYCM8RT-250C	
	Sample no:	3#	
	Rated current: In (A)	250 A	
	Corresponding rated voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	50 kA	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt release: Uc (V)	No shunt release	
	Rated control circuit supply voltage of undervoltage releases: Uc (V)	No undervoltage release	
	For circuit-breaker fitted with adjustable overcurrent releases, test shall be made with the current and time settings at maximum.	Ir = 1,0 In, Ii = 10 In	P
	For circuit-breakers without overcurrent releases but fitted with a shunt release, this release shall be energized by the application of a voltage equal to 70 % of the rated control circuit supply voltage of the release (see 8.2.1.2.3), at a time not earlier than that of the initiation of the short-circuit nor later than 10 ms after the initiation of the short-circuit:		N/A
	A circuit-breaker having a dependent power operation shall be closed during tests with the control supply (voltage or pressure) at 85 % of its rated value:		N/A
	A circuit-breaker having an independent power operation shall be closed during tests with the operating mechanism charged to its maximum value stated by the manufacturer.		N/A
	A circuit-breaker having a stored energy operation shall be closed during tests with the operating means charged at 85 % of the rated voltage of the auxiliary supply:		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Distances of the metallic screen's: (all sides)	Up / Down: 80 mm Left / Right: 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 (mm^2):	120 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	6 Nm	P
9.3.6.2	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	This test is omitted for electronic trip units.		
	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.		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	 500 A 500 A 500 A	P
	Time specified by the manufacturer:	40 s ≤ t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	215 s 167 s 160 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.2 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A)..... L1-L2: ..... L2-L3: ..... L1-L3: .....N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: .....N-Lx:		N/A
9.3.5.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	439 Vac 439 Vac 439 Vac	P
	- RMS test current AC/DC: (kA).....L1: .....L2: L3:	50,5 kA 50,4 kA 50,1 kA	P
	Power factor/time constant:	0,22	P
	- Factor “n”	2,1	P
	- peak test current (kA): .....L1: .....L2: L3:	107 kA 87,7 kA 91,8 kA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence “O”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	21,8 kA 28,9 kA 16,4 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	1,28 MA^2s 2,38 MA^2s 424 kA^2s	P
	Pause, t: (min)	3 min 09 s	P
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	23,0 kA 28,0 kA 9,80 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	1,36 MA^2s 1,98 MA^2s 133 kA^2s	P
	Pause, t: (min)	3 min 02 s	P
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	10,4 kA 22,5 kA 28,7 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	162 kA^2s 1,38 MA^2s 2,11 MA^2s	P
	Melting of the fusible element	No melting of the fusible element	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence “O”	No holes	P
	Cracks observed	No cracks observed	P
9.3.5.3	Operational performance capability with current.		
	Rated current: In (A)	250 A	
	Maximum rated operational voltage: Ue (V)	415 Vac	
	Conductor cross-sectional area (mm^2):	120 mm^2	
	Number of operating cycles per hour	120 cycles per hour	P
	Number (5% of the number given in column 4, table 7) of cycles with current (total) (closing releases energized at the rated Uc)	50 cycles	P
	Applied voltage: closing releases (V)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 In, Ii = 5 In	P
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,0 (V) ..... L1-L2: ..... L2-L3: L1-L3:	417 Vac 417 Vac 417 Vac	P
	- test current I/In = 1,0 (A).....L1: .....L2: L3:	252 A 257 A 259 A	P
	- power factor/time constant:	0,81	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	Min: 825 ms	P
	- off-time (s):	Max: 29,2 s	P
	This verification need not be made where, for a given frame size, the test of 9.3.5.2 has been made on a circuit-breaker of minimum I_n or at the minimum overload release setting as specified in Table 15.		N/A
9.3.5.4	Verification of dielectric withstand and leakage current		
	AC circuit-breaker: - equal to twice the rated operational voltage with a minimum of 1000 V RMS for 5 seconds, - or DC test voltage of 2 *U*e × 1,415 with a minimum of 1 415 V DC, in case of AC test voltage cannot be applied to the AC circuit-breaker	1000 Vac, 5 s	P
	DC circuit-breaker: - equal to 2 *U*e x 1,415 with a minimum of 1415 V DC for 5 seconds		N/A
	- no breakdown or flashover	See TABLE 6	P
	The leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 *U*e, and shall not exceed 2 mA. The corresponding test voltage shall be applied for 5 s	457 Vac L1: < 1,4 mA L2: < 1,4 mA L3: < 1,4 mA N: < 1,4 mA	P
9.3.5.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 6.	See TABLE 3	P
	Temperature rise of main circuit terminals. ≤ 80 K (K):	Max: 59 K	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm²):	120 mm²	P
	Test current In (A):	250 A	P
	This verification need not be made where, for a given frame size, the test of 9.3.5.2 has been made on a circuit-breaker of minimum I_n or at the minimum overload release setting as specified in Table 15.		N/A
9.3.5.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 x 1 x 250 A)	P
	Conventional tripping time: <1h when In ≤ 63A, <2h when In > 63 A	1 min 37 s	P
9.3.6.5	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.		
	For electromagnetic overcurrent releases the operating time shall not exceed the max. value stated by the manufacturer for twice the value of the current setting of a single pole at the reference temperature.		
	For electronic overcurrent releases the operating time shall comply with the tolerance band stated by the manufacturer for 2,5 times the value of the current setting of a single pole.		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	 625 A 625 A 625 A	P
	Time specified by the manufacturer:	t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	58 s 1 min 12 s 56 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.5 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A

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

9.3.5	**TEST SEQUENCE II/III (Ics=Icu):** GYCM8RT-250C, 250 A, 4P, reference temperature 40 °C, sample no. 4#		
9.3.5.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or catalogue reference	GYCM8RT-250C	
	Sample no:	4#	
	Rated current: In (A)	250 A	
	Corresponding rated voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	50 kA	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt release: Uc (V)	No shunt release	
	Rated control circuit supply voltage of undervoltage releases: Uc (V)	No undervoltage release	
	For circuit-breaker fitted with adjustable overcurrent releases, test shall be made with the current and time settings at maximum.	Ir = 1,0 In, Ii = 10 In	P
	For circuit-breakers without overcurrent releases but fitted with a shunt release, this release shall be energized by the application of a voltage equal to 70 % of the rated control circuit supply voltage of the release (see 8.2.1.2.3), at a time not earlier than that of the initiation of the short-circuit nor later than 10 ms after the initiation of the short-circuit:		N/A
	A circuit-breaker having a dependent power operation shall be closed during tests with the control supply (voltage or pressure) at 85 % of its rated value:		N/A
	A circuit-breaker having an independent power operation shall be closed during tests with the operating mechanism charged to its maximum value stated by the manufacturer.		N/A
	A circuit-breaker having a stored energy operation shall be closed during tests with the operating means charged at 85 % of the rated voltage of the auxiliary supply:		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Distances of the metallic screen's: (all sides)	Up / Down: 80 mm Left / Right: 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 (mm^2):	120 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	6 Nm	P
9.3.6.2	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	This test is omitted for electronic trip units.		
	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.		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	 500 A 500 A 500 A	P
	Time specified by the manufacturer:	40 s ≤ t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	307 s 158 s 262 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.2 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A)..... L1-L2: ..... L2-L3: ..... L1-L3: .....N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: .....N-Lx:		N/A
9.3.5.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	439 Vac 439 Vac 439 Vac	P
	- RMS test current AC/DC: (kA).....L1: .....L2: L3:	50,5 kA 50,4 kA 50,1 kA	P
	Power factor/time constant:	0,22	P
	- Factor “n”	2,1	P
	- peak test current (kA): .....L1: .....L2: L3:	107 kA 87,7 kA 91,8 kA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence “O”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	21,9 kA 28,8 kA 15,8 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	1,29 MA^2s 2,34 MA^2s 389 kA^2s	P
	Pause, t: (min)	3 min 05 s	P
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	29,8 kA 14,9 kA 23,9 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	2,56 MA^2s 359 kA^2s 1,53 MA^2s	P
	Pause, t: (min)	3 min 06 s	P
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	24,0 kA 25,3 kA 8,57 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	1,17 MA^2s 1,54 MA^2s 94,6 kA^2s	P
	Melting of the fusible element	No melting of the fusible element	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence “O”	No holes	P
	Cracks observed	No cracks observed	P
9.3.5.3	Operational performance capability with current.		
	Rated current: In (A)	250 A	
	Maximum rated operational voltage: Ue (V)	415 Vac	
	Conductor cross-sectional area (mm^2):	120 mm^2	
	Number of operating cycles per hour	120 cycles per hour	P
	Number (5% of the number given in column 4, table 7) of cycles with current (total) (closing releases energized at the rated Uc)	50 cycles	P
	Applied voltage: closing releases (V)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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 In, Ii = 5 In	P
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,0 (V) ..... L1-L2: ..... L2-L3: L1-L3:	417 Vac 417 Vac 417 Vac	P
	- test current I/In = 1,0 (A).....L1: .....L2: L3:	252 A 257 A 259 A	P
	- power factor/time constant:	0,81	P
	- frequency: (Hz)	50 Hz	P
	- on-time (ms):	Min: 824 ms	P
	- off-time (s):	Max: 29,2 s	P
	This verification need not be made where, for a given frame size, the test of 9.3.5.2 has been made on a circuit-breaker of minimum I_n or at the minimum overload release setting as specified in Table 15.		N/A
9.3.5.4	Verification of dielectric withstand and leakage current		
	AC circuit-breaker: - equal to twice the rated operational voltage with a minimum of 1000 V RMS for 5 seconds, - or DC test voltage of 2 *U*e × 1,415 with a minimum of 1 415 V DC, in case of AC test voltage cannot be applied to the AC circuit-breaker	1000 Vac, 5 s	P
	DC circuit-breaker: - equal to 2 *U*e x 1,415 with a minimum of 1415 V DC for 5 seconds		N/A
	- no breakdown or flashover	See TABLE 6	P
	The leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 *U*e, and shall not exceed 2 mA. The corresponding test voltage shall be applied for 5 s	457 Vac L1: < 1,4 mA L2: < 1,4 mA L3: < 1,4 mA N: < 1,4 mA	P
9.3.5.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 6.	See TABLE 4	P
	Temperature rise of main circuit terminals. ≤ 80 K (K):	Max: 63 K	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm²):	120 mm²	P
	Test current In (A):	250 A	P
	This verification need not be made where, for a given frame size, the test of 9.3.5.2 has been made on a circuit-breaker of minimum I_n or at the minimum overload release setting as specified in Table 15.		N/A
9.3.5.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	362,5 A (1,45 x 1 x 250 A)	P
	Conventional tripping time: <1h when In ≤ 63A, <2h when In > 63 A	2 min 17 s	P
9.3.6.5	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.		
	For electromagnetic overcurrent releases the operating time shall not exceed the max. value stated by the manufacturer for twice the value of the current setting of a single pole at the reference temperature.		
	For electronic overcurrent releases the operating time shall comply with the tolerance band stated by the manufacturer for 2,5 times the value of the current setting of a single pole.		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	 625 A 625 A 625 A	P
	Time specified by the manufacturer:	t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	1 min 42 s 1 min 28 s 1 min 33 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.5 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A

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

9.3.5	**TEST SEQUENCE II/III (Ics=Icu):** GYCM8RT-250C, 100 A, 4P, reference temperature 55 °C, sample no. 5#		
9.3.5.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		
	Type designation or catalogue reference	GYCM8RT-250C	
	Sample no:	5#	
	Rated current: In (A)	100 A	
	Corresponding rated voltage: Ue (V)	415 Vac	
	Rated service short-circuit breaking capacity: (kA)	50 kA	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt release: Uc (V)	No shunt release	
	Rated control circuit supply voltage of undervoltage releases: Uc (V)	No undervoltage release	
	For circuit-breaker fitted with adjustable overcurrent releases, test shall be made with the current and time settings at maximum.	Ir = 0,7 In, Ii = 10 In	P
	For circuit-breakers without overcurrent releases but fitted with a shunt release, this release shall be energized by the application of a voltage equal to 70 % of the rated control circuit supply voltage of the release (see 8.2.1.2.3), at a time not earlier than that of the initiation of the short-circuit nor later than 10 ms after the initiation of the short-circuit:		N/A
	A circuit-breaker having a dependent power operation shall be closed during tests with the control supply (voltage or pressure) at 85 % of its rated value:		N/A
	A circuit-breaker having an independent power operation shall be closed during tests with the operating mechanism charged to its maximum value stated by the manufacturer.		N/A
	A circuit-breaker having a stored energy operation shall be closed during tests with the operating means charged at 85 % of the rated voltage of the auxiliary supply:		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P

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

	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Up / Down: 80 mm Left / Right: 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 (mm^2):	35 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	6 Nm	P
9.3.6.2	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	This test is omitted for electronic trip units.		
	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.		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	 140 A 140 A 140 A	P
	Time specified by the manufacturer:	40 s ≤ t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	311 s 283 s 290 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.2 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A)..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
9.3.5.2	Test of rated service short-circuit breaking capacity		
	Test sequence of operation: O – t – CO – t – CO		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	439 Vac 439 Vac 439 Vac	P
	- RMS test current AC/DC: (kA).....L1: .....L2: L3:	50,5 kA 50,4 kA 50,1 kA	P
	Power factor/time constant:	0,22	P
	- Factor “n”	2,1	P
	- peak test current (kA): .....L1: .....L2: L3:	107 kA 87,7 kA 91,8 kA	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sequence “O”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	20,9 kA 27,8 kA 15,6 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	1,14 MA^2s 2,14 MA^2s 382 kA^2s	P
	Pause, t: (min)	3 min 10 s	P
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	18,2 kA 26,0 kA 15,2 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	844 kA^2s 1,73 MA^2s 358 kA^2s	P
	Pause, t: (min)	3 min 04 s	P
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	24,6 kA 22,2 kA 19,6 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	2,22 MA^2s 877 kA^2s 1,06 MA^2s	P
	Melting of the fusible element	No melting of the fusible element	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence “O”	No holes	P
	Cracks observed	No cracks observed	P
9.3.5.3	Operational performance capability with current.		
	Rated current: In (A)		
	Maximum rated operational voltage: Ue (V)		
	Conductor cross-sectional area (mm^2):		
	Number of operating cycles per hour		N/A
	Number (5% of the number given in column 4, table 7) of cycles with current (total) (closing releases energized at the rated Uc)		N/A
	Applied voltage: closing releases (V)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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: L1-L3:		N/A
	- test current I/In = 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
	This verification need not be made where, for a given frame size, the test of 9.3.5.2 has been made on a circuit-breaker of minimum I_n or at the minimum overload release setting as specified in Table 15.		P
9.3.5.4	Verification of dielectric withstand and leakage current		
	AC circuit-breaker: - equal to twice the rated operational voltage with a minimum of 1000 V RMS for 5 seconds, - or DC test voltage of 2 *U*e × 1,415 with a minimum of 1 415 V DC, in case of AC test voltage cannot be applied to the AC circuit-breaker	1000 Vac, 5 s	P
	DC circuit-breaker: - equal to 2 *U*e x 1,415 with a minimum of 1415 V DC for 5 seconds		N/A
	- no breakdown or flashover	See TABLE 6	P
	The leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 *U*e, and shall not exceed 2 mA. The corresponding test voltage shall be applied for 5 s	457 Vac L1: < 1,4 mA L2: < 1,4 mA L3: < 1,4 mA N: < 1,4 mA	P
9.3.5.5	Verification of temperature-rise		
	- the values of temperature-rise do not exceed those specified in tab. 6.		N/A
	Temperature rise of main circuit terminals. ≤ 80 K (K):		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm²):		N/A
	Test current In (A):		N/A
	This verification need not be made where, for a given frame size, the test of 9.3.5.2 has been made on a circuit-breaker of minimum I_n or at the minimum overload release setting as specified in Table 15.		P
9.3.5.6	Verification of overload releases		
	Test current: 1,45 times the value of their current setting at the reference temperature: (A)	101,5 A (1,45 x 0,7 x 100 A)	P
	Conventional tripping time: <1h when In ≤ 63A, <2h when In > 63 A	1 min 42 s	P
9.3.6.5	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.		
	For electromagnetic overcurrent releases the operating time shall not exceed the max. value stated by the manufacturer for twice the value of the current setting of a single pole at the reference temperature.		
	For electronic overcurrent releases the operating time shall comply with the tolerance band stated by the manufacturer for 2,5 times the value of the current setting of a single pole.		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	 175 A 175 A 175 A	P
	Time specified by the manufacturer:	t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	1 min 34 s 1 min 20 s 1 min 47 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.5 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A

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

9.3.6	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** GYCM8RT-250C, 250 A, 3P, reference temperature 55 °C, sample no. 6#		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence VI applies, this test sequence applies to circuit-breaker of selectivity category A and to circuit-breaker of selectivity B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of selectivity 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 catalogue reference	GYCM8RT-250C	
	Sample no:	6#	
	Rated current: In (A)	250 A	
	Corresponding rated voltage: Ue (V)	415 Vac	
	Rated ultimate short-circuit breaking capacity: (kA)	50 kA	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt release: Uc (V)	No shunt release	
	Rated control circuit supply voltage of undervoltage releases: Uc (V)	No undervoltage release	
	This test sequence need not be made when Icu = Ics		
9.3.6.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	This test is omitted for electronic trip units.		
	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.		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	 500 A 500 A 500 A	P
	Time specified by the manufacturer:	40 s ≤ t ≤ 1000 s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	361 s 302 s 347 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.2 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A)..... L1-L2: ..... L2-L3: ..... L1-L3: .....N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: .....N-Lx:		N/A
9.3.6.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable overcurrent releases, test shall be made with the current and time settings at maximum.	Ir = 1,0 In, Ii = 10 In	P
	For circuit-breakers without overcurrent releases but fitted with a shunt release, this release shall be energized by the application of a voltage equal to 70 % of the rated control circuit supply voltage of the release (see 8.2.1.2.3), at a time not earlier than that of the initiation of the short-circuit nor later than 10 ms after the initiation of the short-circuit:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A circuit-breaker having a dependent power operation shall be closed during tests with the control supply (voltage or pressure) at 85 % of its rated value:		N/A
	A circuit-breaker having an independent power operation shall be closed during tests with the operating mechanism charged to its maximum value stated by the manufacturer.		N/A
	A circuit-breaker having a stored energy operation shall be closed during tests with the operating means charged at 85 % of the rated voltage of the auxiliary supply:		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Up / Down: 80 mm Left / Right: 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 (mm^2):	120 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) ..... L1-L2: ..... L2-L3: L1-L3:	439 Vac 439 Vac 439 Vac	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- RMS test current AC/DC: (kA) .....L1: .....L2: L3:	50,5 kA 50,4 kA 50,1 kA	P
	Power factor/time constant:	0,22	P
	- Factor “n”	2,1	P
	- peak test current (kA): .....L1: .....L2: L3:	107 kA 87,7 kA 91,8 kA	P
	Test sequence “O”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	21,9 kA 28,7 kA 16,3 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	1,23 MA^2s 2,30 MA^2s 418 kA^2s	P
	Pause, t: (min)	3 min 07 s	
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	28,7 kA 17,6 kA 22,2 kA	P
	- Joule integral I^2dt (kA^2s) .....L1: .....L2: L3:	2,50 MA^2s 520 kA^2s 1,33 MA^2s	P
	Melting of the fusible element	No melting of the fusible element	P
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence “O”	No holes	P
	Cracks observed	No cracks observed	P
9.3.6.4	Verification of dielectric withstand and leakage current		
	AC circuit-breaker: - equal to twice the rated operational voltage with a minimum of 1000 V RMS for 5 seconds, - or DC test voltage of 2 *U*e × 1,415 with a minimum of 1 415 V DC, in case of AC test voltage cannot be applied to the AC circuit-breaker	1000 Vac, 5 s	P
	DC circuit-breaker: - equal to 2 *U*e x 1,415 with a minimum of 1415 V DC for 5 seconds		N/A
	- no breakdown or flashover	See TABLE 7	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 *U*e, and shall not exceed 6 mA. The corresponding test voltage shall be applied for 5 s	457 Vac L1: < 4,2 mA L2: < 4,2 mA L3: < 4,2 mA N: < 4,2 mA	P
9.3.6.5	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.		
	For electromagnetic overcurrent releases the operating time shall not exceed the max. value stated by the manufacturer for twice the value of the current setting of a single pole at the reference temperature.		
	For electronic overcurrent releases the operating time shall comply with the tolerance band stated by the manufacturer for 2,5 times the value of the current setting of a single pole.		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	 625 A 625 A 625 A	P
	Time specified by the manufacturer:	t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	158 s 144 s 150 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.5 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A

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

9.3.6	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** GYCM8RT-250C, 250 A, 4P, reference temperature 55 °C, sample no. 7#, test for phase + N		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence VI applies, this test sequence applies to circuit-breaker of selectivity category A and to circuit-breaker of selectivity B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of selectivity 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 catalogue reference	GYCM8RT-250C	
	Sample no:	7#	
	Rated current: In (A)	250 A	
	Corresponding rated voltage: Ue (V)	415 Vac Tested at 415 Vac / √ 3	
	Rated ultimate short-circuit breaking capacity: (kA)	50 kA Tested at 30 kA	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt release: Uc (V)	No shunt release	
	Rated control circuit supply voltage of undervoltage releases: Uc (V)	No undervoltage release	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	This test sequence need not be made when Icu = Ics		
9.3.6.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	This test is omitted for electronic trip units.		
	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.		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	500 A	P
	Time specified by the manufacturer:	40 s ≤ t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	185 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.2 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A)..... L1-L2: ..... L2-L3: ..... L1-L3: .....N-Lx:		N/A
	Time specified by the manufacturer:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
9.3.6.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable overcurrent releases, test shall be made with the current and time settings at maximum.	Ir = 1,0 In, Ii = 10 In	P
	For circuit-breakers without overcurrent releases but fitted with a shunt release, this release shall be energized by the application of a voltage equal to 70 % of the rated control circuit supply voltage of the release (see 8.2.1.2.3), at a time not earlier than that of the initiation of the short-circuit nor later than 10 ms after the initiation of the short-circuit:		N/A
	A circuit-breaker having a dependent power operation shall be closed during tests with the control supply (voltage or pressure) at 85 % of its rated value:		N/A
	A circuit-breaker having an independent power operation shall be closed during tests with the operating mechanism charged to its maximum value stated by the manufacturer.		N/A
	A circuit-breaker having a stored energy operation shall be closed during tests with the operating means charged at 85 % of the rated voltage of the auxiliary supply:		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Up / Down: 80 mm Left / Right: 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):	120 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) .....L3-N: ..... L2-L3: L1-L3:	254,9 Vac	P
	- RMS test current AC/DC: (kA).....L1: .....L2: L3:	30,9 kA	P
	Power factor/time constant:	0,22	P
	- Factor “n”	2,1	P
	- peak test current (kA): .....L1: .....L2: L3:	67,6 kA	P
	Test sequence “O”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	15,2 kA	P
	- Joule integral I²dt (kA^2s) .....L1: .....L2: L3:	639 kA^2s	P
	Pause, t: (min)	3 min 05 s	
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	16,8 kA	P
	- Joule integral I²dt (kA^2s) .....L1: .....L2: L3:	606 kA^2s	P
	Melting of the fusible element	No melting of the fusible element	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence “O”	No holes	P
	Cracks observed	No cracks observed	P
9.3.6.4	Verification of dielectric withstand and leakage current		
	AC circuit-breaker: - equal to twice the rated operational voltage with a minimum of 1000 V RMS for 5 seconds, - or DC test voltage of 2 *U*e × 1,415 with a minimum of 1 415 V DC, in case of AC test voltage cannot be applied to the AC circuit-breaker	1000 Vac, 5 s	P
	DC circuit-breaker: - equal to 2 *U*e x 1,415 with a minimum of 1415 V DC for 5 seconds		N/A
	- no breakdown or flashover	See TABLE 7	P
	The leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 *U*e, and shall not exceed 6 mA. The corresponding test voltage shall be applied for 5 s	457 Vac L3: < 4,2 mA N: < 4,2 mA	P
9.3.6.5	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.		
	For electromagnetic overcurrent releases the operating time shall not exceed the max. value stated by the manufacturer for twice the value of the current setting of a single pole at the reference temperature.		
	For electronic overcurrent releases the operating time shall comply with the tolerance band stated by the manufacturer for 2,5 times the value of the current setting of a single pole.		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	625 A	P
	Time specified by the manufacturer:	t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	112 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.5 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A

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

9.3.6	**TEST SEQUENCE III (Icu): Rated ultimate short-circuit breaking capacity** GYCM8RT-250C, 100 A, 4P, reference temperature 55 °C, sample no. 8#, test for phase + N		
	Rated ultimate short-circuit breaking		
	Except where the combined test sequence VI applies, this test sequence applies to circuit-breaker of selectivity category A and to circuit-breaker of selectivity B having a rated ultimate short-circuit breaking capacity higher than the rated short-time withstand current.		
	For circuit-breakers of selectivity 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 catalogue reference	GYCM8RT-250C	
	Sample no:	8#	
	Rated current: In (A)	100 A	
	Corresponding rated voltage: Ue (V)	415 Vac Tested at 415 Vac / √ 3	
	Rated ultimate short-circuit breaking capacity: (kA)	50 kA Tested at 30 kA	
	Rated control circuit supply voltage of closing releases: Uc (V)	No closing release	
	Rated control circuit supply voltage of shunt release: Uc (V)	No shunt release	
	Rated control circuit supply voltage of undervoltage releases: Uc (V)	No undervoltage release	

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	This test sequence need not be made when Icu = Ics		
9.3.6.2	Verification of overload releases		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		
	This test is omitted for electronic trip units.		
	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.		
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A).....L1: .....L2: .....L3: ..... N:	140 A	P
	Time specified by the manufacturer:	40 s ≤ t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	224 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.2 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately: (A)..... L1-L2: ..... L2-L3: ..... L1-L3: .....N-Lx:		N/A
	Time specified by the manufacturer:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
9.3.6.3	Test of rated ultimate short-circuit breaking capacity		
	The test sequence of operations is O – t – CO		
	For circuit-breaker fitted with adjustable overcurrent releases, test shall be made with the current and time settings at maximum.	Ir = 0,7 In, Ii = 10 In	P
	For circuit-breakers without overcurrent releases but fitted with a shunt release, this release shall be energized by the application of a voltage equal to 70 % of the rated control circuit supply voltage of the release (see 8.2.1.2.3), at a time not earlier than that of the initiation of the short-circuit nor later than 10 ms after the initiation of the short-circuit:		N/A
	A circuit-breaker having a dependent power operation shall be closed during tests with the control supply (voltage or pressure) at 85 % of its rated value:		N/A
	A circuit-breaker having an independent power operation shall be closed during tests with the operating mechanism charged to its maximum value stated by the manufacturer.		N/A
	A circuit-breaker having a stored energy operation shall be closed during tests with the operating means charged at 85 % of the rated voltage of the auxiliary supply:		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	Up / Down: 80 mm Left / Right: 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):	120 mm^2	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6 Nm	P
	Test sequence of operation: O – t – CO		P
	- test voltage U/Ue = 1,05 (V) .....L3-N: ..... L2-L3: L1-L3:	254,9 Vac	P
	- RMS test current AC/DC: (kA).....L1: .....L2: L3:	30,9 kA	P
	Power factor/time constant:	0,22	P
	- Factor “n”	2,1	P
	- peak test current (kA): .....L1: .....L2: L3:	67,6 kA	P
	Test sequence “O”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	14,6 kA	P
	- Joule integral I²dt (kA^2s) .....L1: .....L2: L3:	570 kA^2s	P
	Pause, t: (min)	3 min 02 s	
	Test sequence “CO”		
	- max. let-through current: (kA peak) .....L1: .....L2: L3:	10,7 kA	P
	- Joule integral I²dt (kA^2s) .....L1: .....L2: L3:	223 kA^2s	P
	Melting of the fusible element	No melting of the fusible element	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Damage to insulation on conductors	No damage	P
	Holes in the PE-sheet for test sequence “O”	No holes	P
	Cracks observed	No cracks observed	P
9.3.6.4	Verification of dielectric withstand and leakage current		
	AC circuit-breaker: - equal to twice the rated operational voltage with a minimum of 1000 V RMS for 5 seconds, - or DC test voltage of 2 *U*e × 1,415 with a minimum of 1 415 V DC, in case of AC test voltage cannot be applied to the AC circuit-breaker	1000 Vac, 5 s	P
	DC circuit-breaker: - equal to 2 *U*e x 1,415 with a minimum of 1415 V DC for 5 seconds		N/A
	- no breakdown or flashover	See TABLE 7	P
	The leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of 1,1 *U*e, and shall not exceed 6 mA. The corresponding test voltage shall be applied for 5 s	457 Vac L3: < 4,2 mA N: < 4,2 mA	P
9.3.6.5	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.		
	For electromagnetic overcurrent releases the operating time shall not exceed the max. value stated by the manufacturer for twice the value of the current setting of a single pole at the reference temperature.		
	For electronic overcurrent releases the operating time shall comply with the tolerance band stated by the manufacturer for 2,5 times the value of the current setting of a single pole.		
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) .....L1: .....L2: .....L3: ..... N:	175 A	P
	Time specified by the manufacturer:	t ≤ 1000 s	P
	- Operation time: (s) .....L1: .....L2: .....L3: ..... N:	131 s	P
	If applicable, ground-fault overcurrent releases shall be deactivated during the test;		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Alternatively, each pole shall be tested in series with 2 other poles connected in parallel: (A)... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2/L3: ..... L2-L1/L3: ..... L3-L1/L2: ..... N-Lx/Lx:		N/A
	For the purpose of verifying the correct operation of the overload releases of CBR, the single pole tests specified in 9.3.6.5 shall be replaced by two-pole tests, on all possible combinations of phase poles in turn.		N/A
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately: (A) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A
	Time specified by the manufacturer:		N/A
	- Operation time: (s) ..... L1-L2: ..... L2-L3: ..... L1-L3: ..... N-Lx:		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.7	**TEST SEQUENCE IV (Icw): Rated short-time withstand current**		N/A
9.3.8	**TEST SEQUENCE V: Performance of integrally fused circuit-breakers**		N/A
9.3.9	**TEST SEQUENCE VI: Combined test sequence**		N/A
9.3.10	**TEST SEQUENCE VII: Critical DC load current**		N/A
9.3.11	**TEST SEQUENCE VIII (Icu1): Rated individual pole ultimate short-circuit breaking capacity at phase-to-neutral AC voltage**		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
Annex H	**Individual pole short-circuit test sequence**		N/A
Annex J	**Electromagnetic compatibility (EMC) – Requirements and test methods for circuit-breakers**		N/A
Annex L	**Circuit-breakers not fulfilling the requirements for overcurrent protection (CBIs)**		N/A
Annex M	**Modular residual current devices (without integral current breaking device)**		N/A
Annex N	**Electromagnetic compatibility (EMC) –** **Additional requirements and test methods for devices not covered by Annexes B, F and M**		N/A
Annex O	**Instantaneous trip circuit-breakers (ICBs)**		N/A
Annex P	**DC circuit-breakers for use in photovoltaic (PV) applications**		N/A
Annex R	**Circuit-breakers incorporating residual current protection with automatic reclosing functions (CBARs)**		N/A

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

	TABLE 1: Heating Test (Seq. I, 9.3.4.7, sample number 1#)		P
	Test current (A):	250 A	—
	Ambient (°C):	24 °C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
3 Phases test		
Terminal of top left phase pole	67	80
Terminal of top centre phase pole	71	80
Terminal of top right phase pole	75	80
Terminal of bottom left phase pole	63	80
Terminal of bottom centre phase pole	69	80
Terminal of bottom right phase pole	71	80
Handle	5	35
Front cover	18	50
Side	36	60
Supplementary information: N/A		

	TABLE 2: Heating Test (Seq. I, 9.3.4.7, sample number 2#)		P
	Test current (A):	250 A	—
	Ambient (°C):	24 °C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
3 Phases test		
Terminal of top left phase pole	73	80
Terminal of top centre phase pole	72	80
Terminal of top right phase pole	67	80
Terminal of bottom left phase pole	68	80
Terminal of bottom centre phase pole	68	80
Terminal of bottom right phase pole	64	80
Handle	5	35
Front cover	17	50
Side	34	60
Supplementary information: N/A		

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

	TABLE 3: Heating Test (Seq. II/III, 9.3.5.5, sample number 3#)		P
	Test current (A):	250 A	—
	Ambient (°C):	25 °C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
3 Phases test		
Terminal of top left phase pole	59	80
Terminal of top centre phase pole	57	80
Terminal of top right phase pole	58	80
Terminal of bottom left phase pole	53	80
Terminal of bottom centre phase pole	55	80
Terminal of bottom right phase pole	52	80
Supplementary information: N/A		

	TABLE 4: Heating Test (Seq. II/III, 9.3.5.5, sample number 4#)		P
	Test current (A):	250 A	—
	Ambient (°C):	25 °C	—

Thermocouple Locations	**max. temperature rise measured, (K)**	**max. temperature limit, (K)**
3 Phases test		
Terminal of top left phase pole	60	80
Terminal of top centre phase pole	57	80
Terminal of top right phase pole	63	80
Terminal of bottom left phase pole	53	80
Terminal of bottom centre phase pole	59	80
Terminal of bottom right phase pole	58	80
Supplementary information: N/A		

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

	TABLE 5: dielectric strength (Seq I, 9.3.4.6, 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 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 not normally connected to the main circuit and the main circuit	N/A	N/A
Between the incoming and outgoing terminals with the circuit-breaker open	1000 Vac	No
supplementary information: N/A		

	TABLE 6: dielectric strength (Seq. II/III, 9.3.5.4, sample number 3# - 5#)	P

test voltage applied between:	**test potential applied (V)**	**breakdown / flashover (Yes/No)**
Between all the terminals of the main circuit connected together 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 not normally connected to the main circuit and the main circuit	N/A	N/A
Between the incoming and outgoing terminals with the circuit-breaker open	1000 Vac	No
supplementary information: N/A		

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

	TABLE 7: dielectric strength (Seq. III, 9.3.6.4, sample number 6# - 8#)	P

test voltage applied between:	**test potential applied (V)**	**breakdown / flashover (Yes/No)**
Between all the terminals of the main circuit connected together 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 not normally connected to the main circuit and the main circuit	N/A	N/A
Between the incoming and outgoing terminals with the circuit-breaker open	1000 Vac	No
supplementary information: N/A		

	TABLE 8: 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 poles	1000 V	8 kV	8 mm	17,0 mm	16 mm	25,2 mm
Between live parts and parts intended to be earthed	1000 V	8 kV	8 mm	21,9 mm	16 mm	21,9 mm
Between the contacts in the open position	1000 V	8 kV	8 mm	24,6 mm	16 mm	38,8 mm
Between live parts and actuator	1000 V	8 kV	8 mm	28,3 mm	16 mm	35,6 mm
Supplementary information: N/A						

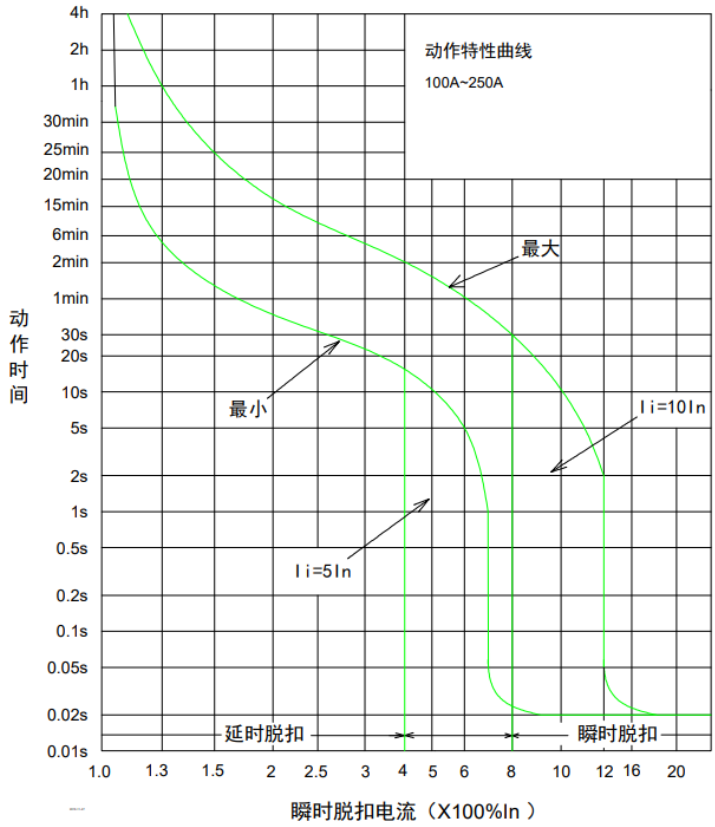
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE 9: 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**	
Base / DMC-2	Black	Yueging Kaima Electric Appliance Manufacturing Co., LTD	-	-	no ignition		P
Front cover / PA6 G/F30%	White	Yueging Xnhong Electrical Accessories Co., LTD	no ignition		-	-	P
Front cover / PA6 G/F30%	Black	Yueging Xnhong Electrical Accessories Co., LTD	no ignition		-	-	P
Middle cover / DMC-2	White	Yueging Kaima Electric Appliance Manufacturing Co., LTD	-	-	no ignition		P
Middle cover / DMC-2	Black	Yueging Kaima Electric Appliance Manufacturing Co., LTD	-	-	no ignition		P
Axis of moving contact / DMC-1	Black	Yueging Kaima Electric Appliance Manufacturing Co., LTD	-	-	no ignition		P
Leading lever / PPA	Beige	Yueging Xnhong Electrical Accessories Co., LTD	-	-	31,5	0,5	P
Base plate / Epoxy board	Black	Zheiiang Xngpu Electric Appliance Co., LTD	no ignition		-	-	P
Handle / PA6 G/F30%	Black	Yueging Xnhong Electrical Accessories Co., LTD	no ignition		-	-	P
The test specimen passed the glow wire test (GWT) with no ignition (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
If flames or glowing combustion of the test specimen extinguish within 30 s after removal of the glow wire, i.e. $t_E \leq t_A + 30$ s; and (Yes/No) :							Yes
Ignition of the specified layer placed underneath the test specimen (Yes/No) :							No
Supplementary information: N/A							

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

	TABLE 10: Threaded Part Torque Test		
Threaded part identification	**Diameter of thread (mm)**	**Column number (I, II, or III)**	**Applied torque (Nm)**
Screws can be tightened by means other than a screwdriver	8	III	6 Nm
Supplementary information: N/A			

Time current characteristics

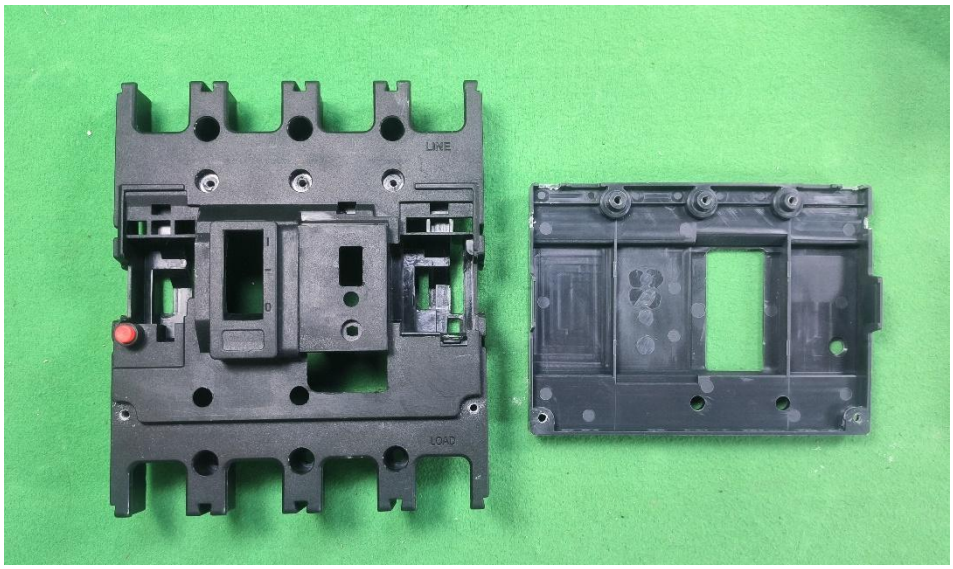


Photographs

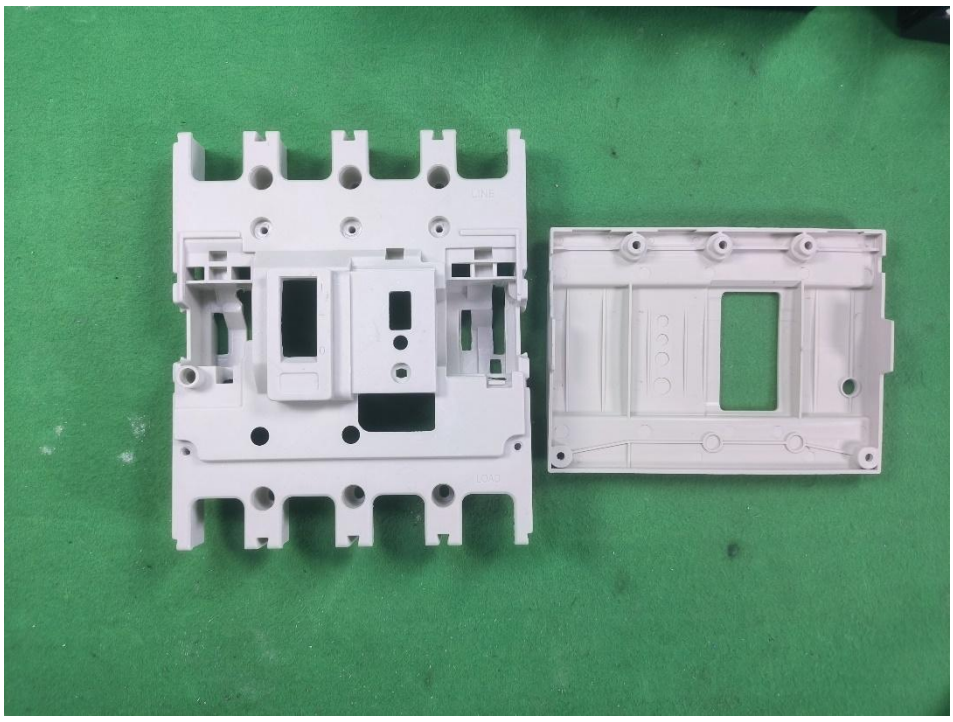
Front view, GYCM8RT-250C, 4P, 250 A, 55 °C

Front view, GYCM8RT-250M, 3P, 100 A, 40 °C

Front view, GYCM8-250H, 4P, 250 A, 55 °C



Internal view of black cover, 4P



Internal view of white cover, 4P

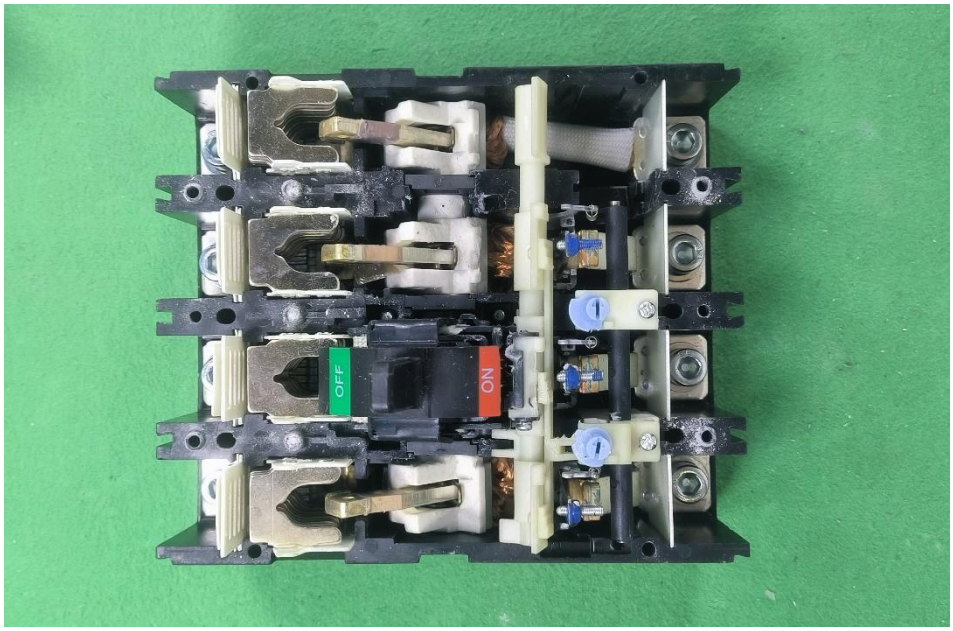
Line terminal view, 4P

Load terminal view, 4P

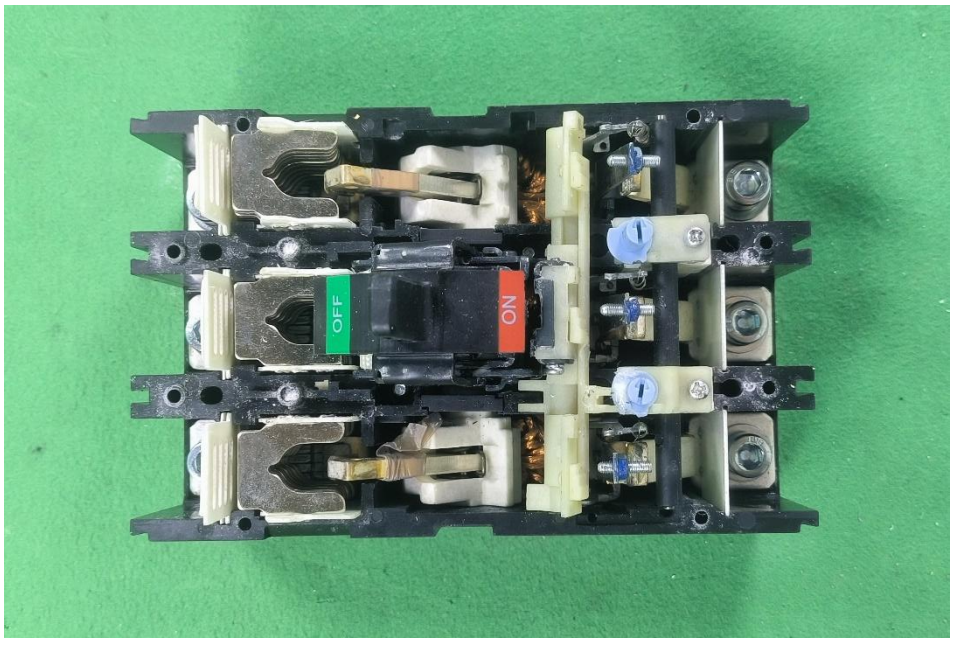
side view with white cover, 4P

side view with black cover, 4P

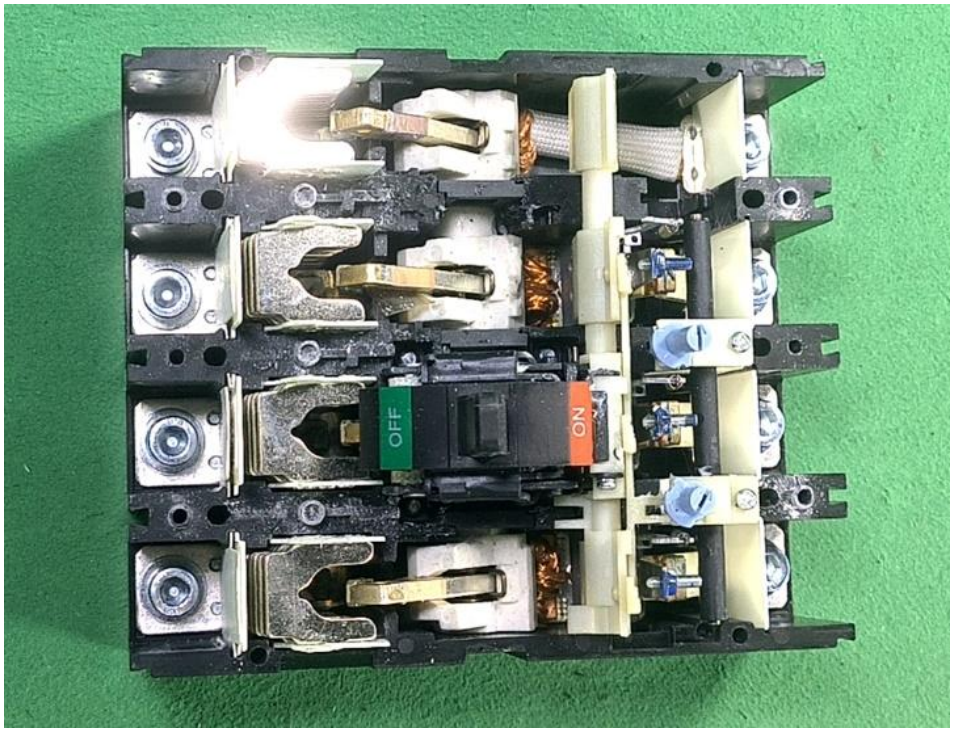
Back view, 4P



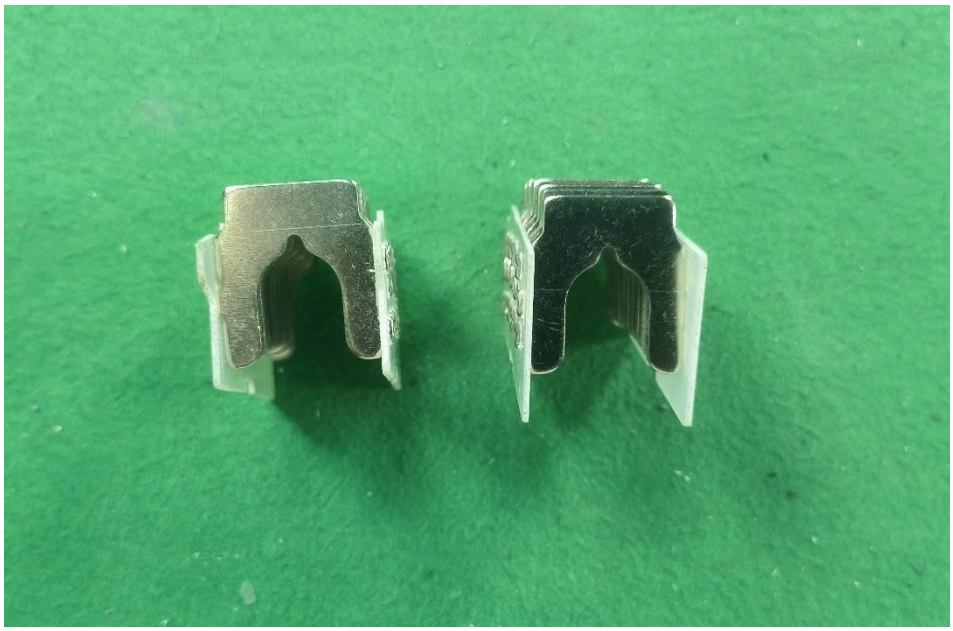
Internal view, GYCM8RT-250C, 4P, 250 A, 55 °C



Internal view, GYCM8RT-250M, 3P, 100 A, 40 °C



Internal view, GYCM8-250H, 4P, 250 A, 55 °C



Arc chamber

Arc chamber

Arc chamber