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TESTING
CNAS L0354

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

Report Reference No.: A231303

Tested by (name + signature).....:	CHEN ZHOU / LI HAIDA	李海达
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Approved by (name + signature).....:	WU XIAOYANG	
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Date of issue : 2024.03.26

Standard: IEC 60947-2:2019

Test conclusion.....: The items tested meet the standard requirements.

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Applicant's Name	MAJE DO NE IND E COM DE MATERIAIS ELETRICOS LTDA
Address	ROD PE 05 LOTE 1 QUADRA A LOT 01ST. IND SANTOS DUMONT. TIUMA, SAO LOURENCO DA MATA. 54737-200, BRAZIL

Test item description

Trademark	ELETROMAR
Manufacturer	
Model and/or type reference	/

General remarks

This report is not valid without official seal and signatures.
 The test results presented in this report relate only to the object tested.
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
 Any objection should be raised to the testing laboratory in 15 days since the day this report be received.

Summary of testing:

The following tests were done on the samples.

	Sub-clause	Sample number	
IEC 60947-2 Test according to sub-clause	8.3.3.2	#1,#10	
	8.3.3.3	#1,#10	
	8.3.3.4	#1,#10	
	8.3.3.5	#1,#10	
	8.3.3.6	#1,#10	
	8.3.3.7	#1,#10	
	8.3.3.8	#1,#10	
	8.3.3.10	#1,#10	
	8.3.4.2	#2,#3,#4,#11,#12,#13	
	8.3.4.3	#2,#3,#4,#11,#12,#13	
	8.3.4.4	#2,#3,#4,#11,#12,#13	
	8.3.4.5	#2,#3,#4,#11,#12,#13	
	8.3.4.6	#2,#3,#4,#11,#12,#13	
	8.3.5.2	#5,#6,#7,#14,#15,#16	
	8.3.5.3	#5,#6,#7,#14,#15,#16	
	8.3.5.4	#5,#6,#7,#14,#15,#16	
	8.3.5.5	#5,#6,#7,#14,#15,#16	
	Annex H	#8,#17	
	IEC 60947-1 Test according to sub-clause	9.2.5.2	#9,#18
		8.1.4	#9,#18
8.1.2.2		#9,#18	

This test report is issued to replace the previous test report No.A231303 date 2023-09-22 for the rating of the products / is added. All the tests are performed according to the Table 10 to verified the products with different rated current. The rating of the products is list on page 5 General product information.

Photos:#1



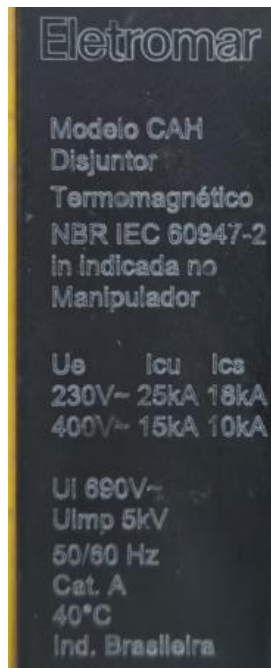
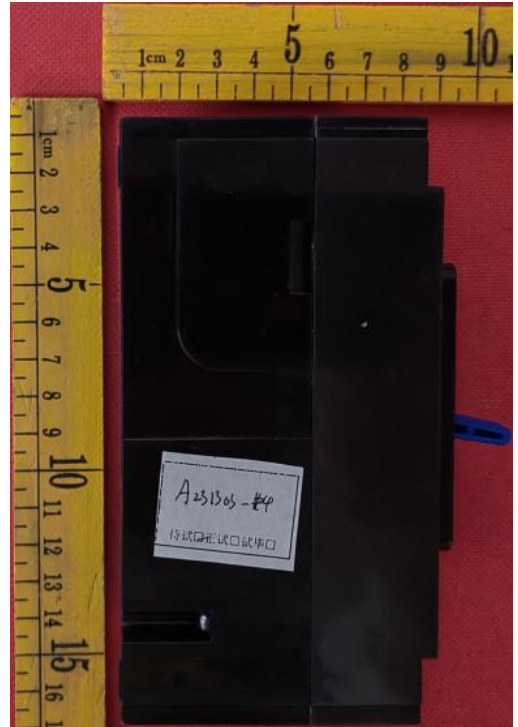
Eletromar

Modelo CAH
 Disjuntor Termomagnético
 NBR IEC 60947-2
 In indicada no Manipulador

Ue	Icu	Ics
230V~	25kA	20kA
400V~	20kA	15kA

UI 690V~
 Uimp 5kV
 50/60 Hz
 Cat. A
 40°C
 Ind. Brasileira

#4



#10



Eletromar

Modelo CAH
Disjuntor Termomagnético
NBR IEC 60947-2
in indicada no Manipulador

U _e	I _{cu}	I _{cs}
230V~	25kA	20kA
400V~	20kA	15kA

UI 690V~
U_{imp} 5kV
50/60 Hz
Cat. A
40°C
Ind. Brasileira

#13



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..... : 2023.12.21

Date (s) of performance of tests..... : 2023.12.21~2024.01.15

General remarks:

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

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"(see Enclosure #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

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

General product information:

test samples information:

#1: 3P,Ue=400V,In=150A,Uimp=5kV,Ui=690V,Reference temperature:+40°C

#2: 3P,Ue=400V,In=150A,Ics=10kA #3: 3P,Ue=230V,In=150A,Ics=18kA

#4: 3P,Ue=230V,In=40A,Ics=18kA #5: 3P,Ue=400V,In=150A,Icu=15kA

#6: 3P,Ue=230V,In=150A,Icu=25kA #7: 3P,Ue=230V,In=40A,Icu=25kA

#8: 3P,Ue=400V,In=150A,IIT=1.8kA,Reference temperature:+40°C

#9: 3P,Ue=400V,In=150A,Pollution degree:3,Material group:IIIa

#10: 3P,Ue=400V,In=250A,Uimp=5kV,Ui=690V,Reference temperature:+40°C

#11: 3P,Ue=400V,In=250A,Ics=15kA #12: 3P,Ue=230V,In=250A,Ics=20kA

#13: 3P,Ue=230V,In=125A,Ics=20kA #14: 3P,Ue=400V,In=250A,Icu=20kA

#15: 3P,Ue=230V,In=250A,Icu=25kA #16: 3P,Ue=230V,In=125A,Icu=25kA

#17: 3P,Ue=400V,In=250A,IIT=3kA,Reference temperature:+40°C

#18: 3P,Ue=400V,In=250A,Pollution degree:3,Material group:IIIa

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8	TESTS		—
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		—
8.3.3.2	Test of tripping limits and characteristic		—
8.3.3.2.2	Short circuit releases		—
	Manufacturer's name or trademark	ELETROMAR	—
	Type designation or serial number	/	—
	Sample no:	#1	—
	Rated operational voltage: Ue (V)	400V	—
	Rated current: In (A)	150A	—
	Ambient temperature -5°C~+40°C:	22.4°C	P
	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)	1500A	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)	1212A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: >0.2s L1-L3: >0.2s L2-L3: >0.2s N-Lx:		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)	1811A	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: 16.8ms L1-L3: 18.4ms L2-L3: 14.5ms N-Lx:		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)	1814A	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < 0,2 s in case of instantaneous release: L1: L2: L3: N:	12.1ms 10.5ms 16.5ms	P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
8.3.3.2.3	Overload releases		—
a)	Instantaneous or definite time-delay releases		—
	Manufacturer's name or trademark		—
	Type designation or serial number		—
	Sample no:		—
	Rated operational voltage: Ue (V)		—
	Rated current: In (A)		—
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	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

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
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		—
	Manufacturer's name or trademark	ELETROMAR	—
	Type designation or serial number	/	—
	Sample no:	#1	—
	Rated operational voltage: Ue (V)	400V	—
	Rated current: In (A)	150A	—
	For releases dependent of ambient air temperature: Reference temperature	40±2°C	P
	Test ambient temperature (°C)	40.1°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:	21.5°C	P
	Range of adjustable setting current: (A)	150A	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)	157.9A	P
	Conventional non-tripping time: 1h when In ≤ 63A, 2h when In > 63 A	>2h	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 130% of the rated, or minimum adjustable setting current: (A)	195.1A	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 $I_n < 63A$, <2h when $I_n > 63 A$	198s	P
8.3.3.3	Test of dielectric properties, impulse withstand voltage (U_{imp} indicated):		—
8.3.3.4 part1	The 1,2/50 μ s impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		—
	- rated impulse withstand voltage (kV) :	5kV	P
	- sea level of the laboratory:	5m	P
	- test U_{imp} main circuits (kV) :	7.3kV	P
	- test U_{imp} auxiliary circuits (kV) :		N/A
	- test U_{imp} control circuits (kV) :		N/A
	- test U_{imp} on open main contacts (equipment suitable for isolating) (kV) :	9.8kV	P
a)	Application of test voltage		—
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.	7.3kV	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.	7.3kV	P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and:		N/A
	- the main circuit		N/A
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) equipment suitable for isolation	9.8kV	P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (U_{imp} not indicated):		—
	- rated insulation voltage (V) :	690V	P
	- main circuits, test voltage for 1 min (V)	1892V	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Application of test voltage		—
1)	with circuit-breaker in the closed position		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		—
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		P
(i)	the normal positions of operation include the tripped position, if any;		P
(ii)	circuits incorporating solid-state devices connected to the main circuit shall be disconnected for the test;		N/A
(iii)	circuit-breakers not declared as suitable for isolation shall be tested with the test voltage applied across the poles of the main circuit, the line terminals being connected together and the load terminals being connected together.		N/A
(iv)	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$, and shall not exceed 0,5mA.	L1:440V,0.006mA L2:440V,0.004mA L3:440V,0.006mA	P
(v)	circuit-breakers having a rated insulation voltage greater than 1 000 V a.c. shall be tested at a voltage of $U_i + 1\ 200$ V a.c. r.m.s. or $2 U_i$ whichever is the greater		N/A
(vi)	withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		N/A

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Mechanical operation and operational performance capability		—
8.3.3.4.2	Construction and mechanical operation		—
8.3.3.4.2.1	Construction		—
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.2		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		N/A
8.3.3.4.2.2	Mechanical operation		—
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.4		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		P
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
8.3.3.4.2.3	Undervoltage releases		—
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		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

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.7		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		—
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		—
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
8.3.3.4.2.4	Shunt releases		—
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+ 55\text{ °C} \pm 2\text{ °C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.4.3	Operational performance capability without current.		—
	Type designation or serial number		—
	Sample no:	#1	—
	Rated current I_n (A)	150A	—
	Rated operational voltage: U_e (V)	400V	—

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated control supply voltage of closing mechanism: U_c (V)		N/A
	Rated control supply voltage of shunt releases: U_c (V)		N/A
	Rated control supply voltage undervoltage releases: U_c (V)		N/A
	Ambient temperature 10-40 °C :	23.2°C	P
	Number of operating cycles per hour	120	P
	Number of cycles without current (total) (closing mechanism energized at the rated U_c)	7000	P
	Number of cycles without current (without releases)		N/A
	Applied voltage of closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated U_c		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated U_c		N/A
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.4.4	Operational performance capability with current.		—
	Rated current: I_n (A)	150A	—
	Maximum rated operational voltage: U_e (V)	400V	—
	Conductor cross-sectional area (mm^2) :	50 mm^2	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	1000	P
	Applied voltage: closing mechanism (V)		N/A

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 $U/U_e = 1,0$ (V):	403V	P
	- test current $I/I_n = 1,0$ (A):	151.2A	P
	- power factor/time constant:	0.81	P
	- frequency: (Hz)	50Hz	P
	- on-time (ms):	See the oscillogram NO:SSA231303-#1-01~03	P
	- off-time (s):	30s	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		—
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.5	Overload performance		—
	this test applies to circuit-breaker of rated current up to and including 630 A		—
	Type designation or serial number		—
	Sample no:	#1	—
	Rated current I_n (A)	150A	—
	Rated operational voltage: U_e (V)	400V	—
	Rated control supply voltage of closing mechanism: U_c (V)		N/A
	Rated control supply voltage of shunt releases: U_c (V)		N/A
	Rated control supply voltage undervoltage releases: U_c (V)		N/A
	Ambient temperature 10-40 °C :	23.2°C	P
	Number of operating cycles per hour	120	P
	Maximum rated operational voltage: U_e (V)	400V	P
	Number of operating cycles per hour		N/A
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)		N/A
	Applied voltage: closing mechanism (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.		N/A
	Conditions, overload operations:		—
	- test voltage: $U/U_e = 1,05$ (V)	423V	P
	- test current AC/DC: $I/I_n = 6,0/2.5$ (A)	933A	P
	- power factor/time constant:	0.51	P
	- Number of cycles manually opened: 9	9	P
	- Number of cycles automatically opened by an overload release: 3	3	P
	for circuit-breakers having a short-circuit release of a maximum setting less than the test current		—
	all 12 operations automatic		N/A
	If the testing means do not withstand the let-through energy occurring during the automatic operation		—
	– 12 manual operations – three additional operations with automatic opening, made at any convenient voltage		N/A
	- frequency: (Hz)	50Hz	P
	- on-time max 2s:	See the oscillogram NO:SFA231303-#1-01~06	P
	Operating rate if different from Table 8		N/A
8.3.3.6	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1002V/5s	P
	- no breakdown or flashover		P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$, and shall not exceed 2 mA.	L1:440V,0.017mA L2:440V,0.015mA L3:440V,0.015mA	P
8.3.3.7	Verification of temperature-rise		—
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	71.8K	P
	conductor cross-sectional area (mm ²) :	50 mm ² × 2m	P
	test current I_e (A) :	150.4A	P
8.3.3.8	Verification of overload releases		—
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	217.8A	P
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$	4min43s	P
8.3.3.10	Verification of the main contact position for circuit-breakers for isolation		—

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	actuating force for opening (N)	54N	P
	test force with blocked main contacts for 10 s (N) .	150N	P
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8	TESTS		—
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		—
8.3.3.2	Test of tripping limits and characteristic		—
8.3.3.2.2	Short circuit releases		—
	Manufacturer's name or trademark	ELETROMAR	—
	Type designation or serial number	/	—
	Sample no:	#10	—
	Rated operational voltage: Ue (V)	400V	—
	Rated current: In (A)	250A	—
	Ambient temperature -5°C~+40°C:	22.4°C	P
	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)	2500A	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)	2014A	P
	Operating time: >0,2s in case of instantaneous releases: L1-L2: >0.2s L1-L3: >0.2s L2-L3: >0.2s N-Lx:		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)	3022A	P
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases: L1-L2: 27.5ms L1-L3: 21.1ms L2-L3: 27.3ms N-Lx:		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

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current: tripping current declared for single pole operation (A)	3031A	P
	Operating time: < 0,2 s in case of instantaneous release: L1: L2: L3: N:	29.8ms 18.4ms 29.2ms	P
	Operating time: < twice time delay stated by manufacturer in case of definite time delay releases L1: L2: L3: N:		N/A
8.3.3.2.3	Overload releases		—
a)	Instantaneous or definite time-delay releases		—
	Manufacturer's name or trademark		—
	Type designation or serial number		—
	Sample no:		—
	Rated operational voltage: Ue (V)		—
	Rated current: In (A)		—
	Ambient temperature 10-40 °C :		N/A
	Value of the tripping current declared by the manufacturer for a single pole, at which value they shall operate.		N/A
	Range of adjustable setting current. (A)		N/A
	Time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the rated, or minimum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases:		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 90% of the maximum adjustable setting current: (A)		N/A
	Operating time: >0,2s in case of instantaneous releases		N/A
	Operating time: > twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
	Test current: 110% of the maximum adjustable setting current: (A) circuit-breaker with neutral pole: 1,2x110% (A)		N/A
	Operating time: <0,2s in case of instantaneous releases		N/A
	Operating time: < twice time delay stated by the manufacturer, in the case of definite time delay releases.		N/A
b)	Inverse time delay releases		—
	Manufacturer's name or trademark	ELETROMAR	—
	Type designation or serial number	/	—
	Sample no:	#10	—
	Rated operational voltage: Ue (V)	400V	—
	Rated current: In (A)	250A	—
	For releases dependent of ambient air temperature: Reference temperature	40±2°C	P
	Test ambient temperature (°C)	40.1°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:	21.3°C	P
	Range of adjustable setting current: (A)	250A	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)	263.0A	P
	Conventional non-tripping time: 1h when In ≤ 63A, 2h when In > 63 A	>2h	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current: 130% of the rated, or minimum adjustable setting current: (A)	325.2A	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 $I_n < 63A$, <2h when $I_n > 63 A$	103s	P
8.3.3.3	Test of dielectric properties, impulse withstand voltage (U_{imp} indicated):		—
8.3.3.4 part1	The 1,2/50 μ s impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		—
	- rated impulse withstand voltage (kV) :	5kV	P
	- sea level of the laboratory:	5m	P
	- test U_{imp} main circuits (kV) :	7.3kV	P
	- test U_{imp} auxiliary circuits (kV) :		N/A
	- test U_{imp} control circuits (kV) :		N/A
	- test U_{imp} on open main contacts (equipment suitable for isolating) (kV) :	9.8kV	P
a)	Application of test voltage		—
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.	7.3kV	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.	7.3kV	P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and:		N/A
	- the main circuit		N/A
	- other circuits		N/A
	- exposed conductive parts		N/A
	- enclosure of mounting plate		N/A
	iv) equipment suitable for isolation	9.8kV	P
	equipment not suitable for isolation		N/A
	- no unintentional disruptive discharge during the test's		P
	Test of dielectric properties, dielectric withstand voltage (U_{imp} not indicated):		—
	- rated insulation voltage (V) :	690V	P
	- main circuits, test voltage for 1 min (V)	1892V	P
	- auxiliary circuits, test voltage for 1 min (V)		N/A
	- control circuits, test voltage for 1 min (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Application of test voltage		—
1)	with circuit-breaker in the closed position		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker .		P
	- between each pole and all the other poles connected to the frame of the circuit-breaker		P
2)	with the circuit-breaker in the open position and, additionally, in the tripped position, if any.		P
	- between all live parts of all poles connected together and the frame of the circuit-breaker.		P
	- between the terminals of one side connected together and the terminals of the other side connected together.		P
b)	Control and auxiliary circuits		—
1)	- between all the control and auxiliary circuits which are not normally connected to the main circuit, connected together, and the frame of the circuit-breaker.		N/A
2)	- where appropriate, between each part of the control an auxiliary circuits which may be isolated from the other parts during normal operation and all the other parts connected together.		N/A
	No unintentional disruptive discharge during the tests		P
(i)	the normal positions of operation include the tripped position, if any;		P
(ii)	circuits incorporating solid-state devices connected to the main circuit shall be disconnected for the test;		N/A
(iii)	circuit-breakers not declared as suitable for isolation shall be tested with the test voltage applied across the poles of the main circuit, the line terminals being connected together and the load terminals being connected together.		N/A
(iv)	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$, and shall not exceed 0,5mA.	L1:440V,0.005mA L2:440V,0.005mA L3:440V,0.007mA	P
(v)	circuit-breakers having a rated insulation voltage greater than 1 000 V a.c. shall be tested at a voltage of $U_i + 1\ 200$ V a.c. r.m.s. or $2 U_i$ whichever is the greater		N/A
(vi)	withdrawable circuit-breakers shall be subject to verification of impulse withstand voltage and shall be applied between the withdrawable unit's main contacts and their associated fixed contacts, in the disconnected position.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Mechanical operation and operational performance capability		—
8.3.3.4.2	Construction and mechanical operation		—
8.3.3.4.2.1	Construction		—
	A withdrawable circuit-breaker shall be checked for the requirements stated in 7.1.2		N/A
	A circuit-breaker with stored energy operation shall be checked for compliance with 7.2.1.1.6, regarding the charge indicator and the direction of operation of manual energy storing		N/A
8.3.3.4.2.2	Mechanical operation		—
	A circuit-breaker with dependent power operation shall comply with the requirements stated in 7.2.1.1.4		N/A
	A circuit-breaker with dependent power operation shall operate with the operating mechanism charged to the minimum and maximum limits stated by the manufacturer		N/A
	A circuit-breaker with stored energy operation shall comply with the requirements stated in 7.2.1.6 with the auxiliary supply voltage at 85% and 110% of the rated control supply voltage.		N/A
	It shall also be verified that the moving contacts cannot be moved from the open position when the operating mechanism is charged to slightly below the full charge as evidenced by the indicating device		P
	For a trip-free circuit-breaker it shall not be possible to maintain the contacts in the touching or closed position when the tripping release is in the position to trip the circuit-breaker		P
	If the closing and opening times of a circuit-breaker are stated by the manufacturer, such times shall comply with the stated values		N/A
8.3.3.4.2.3	Undervoltage releases		—
	Undervoltage releases shall comply with the requirements of 7.2.1.3 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum current rating for which the release is suitable		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

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Clause	Requirement + Test	Result - Remark	Verdict
	In the case of a release with a range of rated voltages, this test applies to the maximum voltage of the range		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles of the circuit-breaker		N/A
	This test may be combined with the temperature-rise test of 8.3.3.7		N/A
	In the case of a release with a range of rated voltages, this test is made at both the minimum and maximum rated control supply voltages		N/A
ii)	Test for limits of operation		—
	Starting with the circuit-breaker open, at the temperature of the test room, and with the supply voltage at 30% rated maximum control supply voltage, it shall be verified that the circuit-breaker cannot be closed by the operation of the actuator		N/A
	When the supply voltage is raised to 85% of the minimum control supply voltage, it shall be verified that the circuit-breaker can be closed by the operation of the actuator		N/A
iii)	Performance under overvoltage conditions		—
	With the circuit-breaker closed and without current in the main circuit, it shall be verified that the undervoltage release will withstand the application of 110% rated control supply voltage for 4 h without impairing its functions		N/A
8.3.3.4.2.4	Shunt releases		—
	Shunt releases shall comply with the requirements of 7.2.1.4 of Part 1. For this purpose, the release shall be fitted to a circuit-breaker having the maximum rated current for which the release is suitable		N/A
	It shall be verified that the release will operate to open the circuit-breaker at 70% rated control supply voltage when tested at an ambient temperature of $+ 55\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ without current in the main poles of the circuit-breaker		N/A
	In the case of a release having a range of rated control supply voltages, the test voltage shall be 70% of the minimum rated control supply voltage		N/A
8.3.3.4.3	Operational performance capability without current.		—
	Type designation or serial number		—
	Sample no:	#10	—
	Rated current I_n (A)	250A	—
	Rated operational voltage: U_e (V)	400V	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated control supply voltage of closing mechanism: U_c (V)		N/A
	Rated control supply voltage of shunt releases: U_c (V)		N/A
	Rated control supply voltage undervoltage releases: U_c (V)		N/A
	Ambient temperature 10-40 °C :	23.2°C	P
	Number of operating cycles per hour	120	P
	Number of cycles without current (total) (closing mechanism energized at the rated U_c)	7000	P
	Number of cycles without current (without releases)		N/A
	Applied voltage of closing mechanism (V)		N/A
	10% of total cycles for circuit-breaker with fitted shunt release: (50% at the beginning- and 50% at the end of the test.) Energized at the rated U_c		N/A
	Applied voltage: shunt releases (V)		N/A
	10% of total cycles for circuit-breaker with undervoltage releases: (50% at the beginning- and 50% at the end of the test.) Energized at the minimum rated U_c		N/A
	10 attempts to close the breaker without applied voltage at the undervoltage releases. (Shall not possible to close the circuit-breaker.)		N/A
	Applied voltage: undervoltage releases (V)		N/A
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.4.4	Operational performance capability with current.		—
	Rated current: I_n (A)	250A	—
	Maximum rated operational voltage: U_e (V)	400V	—
	Conductor cross-sectional area (mm^2) :	120 mm^2	P
	Number of operating cycles per hour	120	P
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)	1000	P
	Applied voltage: closing mechanism (V)		N/A

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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 $U/U_e = 1,0$ (V):	403V	P
	- test current $I/I_n = 1,0$ (A):	251.7A	P
	- power factor/time constant:	0.81	P
	- frequency: (Hz)	50Hz	P
	- on-time (ms):	See the oscillogram NO:SSA231303-#10-01~03	P
	- off-time (s):	30s	P
	In the case of circuit-breakers fitted with electrical or pneumatic closing devices, these devices shall be supplied at their rated control supply voltage or at their rated pressure.		N/A
	Precautions shall be taken to ensure that the temperature rises of the electrical components do not exceed the value indicated in tab. 7.		N/A
8.3.3.4.5	Additional test of operational performance capability without current for withdrawable circuit-breaker.		—
	Number of operations cycles : 100		N/A
	After test, the isolating contacts, withdrawable mechanism and interlocks shall be suitable for further service.		N/A
8.3.3.5	Overload performance		—
	this test applies to circuit-breaker of rated current up to and including 630 A		—
	Type designation or serial number		—
	Sample no:	#10	—
	Rated current I_n (A)	250A	—
	Rated operational voltage: U_e (V)	400V	—
	Rated control supply voltage of closing mechanism: U_c (V)		N/A
	Rated control supply voltage of shunt releases: U_c (V)		N/A
	Rated control supply voltage undervoltage releases: U_c (V)		N/A
	Ambient temperature 10-40 °C :	23.1°C	P
	Number of operating cycles per hour	120	P
	Maximum rated operational voltage: U_e (V)	400V	P
	Number of operating cycles per hour		N/A
	Number of cycles with current (total) (closing mechanism energized at the rated U_c)		N/A
	Applied voltage: closing mechanism (V)		N/A

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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.		N/A
	Conditions, overload operations:		—
	- test voltage: $U/U_e = 1,05$ (V)	428V	P
	- test current AC/DC: $I/I_n = 6,0/2.5$ (A)	1508A	P
	- power factor/time constant:	0.51	P
	- Number of cycles manually opened: 9	9	P
	- Number of cycles automatically opened by an overload release: 3	3	P
	for circuit-breakers having a short-circuit release of a maximum setting less than the test current		—
	all 12 operations automatic		N/A
	If the testing means do not withstand the let-through energy occurring during the automatic operation		—
	– 12 manual operations – three additional operations with automatic opening, made at any convenient voltage		N/A
	- frequency: (Hz)	50Hz	P
	- on-time max 2s:	See the oscillogram NO:SFA231303-#10-01~06	P
	Operating rate if different from Table 8		N/A
8.3.3.6	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V for 5 seconds	1002V/5s	P
	- no breakdown or flashover		P
	For circuit-breaker suitable for isolation, the leakage current shall be measured through each pole with the contacts in the open position, at a test voltage of $1,1 U_e$, and shall not exceed 2 mA.	L1:440V,0.015mA L2:440V,0.016mA L3:440V,0.015mA	P
8.3.3.7	Verification of temperature-rise		—
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals ≤ 80 K (K) :	74.7K	P
	conductor cross-sectional area (mm ²) :	120 mm ² × 2m	P
	test current I_e (A) :	250.2A	P
8.3.3.8	Verification of overload releases		—
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	363.1A	P
	Conventional tripping time: <1h when $I_n < 63A$, <2h when $I_n > 63 A$	5min3s	P
8.3.3.10	Verification of the main contact position for circuit-breakers for isolation		—

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Clause	Requirement + Test	Result - Remark	Verdict
	actuating force for opening (N)	72.6N	P
	test force with blocked main contacts for 10 s (N) .	150N	P
	Dependent power operation		N/A
	Supply voltage of 110% of rated voltage (V).....:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	Independent power operation		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.4	TEST SEQUENCE II		—
	Type designation or serial number:	/	—
	Sample no:	#2	—
	Rated current: In (A)	150A	—
	Rated operational voltage: Ue (V)	400V	—
8.3.4.2	Test of rated service short-circuit breaking capacity		—
	Test sequence of operation: O – t – CO – t – CO		—
	Rated service short-circuit breaking capacity: (kA)	10kA	—
	Rated control supply voltage of closing mechanism: Uc (V)		—
	Rated control supply voltage of shunt release: Uc (V)		—
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star	P
	Conductor cross-sectional area: (mm ²)	50mm ²	P

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Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques:(Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO – t – CO		—
	- test voltage U: 1.05Ue(V)	428V	P
	- r.m.s. test current AC:(kA)	10.1kA	P
	power factor/time constant:	0.49	P
	- Factor "n"	1.7	P
	- peak test current: (kA)	17.4kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#2-01	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#2-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#2-02	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#2-02	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#2-03	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#2-03	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.4.3	Operational performance capability with current.		—
	Rated current: I _n (A)	150A	—
	Maximum rated operational voltage: U _e (V)	400V	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm ²) :	50mm ²	—
	Number of operating cycles per hour	120	—
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50	—
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		—
	- test voltage U/U _e = 1,0 (V) :	403V	P
	- test current I/I _n = 1,0 (A):	151.2A	P
	- power factor/time constant:	0.81	P
	- frequency: (Hz)	50Hz	P
	- on-time (ms):	50ms	P
	- off-time (s):	30s	P
8.3.4.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 U _e)	L1:440V,0.016mA L2:440V,0.015mA L3:440V,0.016mA	P
8.3.4.5	Verification of temperature-rise		—
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	74.0K	P
	conductor cross-sectional area (mm ²) :	50mm ² × 2m	P
	test current I _n (A) :	150.8A	P
8.3.4.6	Verification of overload releases		—
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	217.5A	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	3min44s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.4	TEST SEQUENCE II		—
	Type designation or serial number:	/	—
	Sample no:	#3	—
	Rated current: In (A)	150A	—
	Rated operational voltage: Ue (V)	230V	—
8.3.4.2	Test of rated service short-circuit breaking capacity		—
	Test sequence of operation: O – t – CO – t – CO		—
	Rated service short-circuit breaking capacity: (kA)	18kA	—
	Rated control supply voltage of closing mechanism: Uc (V)		—
	Rated control supply voltage of shunt release: Uc (V)		—
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star	P
	Conductor cross-sectional area: (mm ²)	50mm ²	P

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Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques:(Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO – t – CO		—
	- test voltage U: 1.05Ue(V)	248V	P
	- r.m.s. test current AC:(kA)	18.2kA	P
	power factor/time constant:	0.29	P
	- Factor "n"	2.0	P
	- peak test current: (kA)	36.6kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#3-01	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#3-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#3-02	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#3-02	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#3-03	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#3-03	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.4.3	Operational performance capability with current.		—
	Rated current: I _n (A)	150A	—
	Maximum rated operational voltage: U _e (V)	230V	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm ²) :	50mm ²	—
	Number of operating cycles per hour	120	—
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50	—
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		—
	- test voltage U/U _e = 1,0 (V) :	231V	P
	- test current I/I _n = 1,0 (A):	151.4A	P
	- power factor/time constant:	0.81	P
	- frequency: (Hz)	50Hz	P
	- on-time (ms):	50ms	P
	- off-time (s):	30s	P
8.3.4.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 U _e)	L1:253V,0.016mA L2:253V,0.015mA L3:253V,0.017mA	P
8.3.4.5	Verification of temperature-rise		—
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	71.5K	P
	conductor cross-sectional area (mm ²) :	50mm ² × 2m	P
	test current I _n (A) :	150.8A	P
8.3.4.6	Verification of overload releases		—
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	217.8A	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	4min1s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.4	TEST SEQUENCE II		—
	Type designation or serial number:	/	—
	Sample no:	#4	—
	Rated current: In (A)	40A	—
	Rated operational voltage: Ue (V)	230V	—
8.3.4.2	Test of rated service short-circuit breaking capacity		—
	Test sequence of operation: O – t – CO – t – CO		—
	Rated service short-circuit breaking capacity: (kA)	18kA	—
	Rated control supply voltage of closing mechanism: Uc (V)		—
	Rated control supply voltage of shunt release: Uc (V)		—
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star	P
	Conductor cross-sectional area: (mm ²)	10mm ²	P

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Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques:(Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO – t – CO		—
	- test voltage U: 1.05Ue(V)	248V	P
	- r.m.s. test current AC:(kA)	18.2kA	P
	power factor/time constant:	0.29	P
	- Factor "n"	2.0	P
	- peak test current: (kA)	36.6kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#4-01	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#4-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#4-02	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#4-02	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#4-03	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#4-03	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.4.3	Operational performance capability with current.		N/A
	Rated current: I _n (A)		N/A
	Maximum rated operational voltage: U _e (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm ²) :		N/A
	Number of operating cycles per hour		N/A
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)		N/A
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		—
	- test voltage U/U _e = 1,0 (V) :		N/A
	- test current I/I _n = 1,0 (A):		N/A
	- power factor/time constant:		N/A
	- frequency: (Hz)		N/A
	- on-time (ms):		N/A
	- off-time (s):		N/A
8.3.4.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 U _e)	L1:253V,0.017mA L2:253V,0.016mA L3:253V,0.015mA	P
8.3.4.5	Verification of temperature-rise		N/A
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. ≤ 80 K (K) :		N/A
	conductor cross-sectional area (mm ²) :		N/A
	test current I _n (A) :		N/A
8.3.4.6	Verification of overload releases		—
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	58.2A	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	4min19s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.4	TEST SEQUENCE II		—
	Type designation or serial number:	/	—
	Sample no:	#11	—
	Rated current: In (A)	250A	—
	Rated operational voltage: Ue (V)	400V	—
8.3.4.2	Test of rated service short-circuit breaking capacity		—
	Test sequence of operation: O – t – CO – t – CO		—
	Rated service short-circuit breaking capacity: (kA)	15kA	—
	Rated control supply voltage of closing mechanism: Uc (V)		—
	Rated control supply voltage of shunt release: Uc (V)		—
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star	P
	Conductor cross-sectional area: (mm ²)	120mm ²	P

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Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques:(Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO – t – CO		—
	- test voltage U: 1.05Ue(V)	427V	P
	- r.m.s. test current AC:(kA)	15.5kA	P
	power factor/time constant:	0.29	P
	- Factor "n"	2.0	P
	- peak test current: (kA)	31.1kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#11-01	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#11-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#11-02	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#11-02	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#11-03	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#11-03	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.4.3	Operational performance capability with current.		—
	Rated current: I _n (A)	250A	—
	Maximum rated operational voltage: U _e (V)	400V	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm ²) :	120mm ²	—
	Number of operating cycles per hour	120	—
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50	—
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		—
	- test voltage U/U _e = 1,0 (V) :	403V	P
	- test current I/I _n = 1,0 (A):	252.2A	P
	- power factor/time constant:	0.81	P
	- frequency: (Hz)	50Hz	P
	- on-time (ms):	50ms	P
	- off-time (s):	30s	P
8.3.4.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 U _e)	L1:440V,0.016mA L2:440V,0.015mA L3:440V,0.016mA	P
8.3.4.5	Verification of temperature-rise		—
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	72.1K	P
	conductor cross-sectional area (mm ²) :	120mm ² × 2m	P
	test current I _n (A) :	250.2A	P
8.3.4.6	Verification of overload releases		—
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	362.7A	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	3min58s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.4	TEST SEQUENCE II		—
	Type designation or serial number:	/	—
	Sample no:	#12	—
	Rated current: In (A)	250A	—
	Rated operational voltage: Ue (V)	230V	—
8.3.4.2	Test of rated service short-circuit breaking capacity		—
	Test sequence of operation: O – t – CO – t – CO		—
	Rated service short-circuit breaking capacity: (kA)	20kA	—
	Rated control supply voltage of closing mechanism: Uc (V)		—
	Rated control supply voltage of shunt release: Uc (V)		—
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star	P
	Conductor cross-sectional area: (mm ²)	120mm ²	P

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Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques:(Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO – t – CO		—
	- test voltage U: 1.05Ue(V)	243V	P
	- r.m.s. test current AC:(kA)	20.4kA	P
	power factor/time constant:	0.28	P
	- Factor "n"	2.0	P
	- peak test current: (kA)	41.4kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#12-01	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#12-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#12-02	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#12-02	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#12-03	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#12-03	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.4.3	Operational performance capability with current.		—
	Rated current: I _n (A)	250A	—
	Maximum rated operational voltage: U _e (V)	230V	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm ²) :	120mm ²	—
	Number of operating cycles per hour	120	—
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)	50	—
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		—
	- test voltage U/U _e = 1,0 (V) :	232V	P
	- test current I/I _n = 1,0 (A):	251.6A	P
	- power factor/time constant:	0.81	P
	- frequency: (Hz)	50Hz	P
	- on-time (ms):	50ms	P
	- off-time (s):	30s	P
8.3.4.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 U _e)	L1:253V,0.016mA L2:253V,0.017mA L3:253V,0.015mA	P
8.3.4.5	Verification of temperature-rise		—
	- the values of temperature-rise do not exceed those specified in tab. 7.		P
	Temperature rise of main circuit terminals. ≤ 80 K (K) :	75.0K	P
	conductor cross-sectional area (mm ²) :	120mm ² × 2m	P
	test current I _n (A) :	250.8A	P
8.3.4.6	Verification of overload releases		—
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	363A	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	4min7s	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.4	TEST SEQUENCE II		—
	Type designation or serial number:	/	—
	Sample no:	#13	—
	Rated current: In (A)	125A	—
	Rated operational voltage: Ue (V)	230V	—
8.3.4.2	Test of rated service short-circuit breaking capacity		—
	Test sequence of operation: O – t – CO – t – CO		—
	Rated service short-circuit breaking capacity: (kA)	20kA	—
	Rated control supply voltage of closing mechanism: Uc (V)		—
	Rated control supply voltage of shunt release: Uc (V)		—
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star	P
	Conductor cross-sectional area: (mm ²)	50mm ²	P

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Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques:(Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO – t – CO		—
	- test voltage U: 1.05Ue(V)	243V	P
	- r.m.s. test current AC:(kA)	20.4kA	P
	power factor/time constant:	0.28	P
	- Factor "n"	2.0	P
	- peak test current: (kA)	41.4kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#13-01	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#13-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#13-02	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#13-02	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#13-03	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#13-03	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.4.3	Operational performance capability with current.		—
	Rated current: I _n (A)		N/A
	Maximum rated operational voltage: U _e (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductor cross-sectional area (mm ²) :		N/A
	Number of operating cycles per hour		N/A
	Number (5% of the number given in column 4, tab. 8) of cycles with current (total) (closing mechanism energized at the rated U _c)		N/A
	Applied voltage: closing mechanism (V)		N/A
	For circuit-breaker fitted with adjustable releases, test shall be made with the overload setting at maximum and short-circuit setting at minimum.		N/A
	Conditions, make/break operations:		—
	- test voltage U/U _e = 1,0 (V) :		N/A
	- test current I/I _n = 1,0 (A):		N/A
	- power factor/time constant:		N/A
	- frequency: (Hz)		N/A
	- on-time (ms):		N/A
	- off-time (s):		N/A
8.3.4.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		P
	- the leaking current for circuit-breaker suitable for isolation: (<2mA / 1.1 U _e)	L1:253V,0.016mA L2:253V,0.017mA L3:253V,0.016mA	P
8.3.4.5	Verification of temperature-rise		—
	- the values of temperature-rise do not exceed those specified in tab. 7.		N/A
	Temperature rise of main circuit terminals. ≤ 80 K (K) :		N/A
	conductor cross-sectional area (mm ²) :		N/A
	test current I _n (A) :		N/A
8.3.4.6	Verification of overload releases		—
	Test current: 1.45 times the value of their current setting at the reference temperature: (A)	181.6A	P
	Conventional tripping time: <1h when I _n < 63A, <2h when I _n > 63 A	4min49s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III:		—
	Type designation or serial number:	/	—
	Sample no:	#5	—
	Rated current: In (A)	150A	—
	Rated operational voltage: Ue (V)	400V	—
8.3.5.2	Verification of overload releases		—
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s)	L1: 222s	P
	L2: 140s	
	L3: 187s	
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		—
	The test sequence of operations is O – t – CO		—
	Rated ultimate short-circuit breaking capacity: (kA)	15kA	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star point	P
	Conductor cross-sectional area: (mm ²)	50mm ²	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO		
	- test voltage $U=1.05U_e$ (V)	427V	P
	- r.m.s. test current AC: (kA)	15.5kA	P
	- ratio hole area/total area: 0.30-0.25	0.29	P
	- Factor "n"	2.0	P
	- peak test current: (kA)	31.1kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#5-01	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.: SFA231303-#5-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#5-02	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.:SFA231303-#5-02	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.5.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1.1 Ue)	L1:440V,0.017mA L2:440V,0.018mA L3:440V,0.019mA	
8.3.5.5	Verification of overload releases		—
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s) L1: L2: L3: N :	282s 253s 277s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III:		—
	Type designation or serial number:	/	—
	Sample no:	#6	—
	Rated current: In (A)	150A	—
	Rated operational voltage: Ue (V)	230V	—
8.3.5.2	Verification of overload releases		—
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s)	L1: 235s L2: 180s L3: 111s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		—
	The test sequence of operations is O – t – CO		—
	Rated ultimate short-circuit breaking capacity: (kA)	25kA	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	conductive plating	P
	Test made in specified individual enclosure: Details of these tests, including the dimensions of the enclosure:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fuse "F": copper wire: diameter 0.8 mm, 50 mm long		P
	Circuit is earthed at: (load-star- or supply-star point)	supply-star point	P
	Conductor cross-sectional area: (mm ²)	50mm ²	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO		
	- test voltage U=1.05U _e (V)	246V	P
	- r.m.s. test current AC: (kA)	25.7kA	P
	- ratio hole area/total area: 0.25-0.20	0.23	P
	- Factor "n"	2.1	P
	- peak test current: (kA)	53.4kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#6-01	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.: SFA231303-#6-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#6-02	P
	- Joule integral I ² dt: (A ² s)	See the oscillogram No.:SFA231303-#6-02	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.5.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1.1 Ue)	L1:254V,0.120mA L2:254V,0.314mA L3:254V,0.612mA	
8.3.5.5	Verification of overload releases		—
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s) L1: L2: L3: N :	346s 101s 229s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III:		—
	Type designation or serial number:	/	—
	Sample no:	#7	—
	Rated current: In (A)	40A	—
	Rated operational voltage: Ue (V)	230V	—
8.3.5.2	Verification of overload releases		—
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s)	L1: 222s L2: 148s L3: 131s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		—
	The test sequence of operations is O – t – CO		—
	Rated ultimate short-circuit breaking capacity: (kA)	25kA	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star point	P
	Conductor cross-sectional area: (mm ²)	10mm ²	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO		
	- test voltage $U=1.05U_e$ (V)	246V	P
	- r.m.s. test current AC: (kA)	25.7kA	P
	- ratio hole area/total area: 0.25-0.20	0.23	P
	- Factor "n"	2.1	P
	- peak test current: (kA)	53.4kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#7-01	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.: SFA231303-#7-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#7-02	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.:SFA231303-#7-02	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.5.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1.1 Ue)	L1:253V,0.017mA L2:253V,0.016mA L3:253V,0.018mA	
8.3.5.5	Verification of overload releases		—
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s) L1: L2: L3: N :	98s 88s 91s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III:		—
	Type designation or serial number:	/	—
	Sample no:	#14	—
	Rated current: In (A)	250A	—
	Rated operational voltage: Ue (V)	400V	—
8.3.5.2	Verification of overload releases		—
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s)	L1: 232s L2: 189s L3: 176s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		—
	The test sequence of operations is O – t – CO		—
	Rated ultimate short-circuit breaking capacity: (kA)	20kA	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star point	P
	Conductor cross-sectional area: (mm ²)	120mm ²	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO		
	- test voltage $U=1.05U_e$ (V)	428V	P
	- r.m.s. test current AC: (kA)	20.6kA	P
	- ratio hole area/total area: 0.30-0.25	0.27	P
	- Factor "n"	2.0	P
	- peak test current: (kA)	41.4kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#14-01	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.: SFA231303-#14-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#14-02	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.:SFA231303-#14-02	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.5.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1.1 Ue)	L1:440V,0.017mA L2:440V,0.021mA L3:440V,0.018mA	
8.3.5.5	Verification of overload releases		—
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s) L1: L2: L3: N :	84s 79s 80s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III:		—
	Type designation or serial number:	/	—
	Sample no:	#15	—
	Rated current: In (A)	250A	—
	Rated operational voltage: Ue (V)	230V	—
8.3.5.2	Verification of overload releases		—
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s)	L1: 151s L2: 145s L3: 162s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		—
	The test sequence of operations is O – t – CO		—
	Rated ultimate short-circuit breaking capacity: (kA)	25kA	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star point	P
	Conductor cross-sectional area: (mm ²)	120mm ²	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO		
	- test voltage $U=1.05U_e$ (V)	246V	P
	- r.m.s. test current AC: (kA)	25.7kA	P
	- ratio hole area/total area: 0.25-0.20	0.23	P
	- Factor "n"	2.1	P
	- peak test current: (kA)	53.4kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#15-01	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.: SFA231303-#15-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#15-02	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.:SFA231303-#15-02	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.5.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1.1 Ue)	L1:254V,0.082mA L2:254V,0.017mA L3:254V,0.008mA	
8.3.5.5	Verification of overload releases		—
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s) L1: L2: L3: N :	62.3s 78.4s 69.5s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III:		—
	Type designation or serial number:	/	—
	Sample no:	#16	—
	Rated current: In (A)	125A	—
	Rated operational voltage: Ue (V)	230V	—
8.3.5.2	Verification of overload releases		—
	The operation of overload releases shall be verified at twice the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s)	L1: 308s L2: 240s L3: 95s	P
8.3.5.3	Test of rated ultimate short-circuit breaking capacity		—
	The test sequence of operations is O – t – CO		—
	Rated ultimate short-circuit breaking capacity: (kA)	25kA	P
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back: 100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star point	P
	Conductor cross-sectional area: (mm ²)	50mm ²	P
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening, torques: (Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO		
	- test voltage $U=1.05U_e$ (V)	246V	P
	- r.m.s. test current AC: (kA)	25.7kA	P
	- ratio hole area/total area: 0.25-0.20	0.23	P
	- Factor "n"	2.1	P
	- peak test current: (kA)	53.4kA	P
	Test sequence "O"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#16-01	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.: SFA231303-#16-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO"		—
	- max. let-through current: (kA _{peak})	See the oscillogram No.: SFA231303-#16-02	P
	- Joule integral I^2dt : (A ² s)	See the oscillogram No.:SFA231303-#16-02	P
	The circuit-breaker should be no excessive damage		P
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
8.3.5.4	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V, 5s	P
	- no breakdown or flashover		

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1.1 Ue)	L1:254V,0.005mA L2:254V,0.006mA L3:254V,0.019mA	
8.3.5.5	Verification of overload releases		—
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P
	- Operation time: (s) L1: L2: L3: N :	72s 75s 83s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
H.2	Test of individual pole short-circuit breaking capacity		—
	Type designation or serial number	/	—
	Sample no:	#8	—
	Rated current: In (A)	150A	—
	Rated operational voltage: Ue (V)	400V	—
	Rated ultimate short-circuit breaking capacity: (kA)	1.8kA	—
	Rated control supply voltage of closing mechanism: Uc (V)		—
	Rated control supply voltage of shunt release: Uc (V)		—
	The test sequence of operations is O – t - CO		—
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back:100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star	P
	Conductor cross-sectional area (mm ²):	50mm ²	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO		P
	Test circuit according figure: 9		P
	- test voltage $U/U_e = 1,05$ (V) :	427V	P
	- r.m.s. test current AC/DC: (A)	1.88kA	P
	power factor/time constant:	0.85	P
	- Factor "n"	1.42	P
	- peak test current (A_{max}) :	2.65kA	P
	Test sequence "O" L1		—
	- max. let-through current: (kA_{peak}) L1:	See the oscillogram No.: SFA231303-#8-01	P
	- Joule integral I^2dt (A^2s) L1:	See the oscillogram No.: SFA231303-#8-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO" L1		—
	- max. let-through current: (kA_{peak}) L1:	See the oscillogram No.: SFA231303-#8-02	P
	- Joule integral I^2dt (A^2s) L1:	See the oscillogram No.: SFA231303-#8-02	P
	Test sequence "O" L2		—
	- max. let-through current: (kA_{peak}) L2:	See the oscillogram No.: SFA231303-#8-03	P
	- Joule integral I^2dt (A^2s) L2:	See the oscillogram No.: SFA231303-#8-03	P
	Pause, t: (min)	3min	P
	Test sequence "CO" L2		—
	- max. let-through current: (kA_{peak}) L2:	See the oscillogram No.: SFA231303-#8-04	P
	- Joule integral I^2dt (A^2s) L2:	See the oscillogram No.: SFA231303-#8-04	P
	Test sequence "O" L3		—
	- max. let-through current: (kA_{peak}) L3:	See the oscillogram No.: SFA231303-#8-05	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Joule integral I^2dt (A ² s) L3:	See the oscillogram No.: SFA231303-#8-05	P
	Pause, t: (min)	3min	P
	Test sequence "CO" L3		—
	- max. let-through current: (kA _{peak}) L3:	See the oscillogram No.: SFA231303-#8-06	P
	- Joule integral I^2dt (A ² s) L3:	See the oscillogram No.: SFA231303-#8-06	P
	For 4-pole circuit-breakers with a protected neutral pole, the test voltage for that pole shall be phase-to-phase voltage divided by $\sqrt{3}$. This test is applicable only where the construction of the protected neutral pole differs from that of the phase poles.		N/A
	Test sequence "O" N		—
	- max. let-through current: (kA _{peak}) N:		N/A
	- Joule integral I^2dt (A ² s) N:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO" N		—
	- max. let-through current: (kA _{peak}) N:		N/A
	- Joule integral I^2dt (A ² s) N:		N/A
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
H.3	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V,5s	
	- no breakdown or flashover		
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1.1 U _e)	L1:440V,0.007mA L2:440V,0.006mA L3:440V,0.005mA	P
H.4	Verification of overload releases		—
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) L1: L2: L3: N :	149s 58s 70s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
H.2	Test of individual pole short-circuit breaking capacity		—
	Type designation or serial number	/	—
	Sample no:	#17	—
	Rated current: In (A)	250A	—
	Rated operational voltage: Ue (V)	400V	—
	Rated ultimate short-circuit breaking capacity: (kA)	3kA	—
	Rated control supply voltage of closing mechanism: Uc (V)		—
	Rated control supply voltage of shunt release: Uc (V)		—
	The test sequence of operations is O – t - CO		—
	For circuit-breaker fitted with adjustable releases, test shall be made with the current and time settings at maximum.		N/A
	closing mechanism energized with 85% at the rated Uc: (V)		N/A
	The circuit-breaker is mounted complete on its own support or an equivalent support.		P
	Test made in free air:		P
	Distances of the metallic screen's: (all sides)	up and down: / mm left and right: / mm front and back:100/0 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	0.50	P
	- size of hole: <30mm ²	29mm ²	P
	- finish: bare or conductive plating	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)	supply-star	P
	Conductor cross-sectional area (mm ²):	120mm ²	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If terminals unmarked: line connected at: (underside/upside)		N/A
	Tightening torques: (Nm)	6.0Nm	P
	Test sequence of operation: O – t – CO		P
	Test circuit according figure: 9		P
	- test voltage $U/U_e = 1,05$ (V) :	428V	P
	- r.m.s. test current AC/DC: (A)	3.13kA	P
	power factor/time constant:	0.89	P
	- Factor "n"	1.42	P
	- peak test current (A_{max}) :	4.49kA	P
	Test sequence "O" L1		—
	- max. let-through current: (kA_{peak}) L1:	See the oscillogram No.: SFA231303-#17-01	P
	- Joule integral I^2dt (A^2s) L1:	See the oscillogram No.: SFA231303-#17-01	P
	Pause, t: (min)	3min	P
	Test sequence "CO" L1		—
	- max. let-through current: (kA_{peak}) L1:	See the oscillogram No.: SFA231303-#17-02	P
	- Joule integral I^2dt (A^2s) L1:	See the oscillogram No.: SFA231303-#17-02	P
	Test sequence "O" L2		—
	- max. let-through current: (kA_{peak}) L2:	See the oscillogram No.: SFA231303-#17-03	P
	- Joule integral I^2dt (A^2s) L2:	See the oscillogram No.: SFA231303-#17-03	P
	Pause, t: (min)	3min	P
	Test sequence "CO" L2		—
	- max. let-through current: (kA_{peak}) L2:	See the oscillogram No.: SFA231303-#17-04	P
	- Joule integral I^2dt (A^2s) L2:	See the oscillogram No.: SFA231303-#17-04	P
	Test sequence "O" L3		—
	- max. let-through current: (kA_{peak}) L3:	See the oscillogram No.: SFA231303-#17-05	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Joule integral I^2dt (A ² s) L3:	See the oscillogram No.: SFA231303-#17-05	P
	Pause, t: (min)	3min	P
	Test sequence "CO" L3		—
	- max. let-through current: (kA _{peak}) L3:	See the oscillogram No.: SFA231303-#17-06	P
	- Joule integral I^2dt (A ² s) L3:	See the oscillogram No.: SFA231303-#17-06	P
	For 4-pole circuit-breakers with a protected neutral pole, the test voltage for that pole shall be phase-to-phase voltage divided by $\sqrt{3}$. This test is applicable only where the construction of the protected neutral pole differs from that of the phase poles.		N/A
	Test sequence "O" N		—
	- max. let-through current: (kA _{peak}) N:		N/A
	- Joule integral I^2dt (A ² s) N:		N/A
	Pause, t: (min)		N/A
	Test sequence "CO" N		—
	- max. let-through current: (kA _{peak}) N:		N/A
	- Joule integral I^2dt (A ² s) N:		N/A
	Melting of the fusible element		P
	Damage to insulation on conductors		P
	Holes in the PE-sheet for test sequence "O"		P
	Cracks observed		P
H.3	Verification of dielectric withstand		—
	- equal to twice the rated operational voltage with a minimum of 1000 V	1002V,5s	
	- no breakdown or flashover		
	- the leaking current for circuit-breaker suitable for isolation: (<6mA / 1.1 U _e)	L1:440V,0.006mA L2:440V,0.004mA L3:440V,0.006mA	P
H.4	Verification of overload releases		—
	The operation of overload releases shall be verified at 2,5 times the value of their current setting on each pole separately.		—
	The operating time shall not exceed the max. value stated by the manufacturer for twice the current setting at the reference temperature, on a pole singly.		—
	Time specified by the manufacturer:	600s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Operation time: (s) L1: L2: L3: N :	180s 79s 124s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
IEC60947-1	Mechanical properties of terminals		—
9.2.5.2	Mechanical strength of terminals		—
	Type designation or serial number	/	—
	Sample no:	#9	—
	maximum cross-sectional area of conductor (mm ²) :	50mm ²	—
	diameter of thread (mm) :	7.82mm	—
	torque (Nm) :	6.0N.m	—
	5 times on 2 separate clamping units		P
IEC60947-1	Clearances and creepage distances:		—
8.1.4	For circuit-breakers for which the manufacturer has declared a value of rated impulse withstand voltage. (Uimp.)		—
	Clearances distances:		—
	- Uimp is given as:	5kV	—
	- pollution degree:	3	—
	- minimum clearances (mm):	5.5mm	—
	- measured clearances (mm):	14.4mm	P
	Creepage distances:		—
	- rated insulation voltage Ui (V)	690V	—
	- pollution degree	3	—
	- material group	IIIa	—
	- minimum creepage distances (mm)	10mm	—
	- measured creepage distances (mm)	19.4mm	P
IEC60947-1	Glow wire testing		—
8.1.2.2	Insulating components that support or fix current carrying components:	Base	—
	Test temperature:	960°C	P
	Test time:	30s	P
	Insulation components that do not support current carrying and grounding components:	Moulded case	—
	Test temperature:	650°C	P
	Test time:	30s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	There should be no flame or no heat, or the flame should extinguish within 30s after the hot wire is removed; The bottom layer of silk paper should not ignite.		P

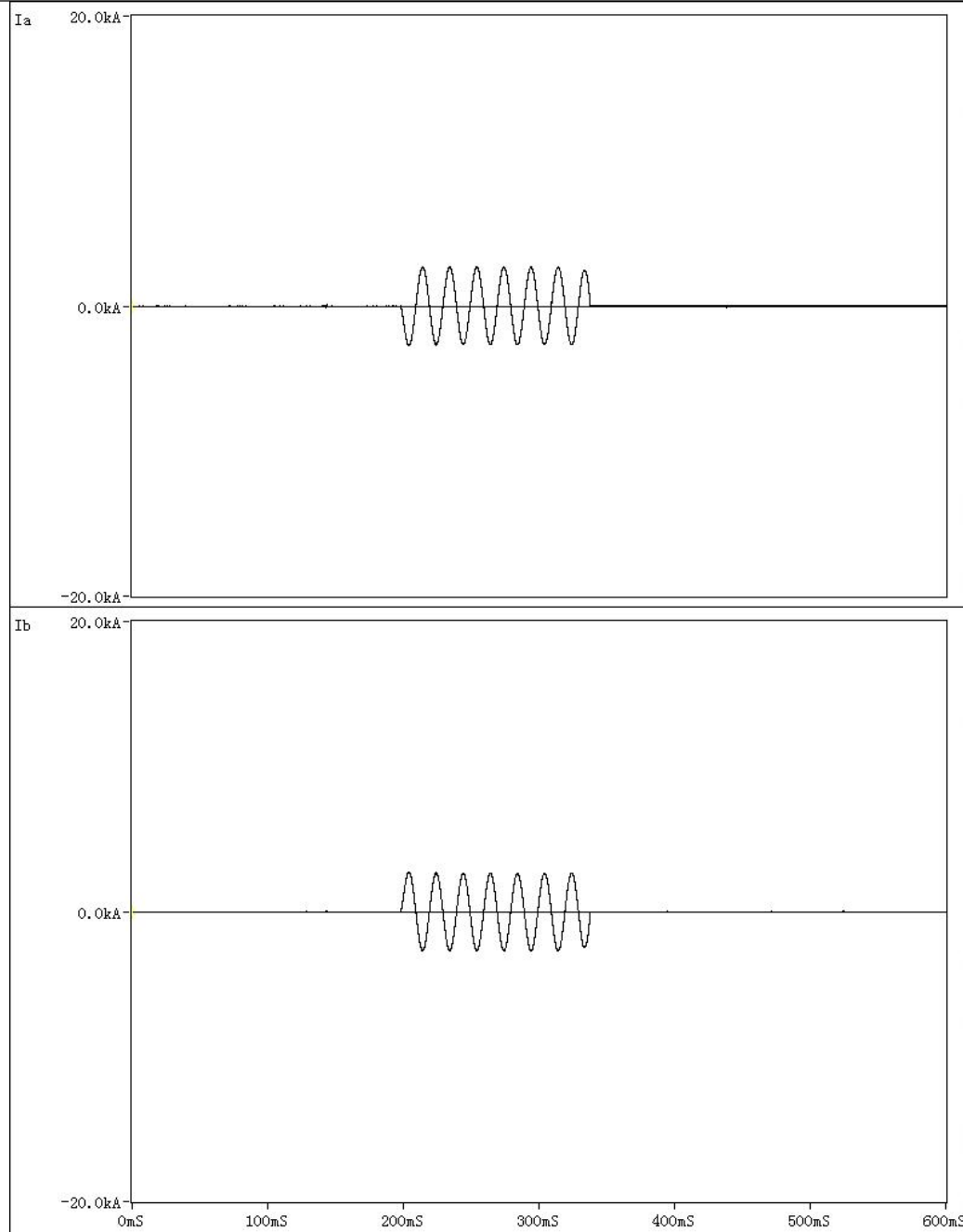
IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
IEC60947-1	Mechanical properties of terminals		—
9.2.5.2	Mechanical strength of terminals		—
	Type designation or serial number	/	—
	Sample no:	#18	—
	maximum cross-sectional area of conductor (mm ²) :	120mm ²	—
	diameter of thread (mm) :	7.81mm	—
	torque (Nm) :	6.0N.m	—
	5 times on 2 separate clamping units		P
IEC60947-1	Clearances and creepage distances:		—
8.1.4	For circuit-breakers for which the manufacturer has declared a value of rated impulse withstand voltage. (Uimp.)		—
	Clearances distances:		—
	- Uimp is given as:	5kV	—
	- pollution degree:	3	—
	- minimum clearances (mm):	5.5mm	—
	- measured clearances (mm):	15.6mm	P
	Creepage distances:		—
	- rated insulation voltage Ui (V)	690V	—
	- pollution degree	3	—
	- material group	IIIa	—
	- minimum creepage distances (mm)	10mm	—
	- measured creepage distances (mm)	20.9mm	P
IEC60947-1	Glow wire testing		—
8.1.2.2	Insulating components that support or fix current carrying components:	Base	—
	Test temperature:	960°C	P
	Test time:	30s	P
	Insulation components that do not support current carrying and grounding components:	Moulded case	—
	Test temperature:	650°C	P
	Test time:	30s	P

IEC 60947-2			
Clause	Requirement + Test	Result - Remark	Verdict
	There should be no flame or no heat, or the flame should extinguish within 30s after the hot wire is removed; The bottom layer of silk paper should not ignite.		P

IEC 60947-2

Calibration current oscillogram

Oscillogram No.: CA100-23-211



$U_{AB}=427.1V$
 $I_A=1.878kA$
 $I_B=1.878kA$
 $I_{avg}=1.878kA$
 $I_p A=2.651kA$
 $I_p B=2.651kA$
 $I_{pmax}=2.651kA$
 $\cos A=0.854$
 $\cos B=0.854$
 $\cos \phi_{avg}=0.854$

U_t : 试验电压test voltage

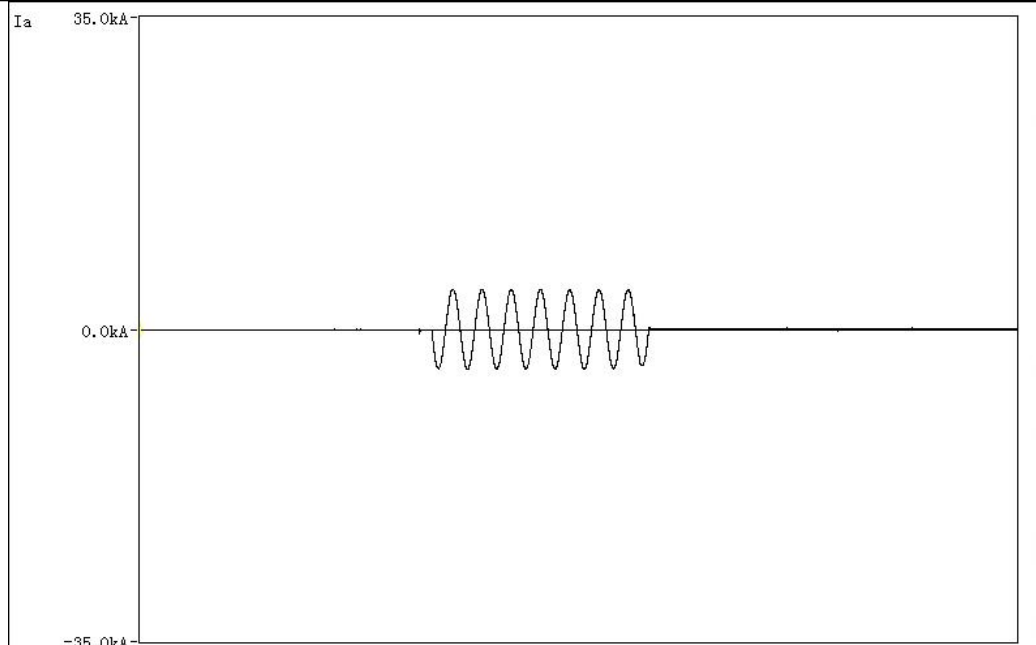
I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor

I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{rac} : 燃弧时间arcing time

IEC 60947-2

Calibration current oscillogram

Oscillogram No.: CA100-23-104



$U_{AB}=428.2V$

$I_A=3.125kA$

$I_B=3.125kA$

$I_{avg}=3.125kA$

$I_p A=4.494kA$

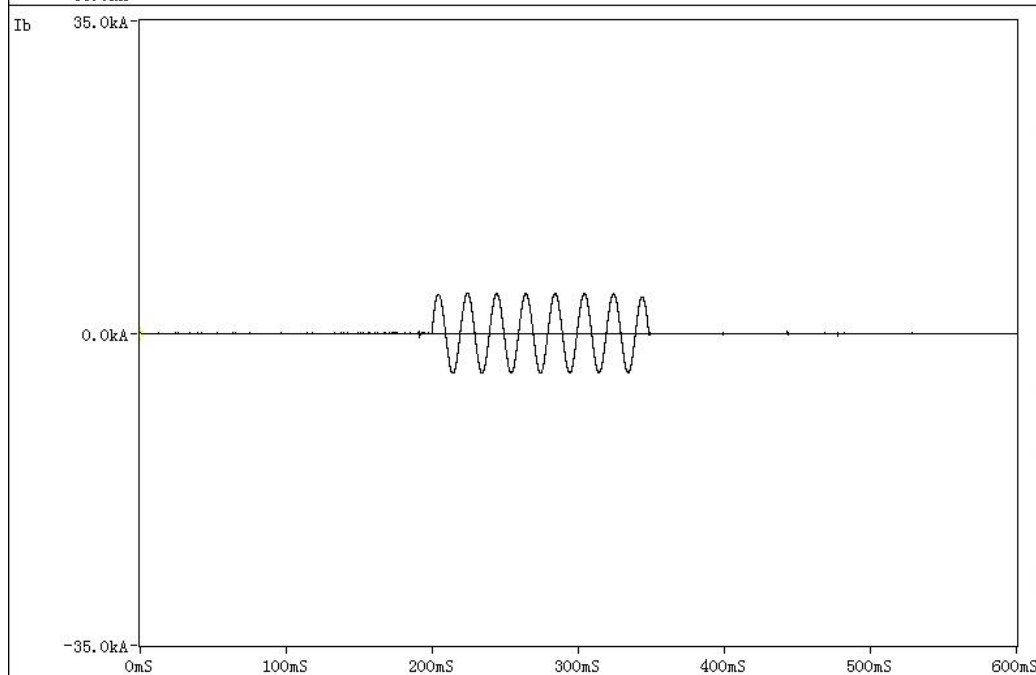
$I_p B=4.494kA$

$I_{pmax}=4.494kA$

$\cos A=0.888$

$\cos B=0.888$

$\cos \varphi_{avg}=0.888$



U_t : 试验电压test voltage

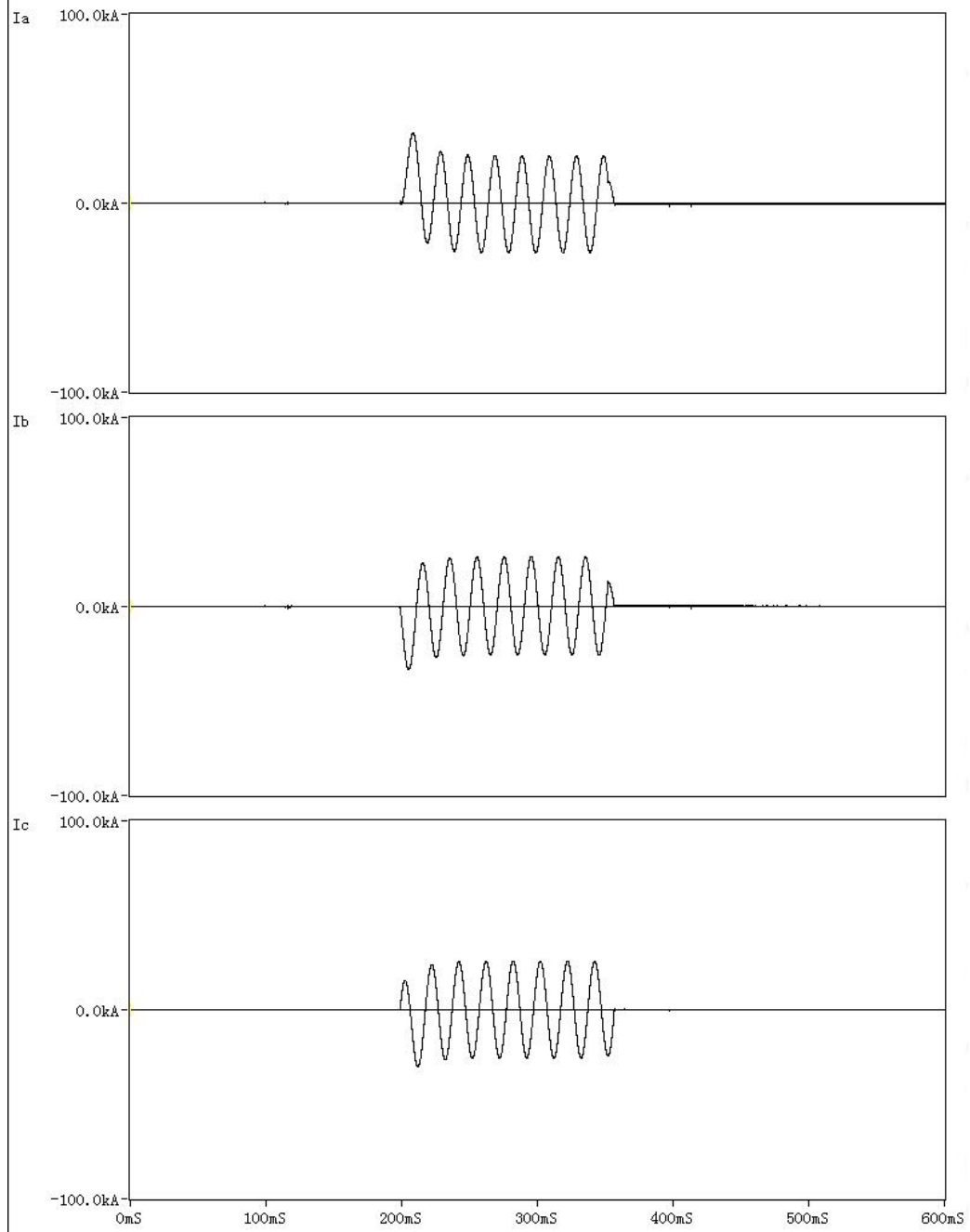
I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor

I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{rac} : 燃弧时间arcing time

IEC 60947-2

Calibration current oscillogram

Oscillogram No.: CA100-24-025



$U_{AB}=248.0V$
 $U_{BC}=247.2V$
 $U_{CA}=249.5V$
 $U_{avg}=248.2V$

 $I_A=18.15kA$
 $I_B=18.24kA$
 $I_C=18.17kA$
 $I_{avg}=18.19kA$

 $I_{pA}=36.57kA$
 $I_{pB}=32.45kA$
 $I_{pC}=31.15kA$
 $I_{pmax}=36.57kA$

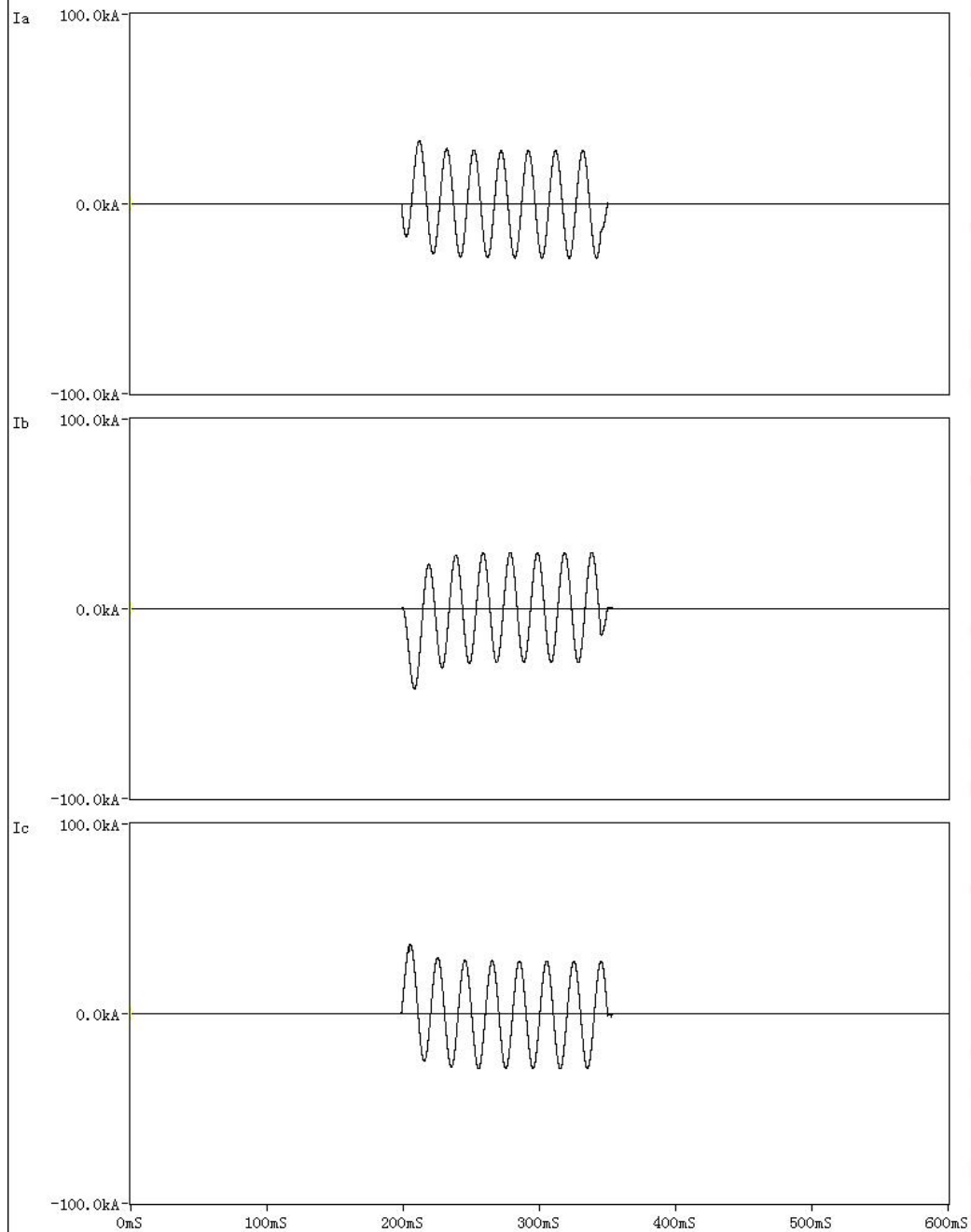
 $\cos A=0.297$
 $\cos B=0.290$
 $\cos C=0.282$
 $\cos \phi_{avg}=0.290$

U_t : 试验电压test voltage $I_A I_B I_C$: A B C三相电流有效值A B C phase current
 I_{avg} : 电流平均值average current I_{pmax} : 电流最大峰值max peak current
 $\cos \phi$: 功率因数power factor $\cos \phi_{avg}$: 功率因数平均值 average power factor

IEC 60947-2

Calibration current oscillogram

Oscillogram No.: CA100-24-024



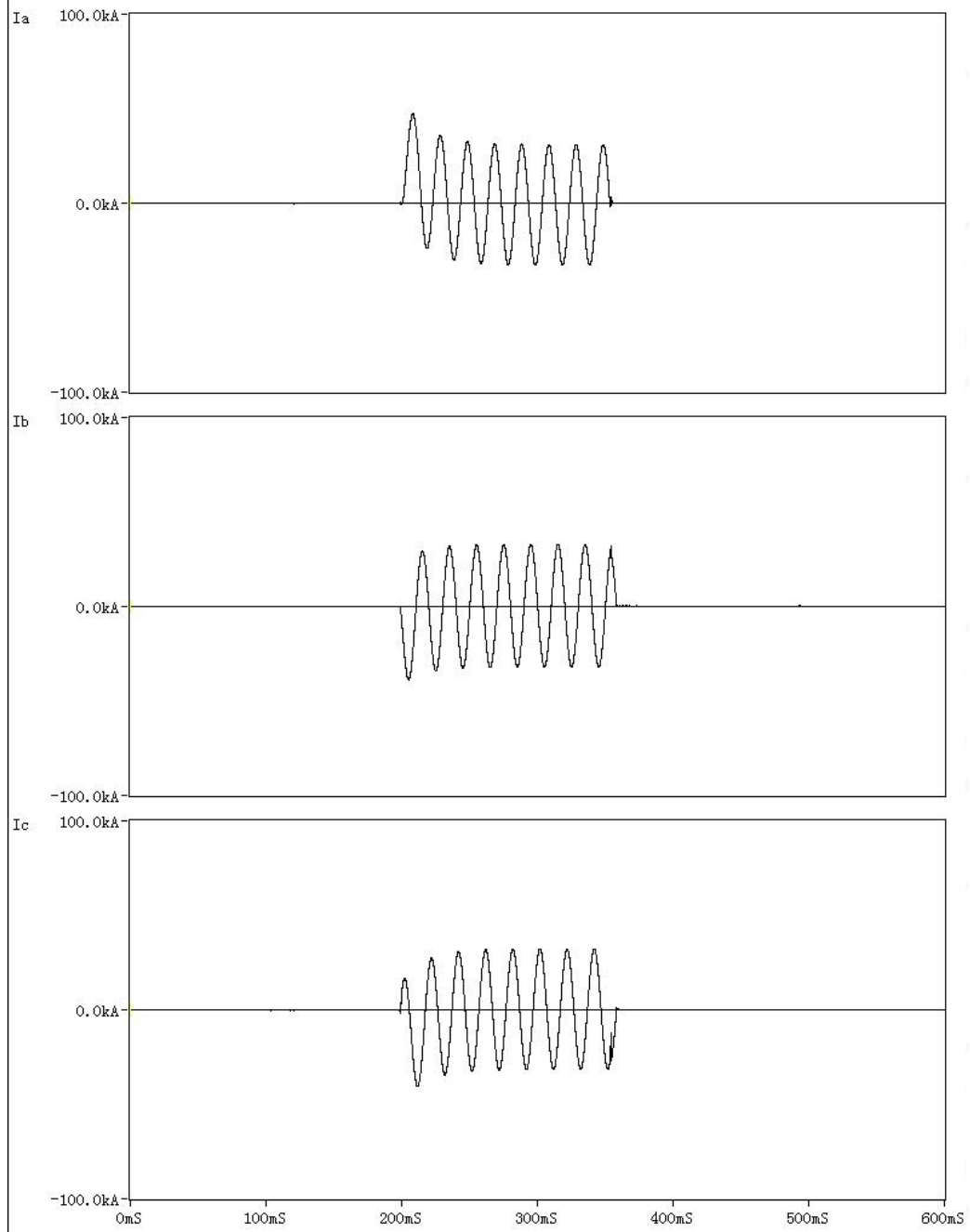
$U_{AB}=243.2V$
 $U_{BC}=242.3V$
 $U_{CA}=242.6V$
 $U_{\text{avg}}=242.7V$
 $I_A=20.28kA$
 $I_B=20.47kA$
 $I_C=20.31kA$
 $I_{\text{avg}}=20.35kA$
 $I_{pA}=41.44kA$
 $I_{pB}=40.23kA$
 $I_{pC}=39.72kA$
 $I_{p\text{max}}=41.44kA$
 $\text{Cos}A=0.278$
 $\text{Cos}B=0.265$
 $\text{Cos}C=0.282$
 $\text{Cos}\varphi_{\text{avg}}=0.275$

U_t : 试验电压test voltage $I_A I_B I_C$: A B C三相电流有效值A B C phase prospective current
 I_{avg} : 预期波电流平均值average current $I_{p\text{max}}$: 电流最大峰值max peak current
 $\text{cos}\varphi$: 功率因数power factor $\text{Cos}\varphi_{\text{avg}}$: 功率因数平均值 average power factor

IEC 60947-2

Calibration current oscillogram

Oscillogram No.: CA100-24-023



$U_{AB}=246.1V$
 $U_{BC}=245.0V$
 $U_{CA}=247.6V$
 $U_{tavg}=246.2V$

 $I_A=25.54kA$
 $I_B=25.96kA$
 $I_C=25.58kA$
 $I_{avg}=25.69kA$

 $I_{pA}=42.65kA$
 $I_{pB}=40.78kA$
 $I_{pC}=53.44kA$
 $I_{pmax}=53.44kA$

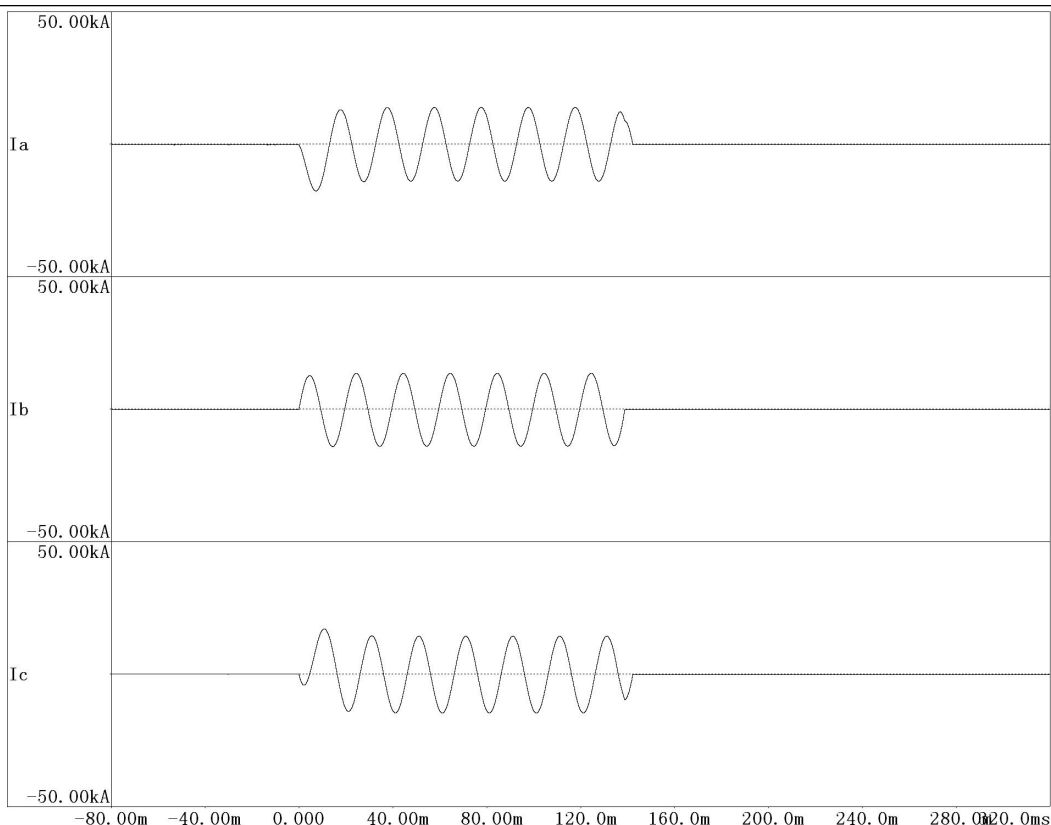
 $\cos A=0.235$
 $\cos B=0.234$
 $\cos C=0.227$
 $\cos \varphi_{avg}=0.232$

U_t : 试验电压test voltage $I_A I_B I_C$: A B C三相电流有效值A B C phase current
 I_{avg} : 电流平均值average current I_{pmax} : 电流最大峰值max peak current
 $\cos \varphi$: 功率因数power factor $\cos \varphi_{avg}$: 功率因数平均值 average power factor

IEC 60947-2

Calibration current oscillogram

Oscillogram No.: CA100-24-002



$U_{AB}=427.6V$
 $U_{BC}=428.5V$
 $U_{CA}=427.9V$
 $U_{tavg}=428.0V$
 $I_A=10.11kA$
 $I_B=10.13kA$
 $I_C=10.14kA$
 $I_{avg}=10.13kA$
 $I_{pA}=17.36kA$
 $I_{pB}=17.11kA$
 $I_{pC}=15.24kA$
 $I_{pmax}=17.36kA$
 $\cos A=0.495$
 $\cos B=0.493$
 $\cos C=0.491$
 $\cos \phi_{avg}=0.493$

U_t: 试验电压test voltage

I_A I_B I_C: A B C三相电流有效值A B C phase current

I_{avg}: 电流平均值average current

I_{pmax}: 电流最大峰值max peak current

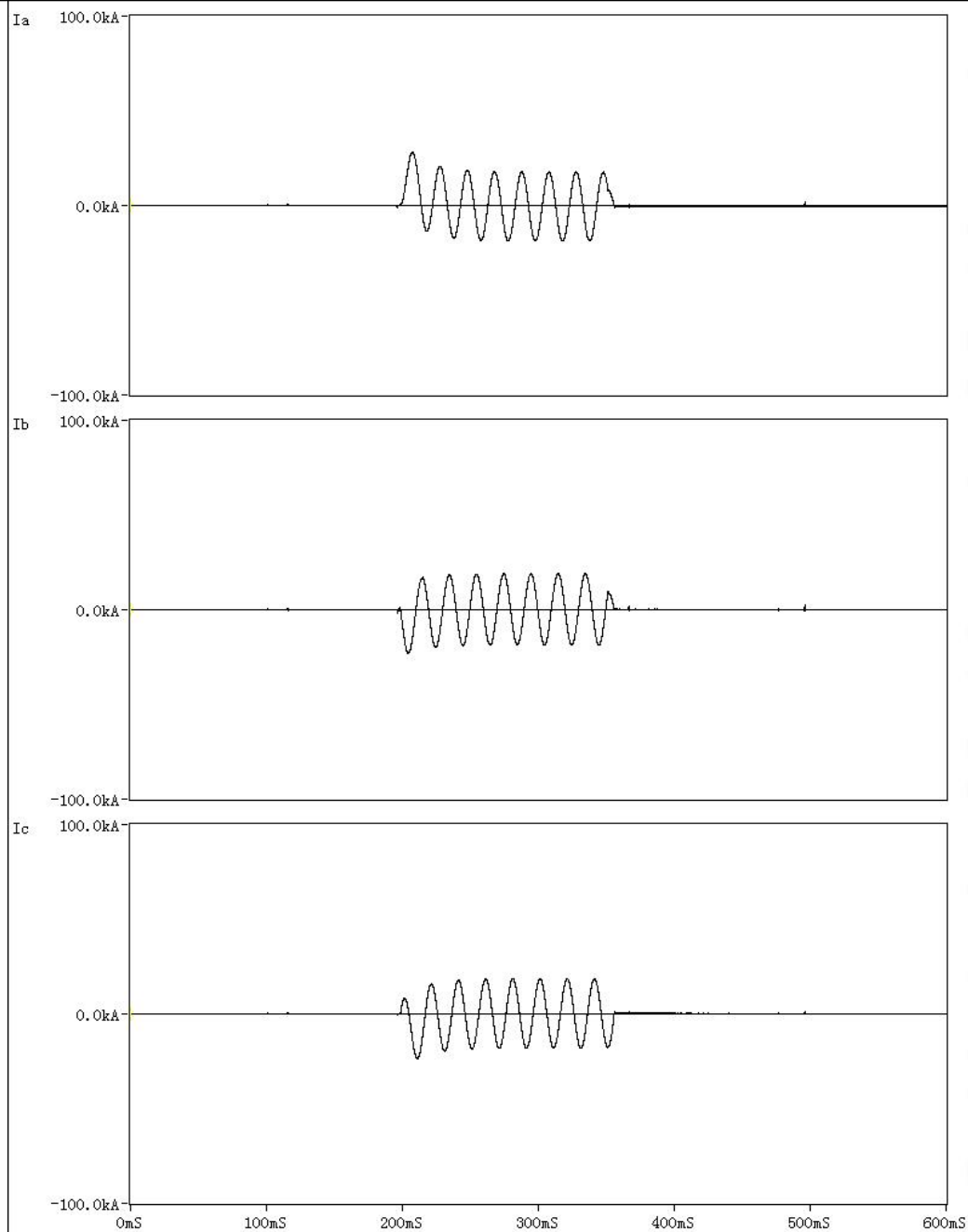
cosφ: 功率因数power factor

Cosφ_{avg}: 功率因数平均值 average power factor

IEC 60947-2

Calibration current oscillogram

Oscillogram No.: CA100-24-005



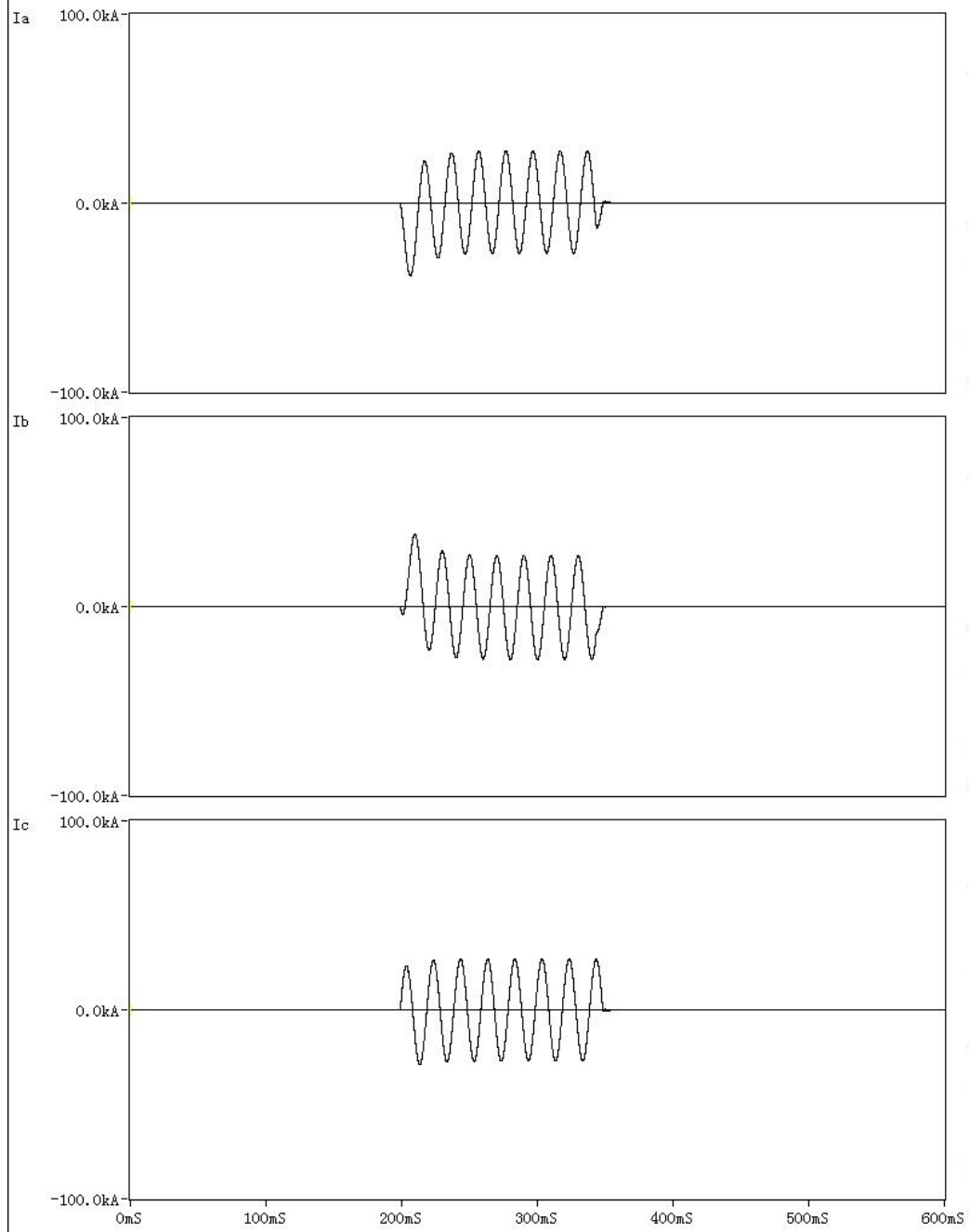
$U_{AB}=426.2V$
 $U_{BC}=427.6V$
 $U_{CA}=428.5V$
 $U_{tavg}=427.4V$
 $I_A=15.53kA$
 $I_B=15.51kA$
 $I_C=15.57kA$
 $I_{avg}=15.54kA$
 $I_{pA}=31.08kA$
 $I_{pB}=23.57kA$
 $I_{pC}=28.91kA$
 $I_{pmax}=31.08kA$
 $\cos A=0.295$
 $\cos B=0.285$
 $\cos C=0.277$
 $\cos \phi_{avg}=0.286$

 U_t : 试验电压test voltage $I_A I_B I_C$: A B C三相电流有效值A B C phase current I_{avg} : 电流平均值average current I_{pmax} : 电流最大峰值max peak current $\cos \phi$: 功率因数power factor $\cos \phi_{avg}$: 功率因数平均值 average power factor

IEC 60947-2

Calibration current oscillogram

Oscillogram No.: CA100-24-004



$U_{AB}=427.8V$
 $U_{BC}=428.4V$
 $U_{CA}=427.4V$
 $U_{tavg}=427.9V$

 $I_A= 20.57kA$
 $I_B= 20.64kA$
 $I_C= 20.46kA$
 $I_{avg}= 20.56kA$

 $I_{pA}= 37.82kA$
 $I_{pB}= 41.39kA$
 $I_{pC}= 31.23kA$
 $I_{pmax}= 41.39kA$

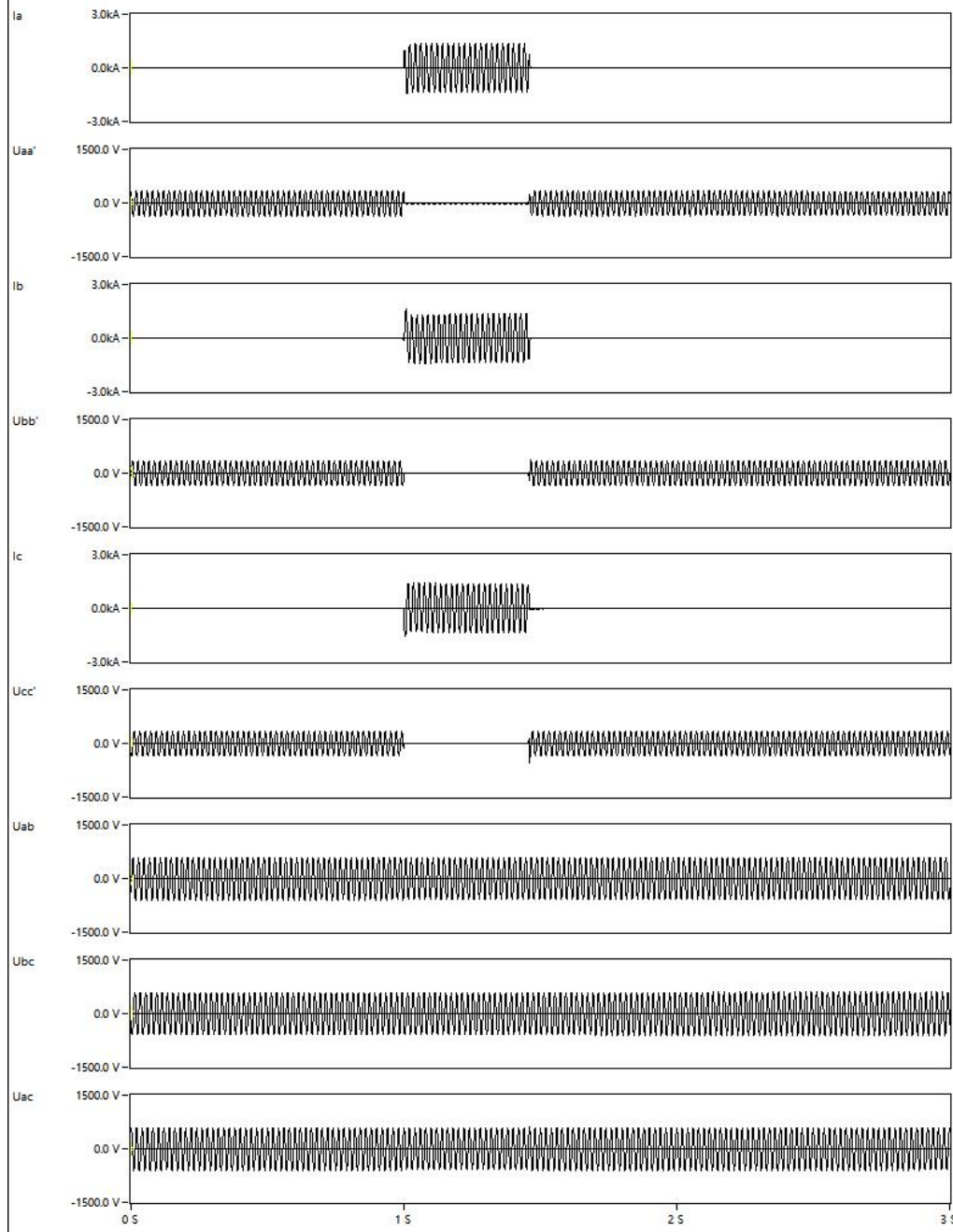
 $\cos A= 0.278$
 $\cos B= 0.275$
 $\cos C= 0.265$
 $\cos\phi_{avg}= 0.273$

U_t : 试验电压test voltage $I_A I_B I_C$: A B C三相电流有效值A B C phase current
 I_{avg} : 电流平均值average current I_{pmax} : 电流最大峰值max peak current
 $\cos\phi$: 功率因数power factor $\cos\phi_{avg}$: 功率因数平均值 average power factor

IEC 60947-2

过载操作性能

Oscillogram: SFA231303-#1-01



Product: MCCB
 Type: 3P/150A
 No.: #1
 Sequence: MB1
 I: 932.6A
 cos φ: 0.51

 U_t: 423.3V

 I_p A=1.429kA
 I_p B=1.613kA
 I_p C=1.599kA

 I²t A=416.7kAAS
 I²t B=438.8kAAS
 I²t C=442.0kAAS

 T_{mb} A=0.465 S
 T_{mb} B=0.472 S
 T_{mb} C=0.465 S

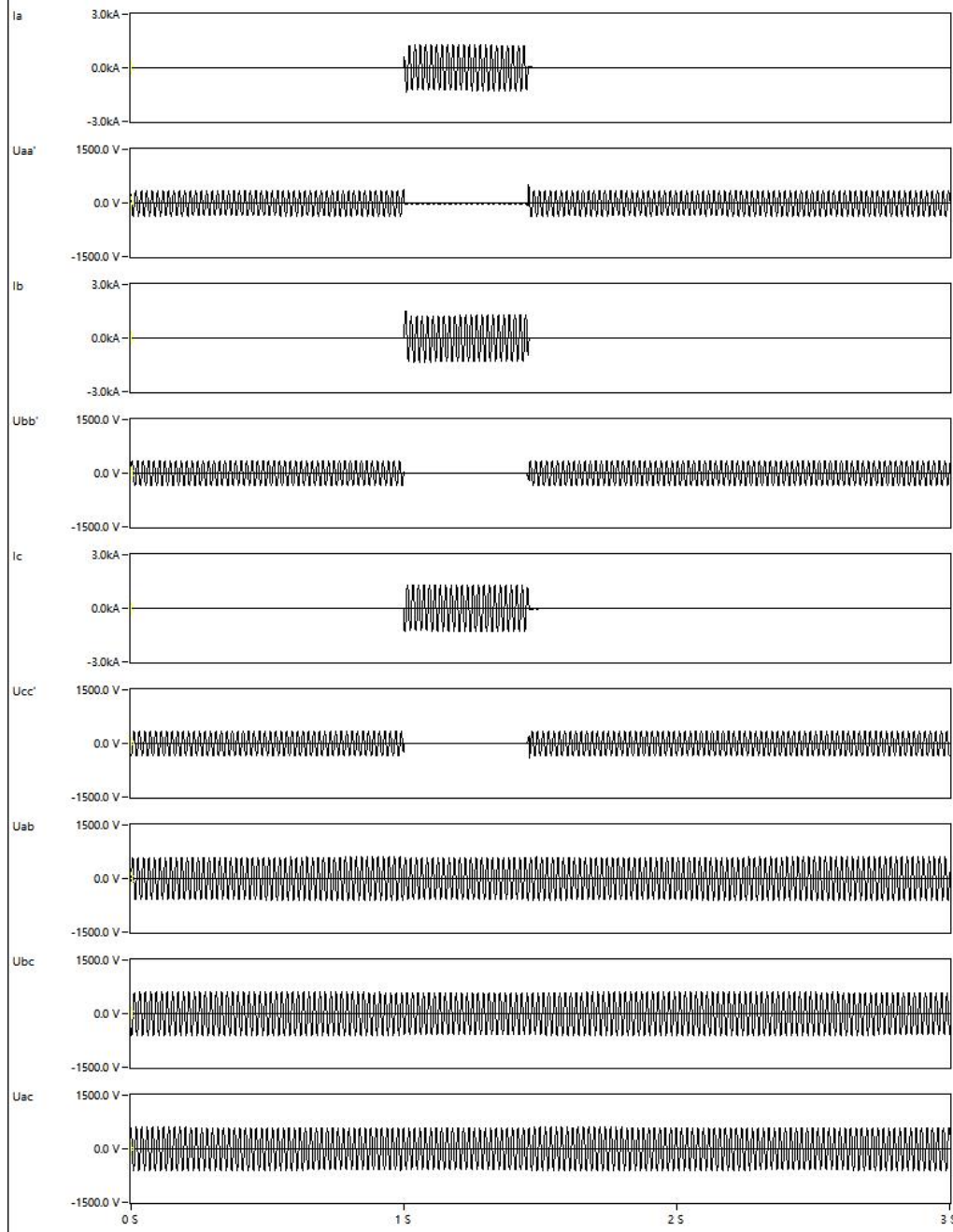
 T_{arc} A=0.006 S
 T_{arc} B=0.008 S
 T_{arc} C=0.005 S

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

过载操作性能

Oscillogram: SFA231303-#1-02



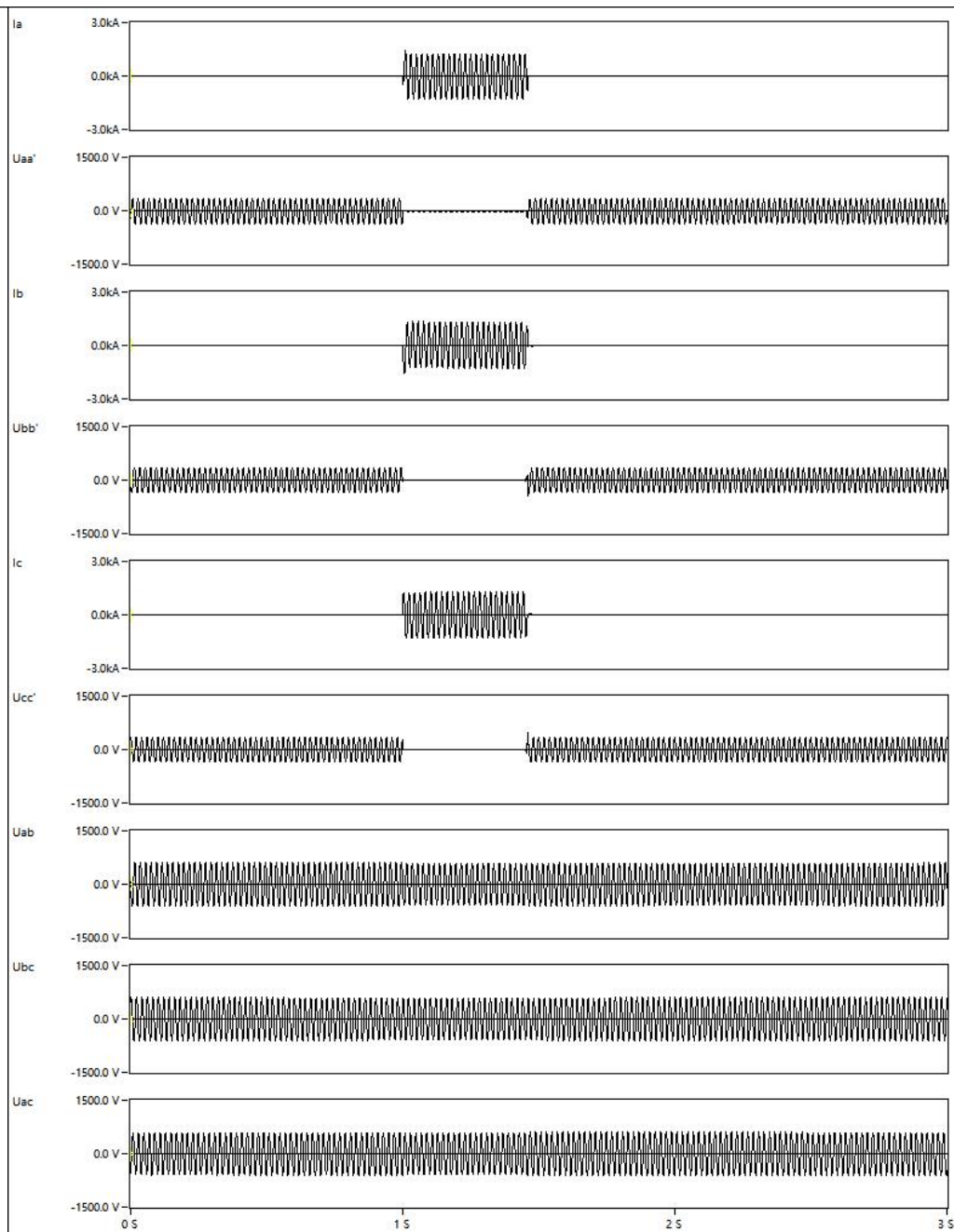
Product: MCCB
 Type: 3P/150A
 No.: #1
 Sequence: MB5
 I: 932.6A
 cos φ: 0.51
 U_t: 423.3V
 I_p A=1.393kA
 I_p B=1.518kA
 I_p C=1.317kA
 I²t A=364.9kAAS
 I²t B=384.6kAAS
 I²t C=386.2kAAS
 T_{mb} A=0.460 S
 T_{mb} B=0.460 S
 T_{mb} C=0.460 S
 T_{arc} A=0.008 S
 T_{arc} B=0.008 S
 T_{arc} C=0.007 S

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

过载操作性能

Oscillogram: SFA231303-#1-03



Product: MCCB
 Type: 3P/150A
 No.: #1
 Sequence: MB9
 I: 932.6A
 $\cos \phi$: 0.51

U_t : 423.3V

I_p A=1.408kA
 I_p B=1.559kA
 I_p C=1.329kA

I^2t A=367.2kAAS
 I^2t B=389.4kAAS
 I^2t C=385.8kAAS

T_{mb} A=0.464 S
 T_{mb} B=0.468 S
 T_{mb} C=0.460 S

T_{arc} A=0.007 S
 T_{arc} B=0.009 S
 T_{arc} C=0.004 S

I: prospective current 预期电流有效值 $\cos \phi$: prospective power factor 预期功率因数

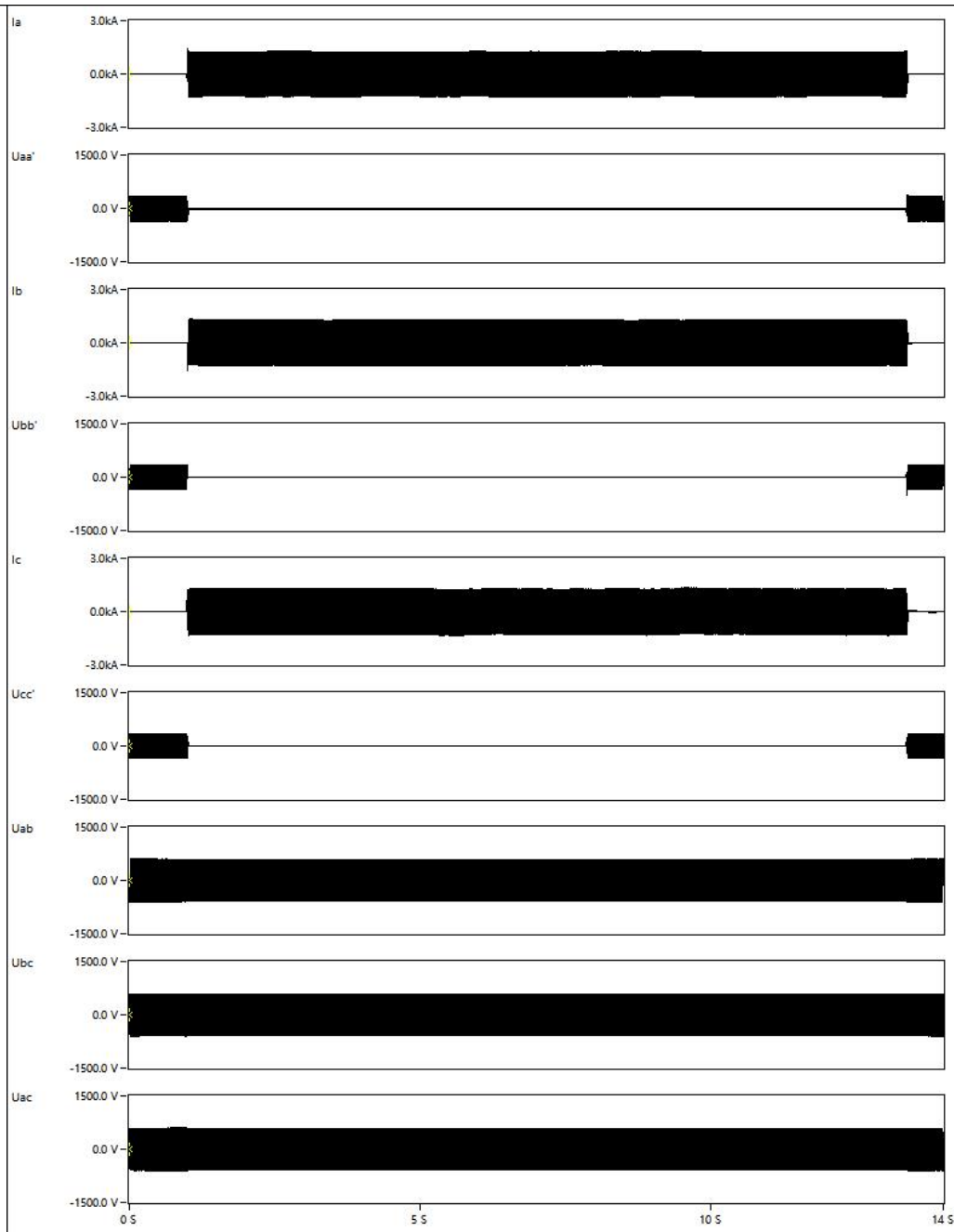
U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量

T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

IEC 60947-2

过载操作性能

Oscillogram: SFA231303-#1-04



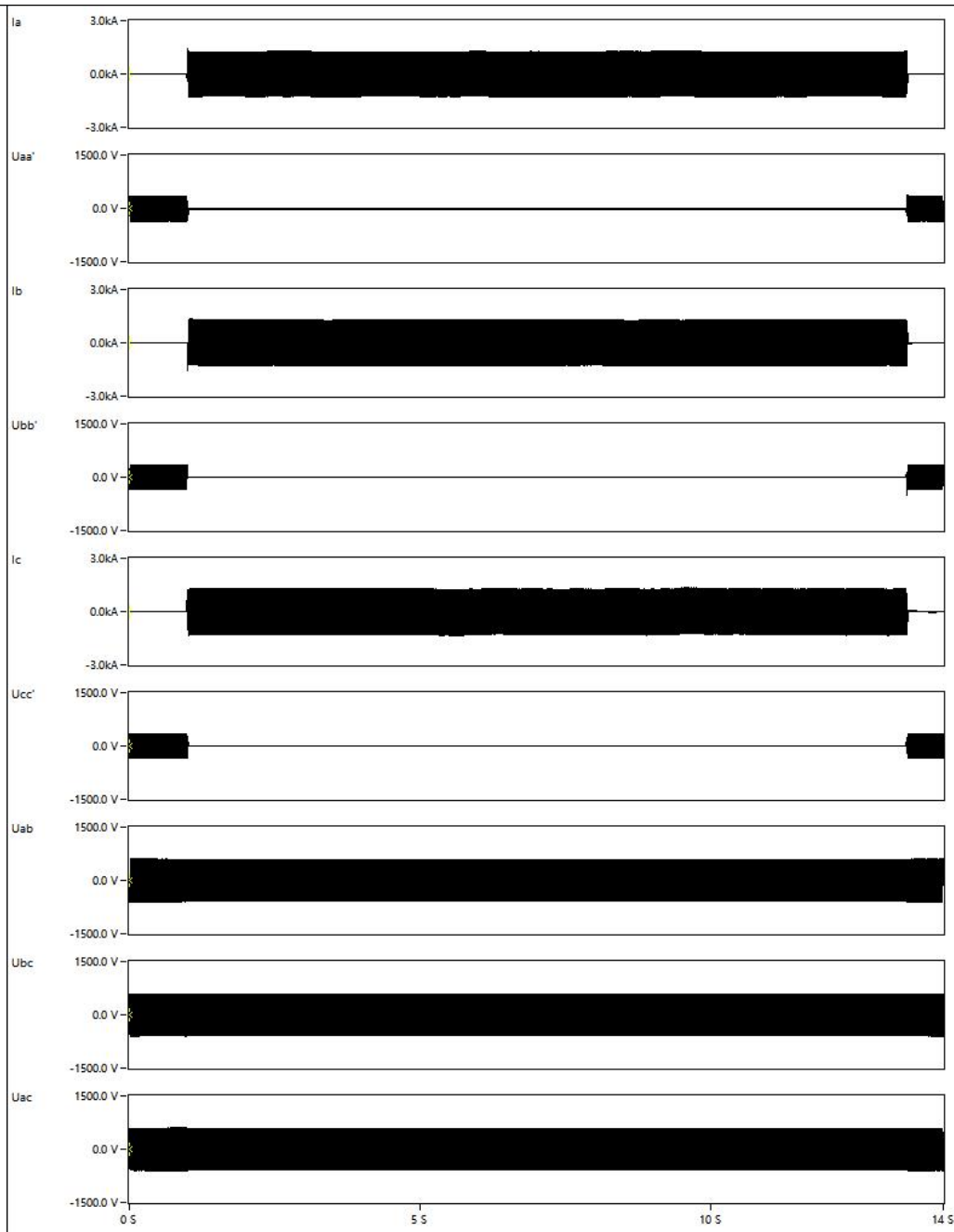
Product: MCCB
 Type: 3P/150A
 No.: #1
 Sequence: M1
 I: 932.6A
 cos φ: 0.51
 U_t: 423.3V
 I_p A=1.408kA
 I_p B=1.542kA
 I_p C=1.357kA
 I²t A=9.964MAAS
 I²t B=10.32MAAS
 I²t C=10.41MAAS
 T_{mb} A=12.386 S
 T_{mb} B=12.386 S
 T_{mb} C=12.387 S
 T_{arc} A=0.009 S
 T_{arc} B=0.009 S
 T_{arc} C=0.010 S

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

过载操作性能

Oscillogram: SFA231303-#1-05



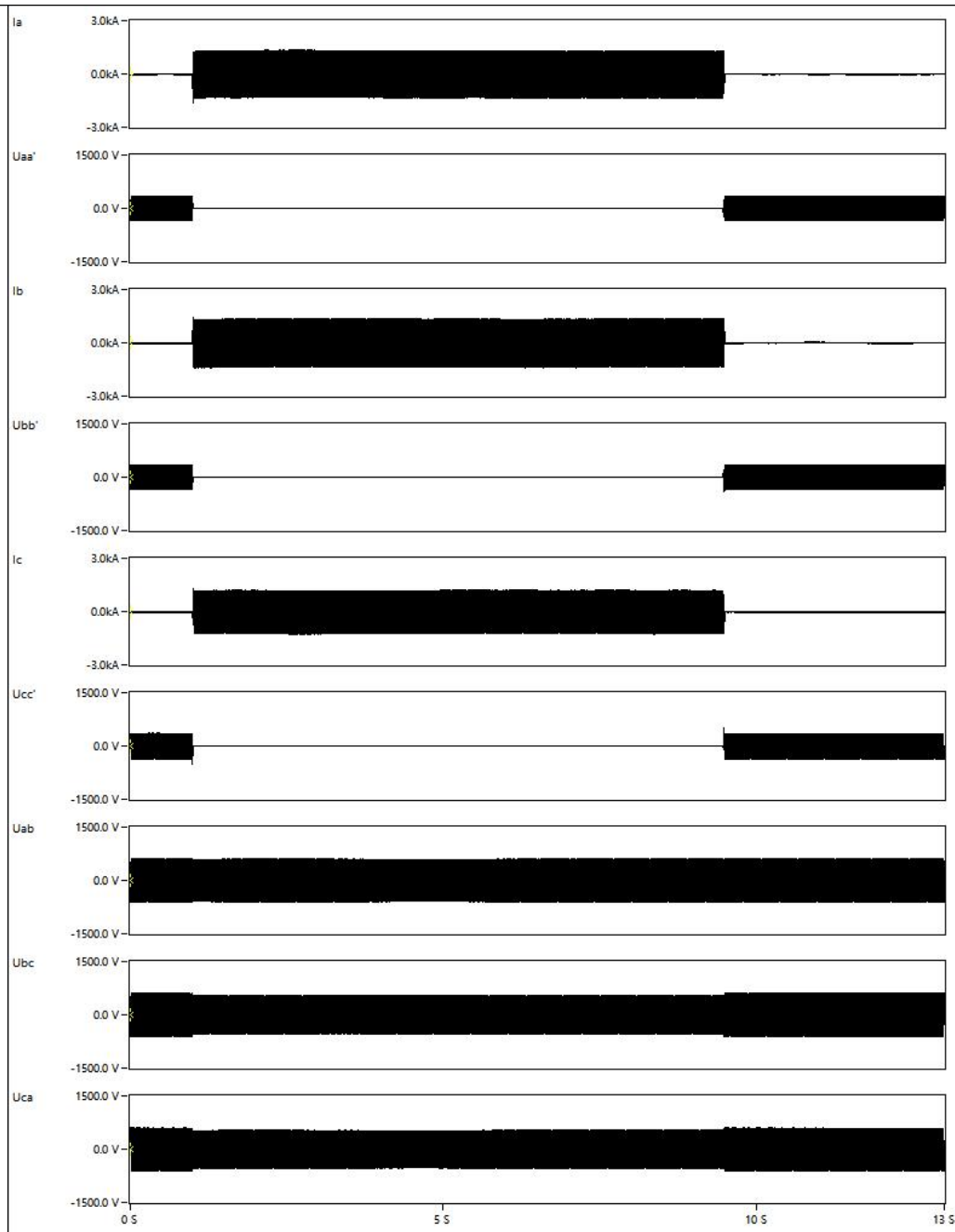
Product: MCCB
 Type: 3P/150A
 No.: #1
 Sequence: M2
 I: 932.6A
 cos φ: 0.51
 U_t: 423.3V
 I_p A=1.408kA
 I_p B=1.542kA
 I_p C=1.357kA
 I²t A=9.964MAAS
 I²t B=10.32MAAS
 I²t C=10.41MAAS
 T_{mb} A=12.386 S
 T_{mb} B=12.386 S
 T_{mb} C=12.387 S
 T_{arc} A=0.009 S
 T_{arc} B=0.009 S
 T_{arc} C=0.010 S

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

过载操作性能

Oscillogram: SFA231303-#1-06



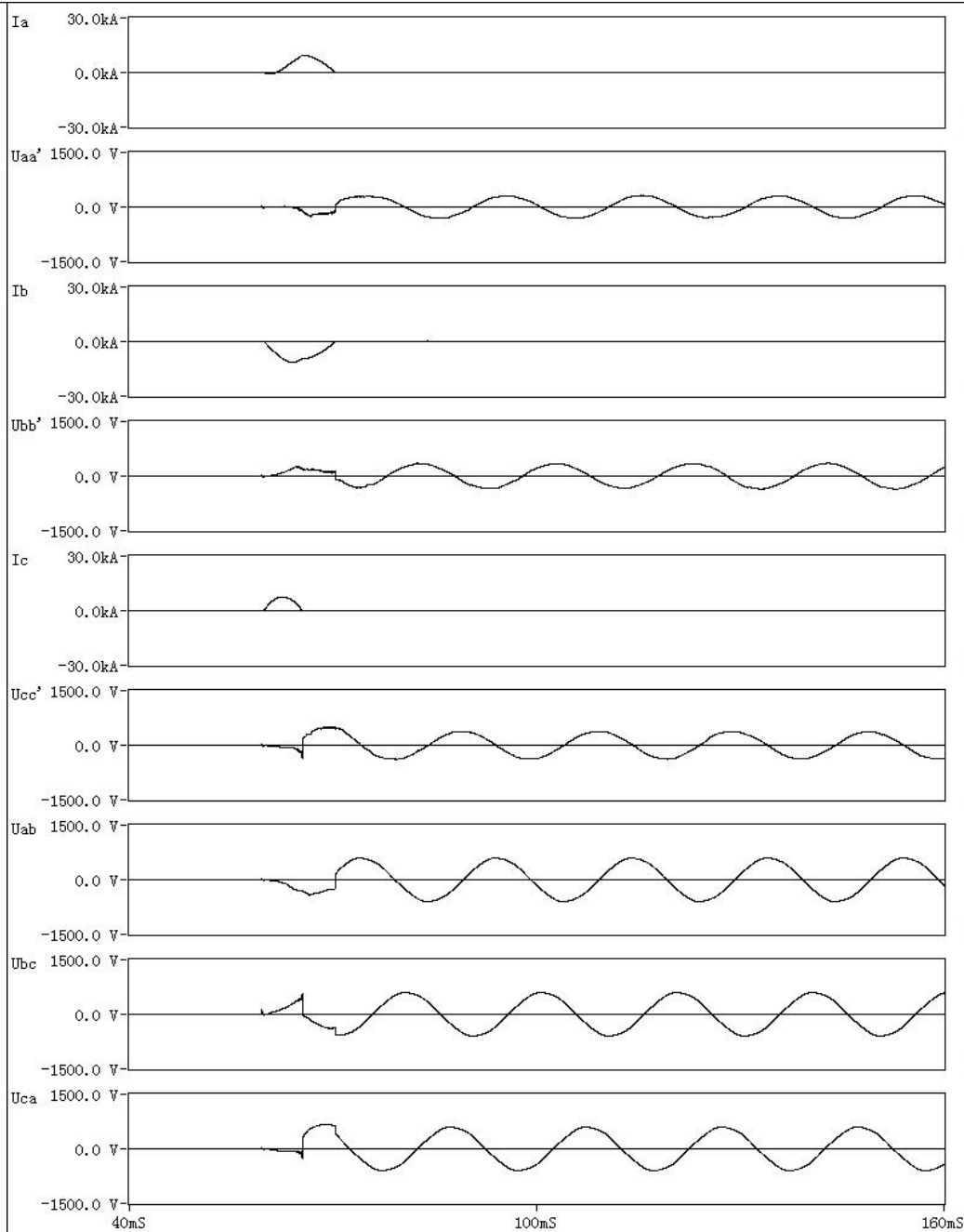
Product: MCCB
 Type: 3P/150A
 No.: #1
 Sequence: M2
 I: 932.6A
 cos φ: 0.51
 U_t: 423.3V
 I_p A=1.625kA
 I_p B=1.450kA
 I_p C=1.290kA
 I²t A=7.471MAAS
 I²t B=7.923MAAS
 I²t C=6.310MAAS
 T_{mb} A=8.490 S
 T_{mb} B=8.491 S
 T_{mb} C=8.488 S
 T_{arc} A=0.003 S
 T_{arc} B=0.003 S
 T_{arc} C=0.007 S

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#2-01



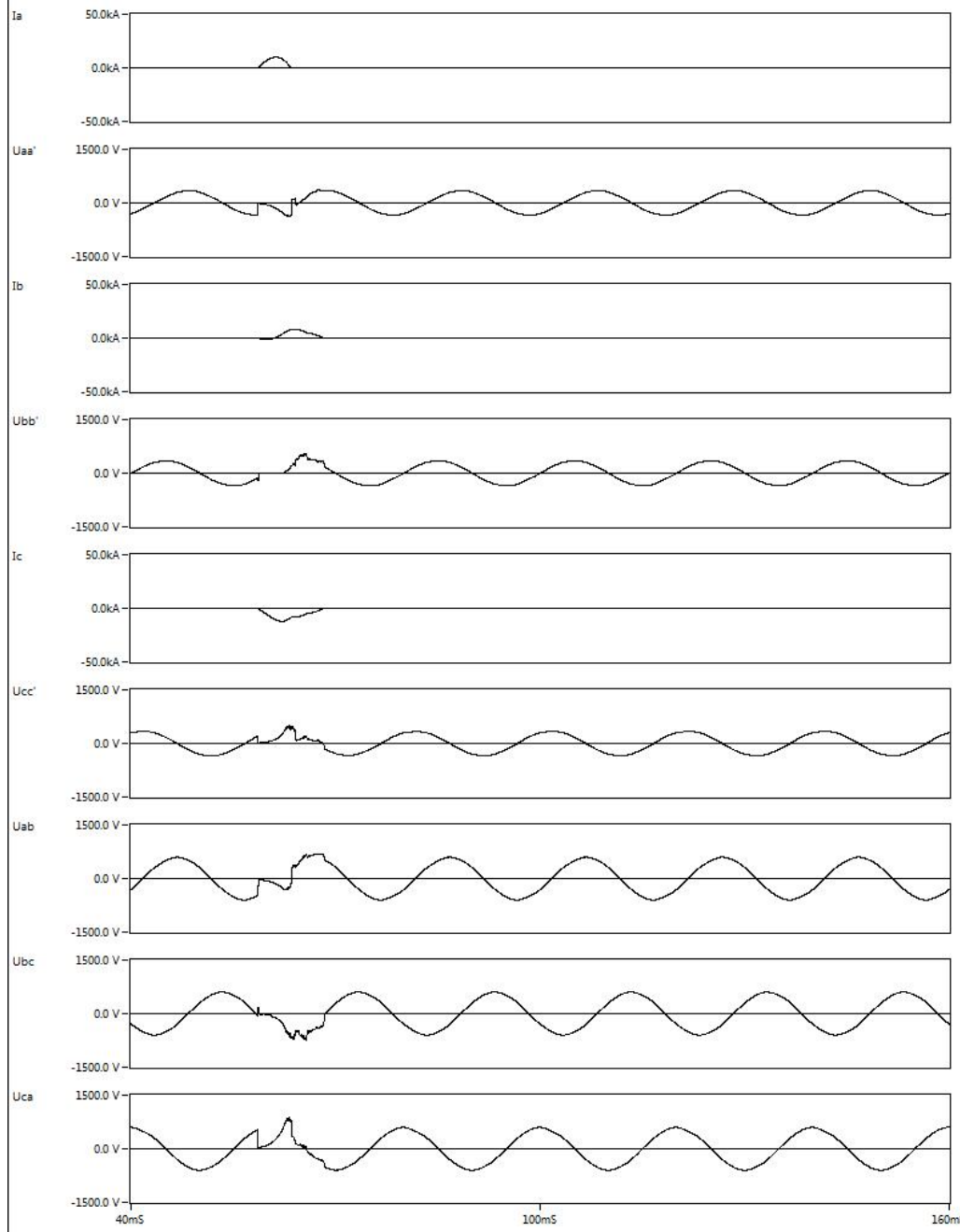
Product: MCCB
 Type: 3P/150A
 No.: #2
 Sequence: O
 I/I_p:
 10.13/17.36kA
 cos φ: 0.493
 U_t: 428.0V
 I_p A=9.534kA
 I_p B=11.469kA
 I_p C=7.438kA
 I²t A=330.0kAAS
 I²t B=642.3kAAS
 I²t C=168.1kAAS
 T_{mb} A=10.54mS
 T_{mb} B=10.48mS
 T_{mb} C=5.680mS
 T_{arc} A=5.763mS
 T_{arc} B=8.948mS
 T_{arc} C=4.701mS

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#2-02



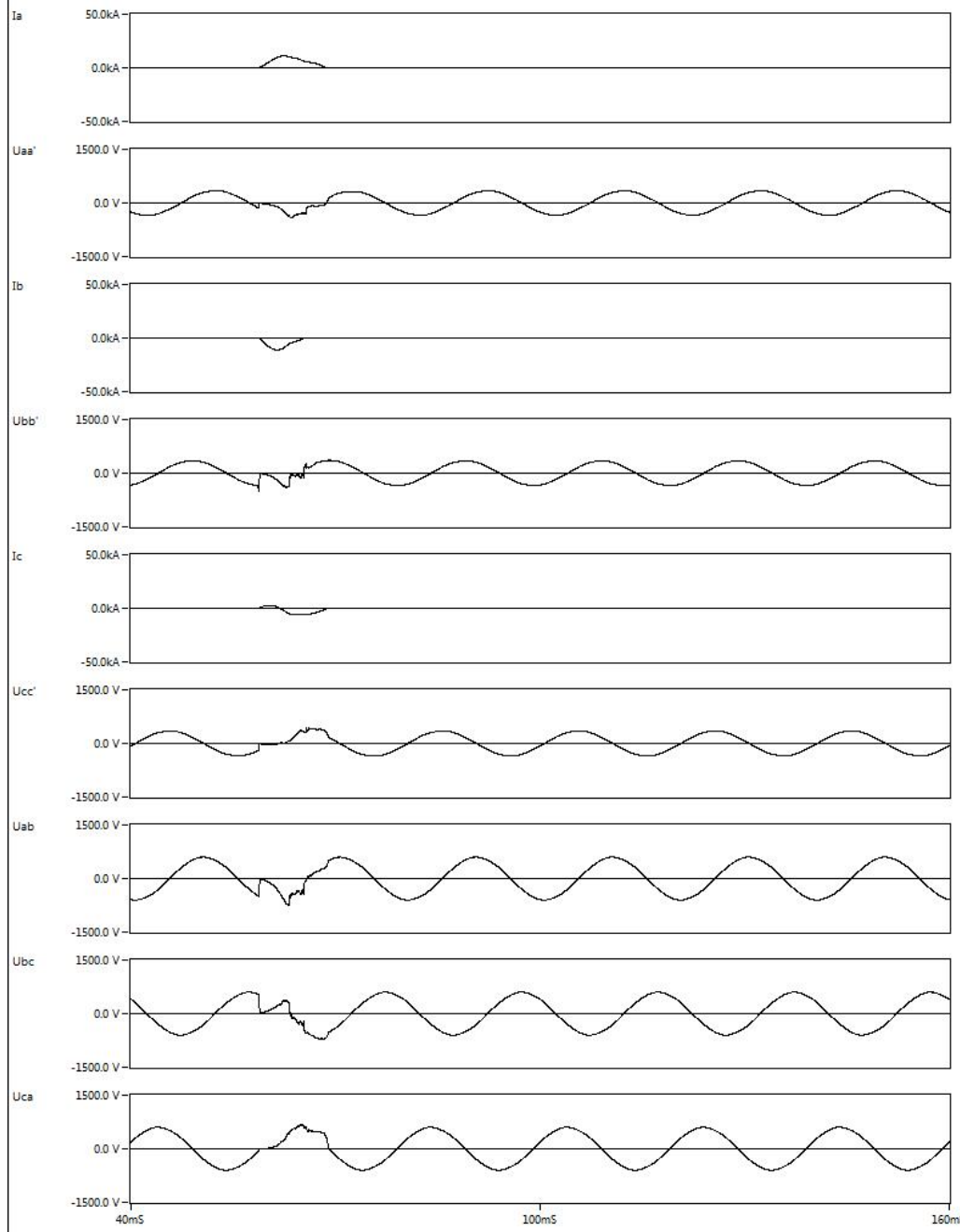
Product: MCCB
 Type: 3P/150A
 No.: #2
 Sequence: CO1
 I/I_p: 10.13/17.36kA
 cos φ : 0.493
 U_t: 428.0V
 I_p A=10.005kA
 I_p B=8.186kA
 I_p C=12.234kA
 I²t A=246.4kAAS
 I²t B=202.8kAAS
 I²t C=541.7kAAS
 T_{mb} A=4.900mS
 T_{mb} B=9.480mS
 T_{mb} C=9.620mS
 T_{arc} A=3.591mS
 T_{arc} B=5.265mS
 T_{arc} C=8.158mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因素
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#2-03



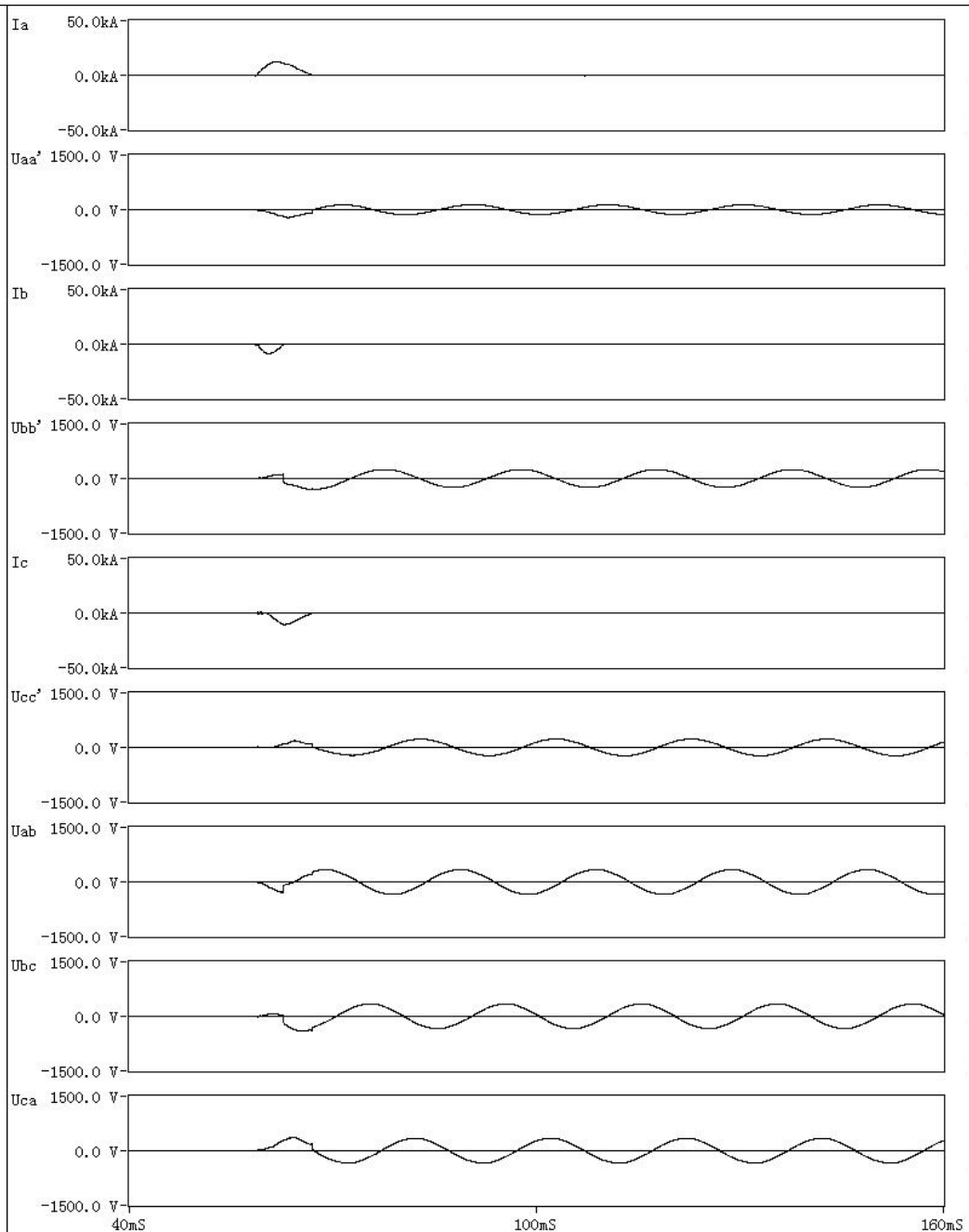
Product: MCCB
 Type: 3P/150A
 No.: #2
 Sequence: CO2
 I/I_p: 10.13/17.36kA
 cos φ: 0.493
 U_t: 428.0V
 I_p A=11.193kA
 I_p B=11.071kA
 I_p C=6.083kA
 I²t A=505.7kAAS
 I²t B=326.6kAAS
 I²t C=156.1kAAS
 T_{mb} A=9.860mS
 T_{mb} B=6.560mS
 T_{mb} C=9.920mS
 T_{arc} A=7.857mS
 T_{arc} B=4.954mS
 T_{arc} C=5.288mS

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因素
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#3-01



Product: MCCB
 Type: 3P/150A
 No.: #3
 Sequence: O
 I/I_p:
 18.19/36.57kA
 cos φ : 0.290

 U_t: 248.2V

 I_p A=12.446kA
 I_p B=8.996kA
 I_p C=10.753kA

 I²t A=555.4kAAS
 I²t B=150.3kAAS
 I²t C=302.7kAAS

 T_{mb} A=8.020mS
 T_{mb} B=4.060mS
 T_{mb} C=6.720mS

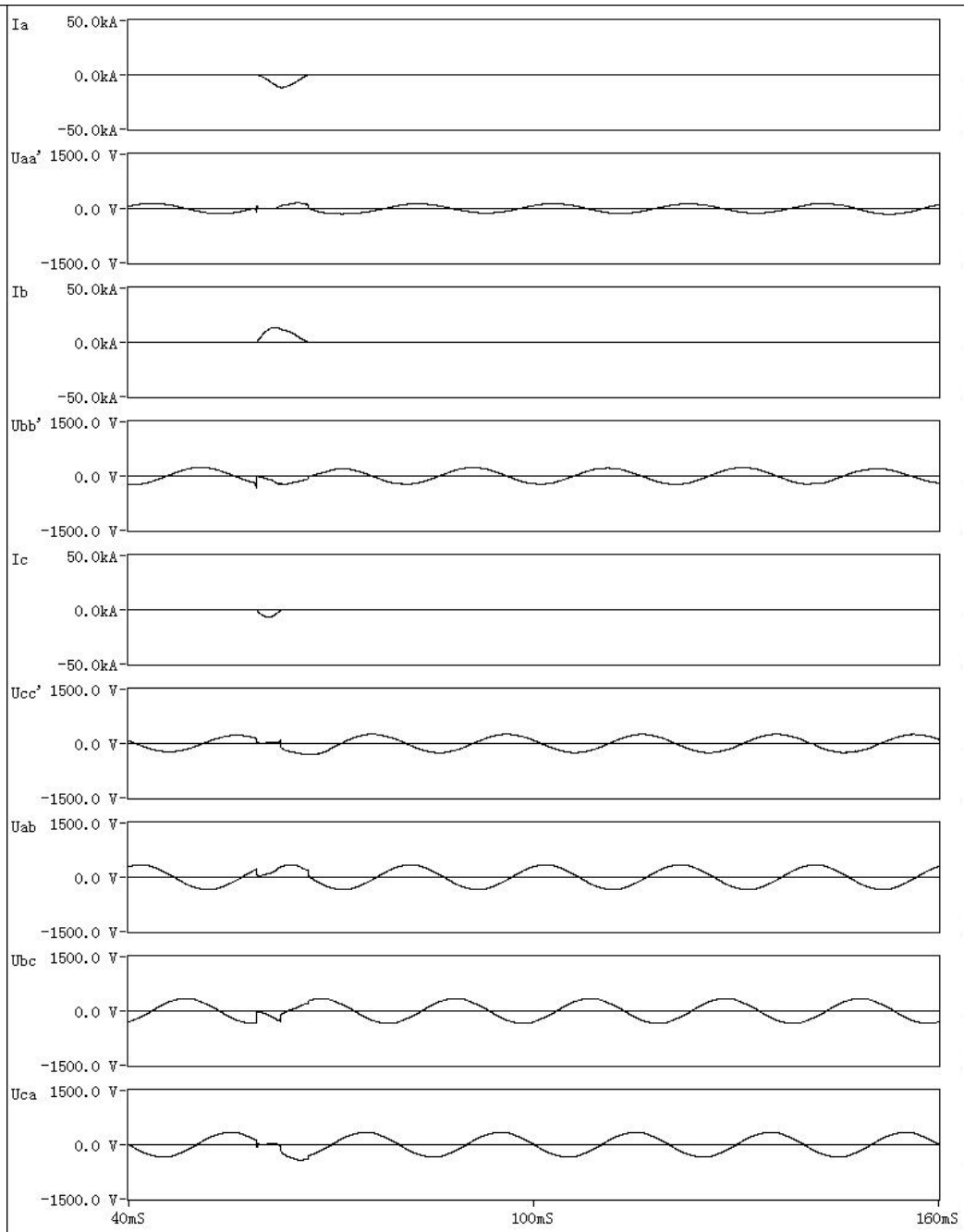
 T_{arc} A=6.773mS
 T_{arc} B=2.787mS
 T_{arc} C=5.508mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#3-02



Product: MCCB
 Type: 3P/150A
 No.: #3
 Sequence: CO1
 I/I_p:
 18.19/36.57kA
 cos φ : 0.290

 U_t: 248.2V

 I_p A=11.957kA
 I_p B=13.786kA
 I_p C=6.878kA

 I²t A=414.8kAAS
 I²t B=649.2kAAS
 I²t C=86.69kAAS

 T_{mb} A=7.360mS
 T_{mb} B=7.540mS
 T_{mb} C=3.560mS

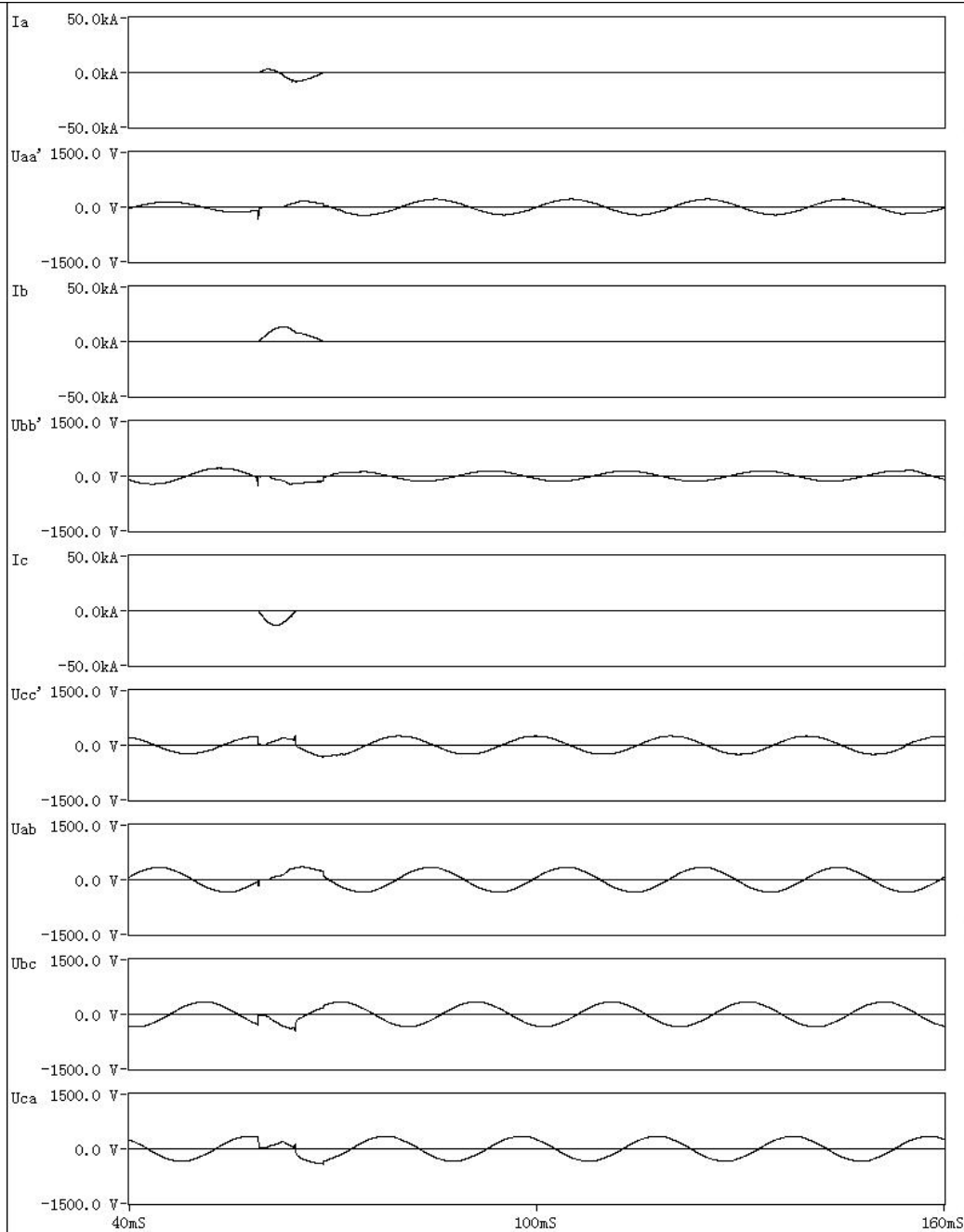
 T_{arc} A=4.348mS
 T_{arc} B=6.627mS
 T_{arc} C=2.140mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#3-03



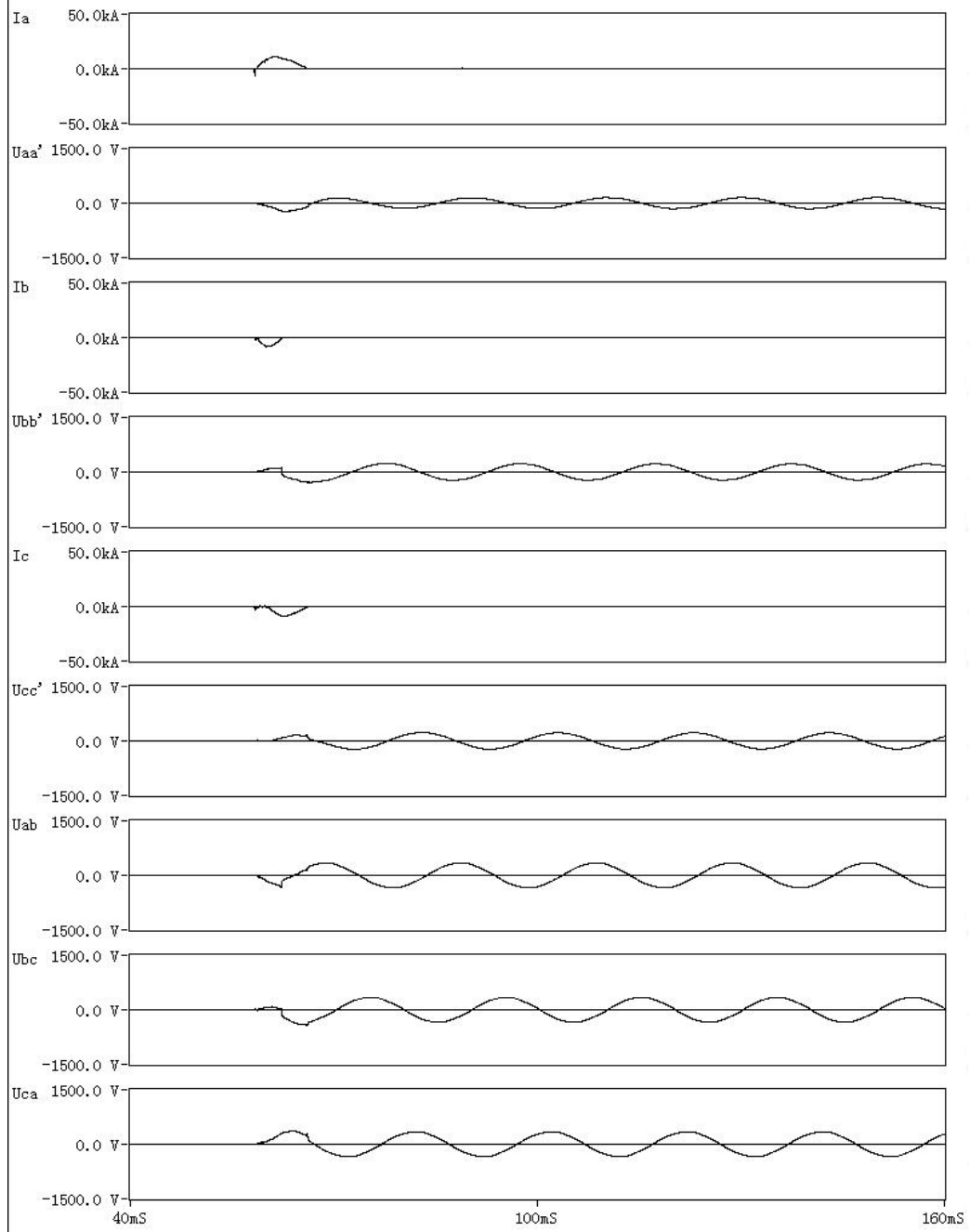
Product: MCCB
 Type: 3P/150A
 No.: #3
 Sequence: CO2
 I/I_p:
 18.19/36.57kA
 cos φ : 0.290
 U_t: 248.2V
 I_p A=8.707kA
 I_p B=13.630kA
 I_p C=13.503kA
 I²t A=209.6kAAS
 I²t B=707.1kAAS
 I²t C=500.2kAAS
 T_{mb} A=9.420mS
 T_{mb} B=9.580mS
 T_{mb} C=5.520mS
 T_{arc} A=5.755mS
 T_{arc} B=7.927mS
 T_{arc} C=4.247mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#4-01



Product: MCCB
 Type: 3P/40A
 No.: #4
 Sequence: O
 I/I_p:
 18.19/36.57kA
 cos φ : 0.290

 U_t: 248.2V

 I_p A=10.915kA
 I_p B=8.590kA
 I_p C=9.097kA

 I²_t A=412.3kAAS
 I²_t B=123.2kAAS
 I²_t C=212.2kAAS

 T_{mb} A=7.780mS
 T_{mb} B=4.000mS
 T_{mb} C=6.020mS

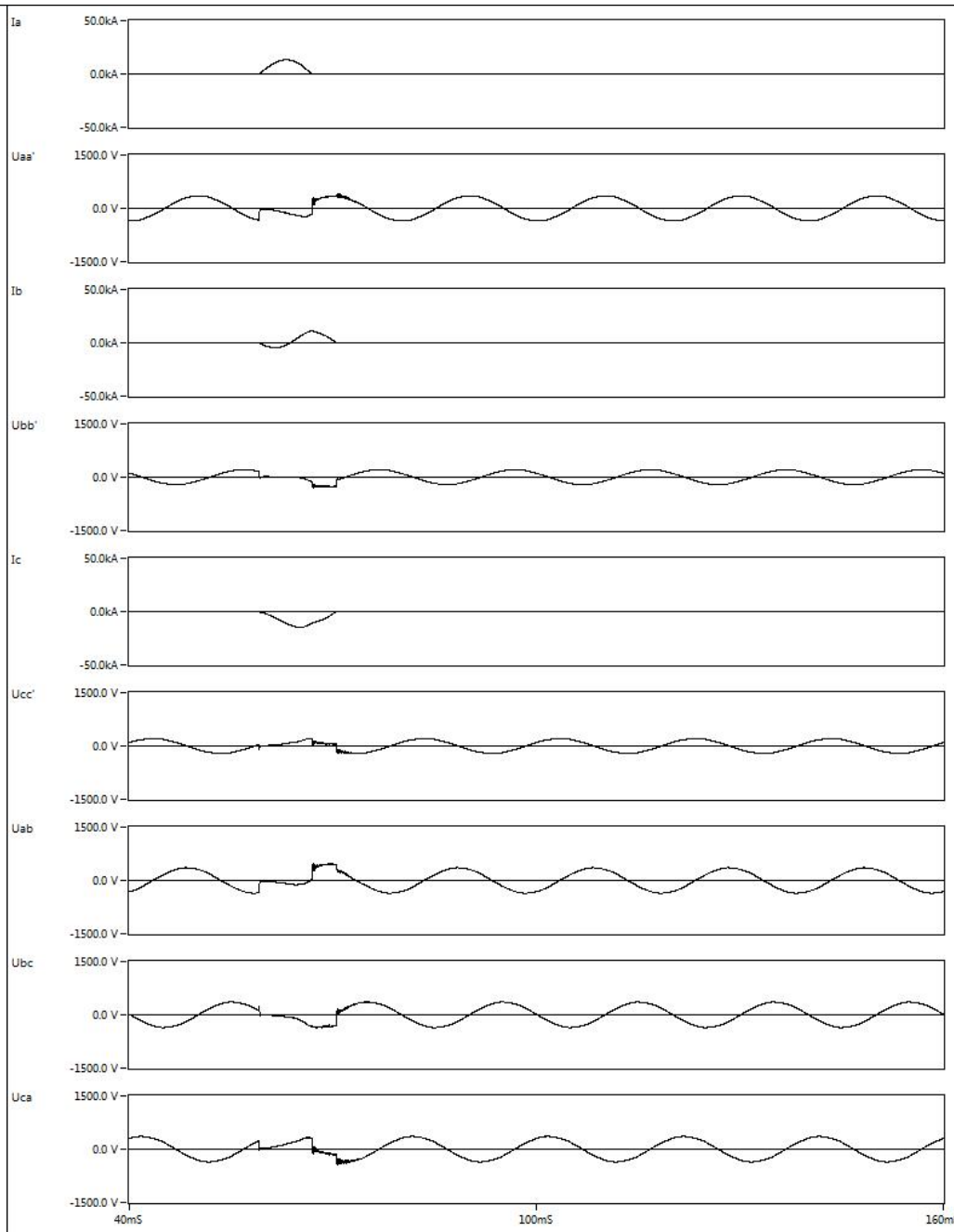
 T_{arc} A=6.813mS
 T_{arc} B=2.973mS
 T_{arc} C=5.021mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²_t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#4-02



Product: MCCB
 Type: 3P/40A
 No.: #4
 Sequence: CO1
 I/I_p:
 18.19/36.57kA
 cos φ : 0.290

 U_t: 248.2V

 I_p A=13.366kA
 I_p B=11.174kA
 I_p C=14.772kA

 I²t A=692.0kAAS
 I²t B=409.2kAAS
 I²t C=1.013MAAS

 T_{mb} A=7.800mS
 T_{mb} B=11.32mS
 T_{mb} C=11.30mS

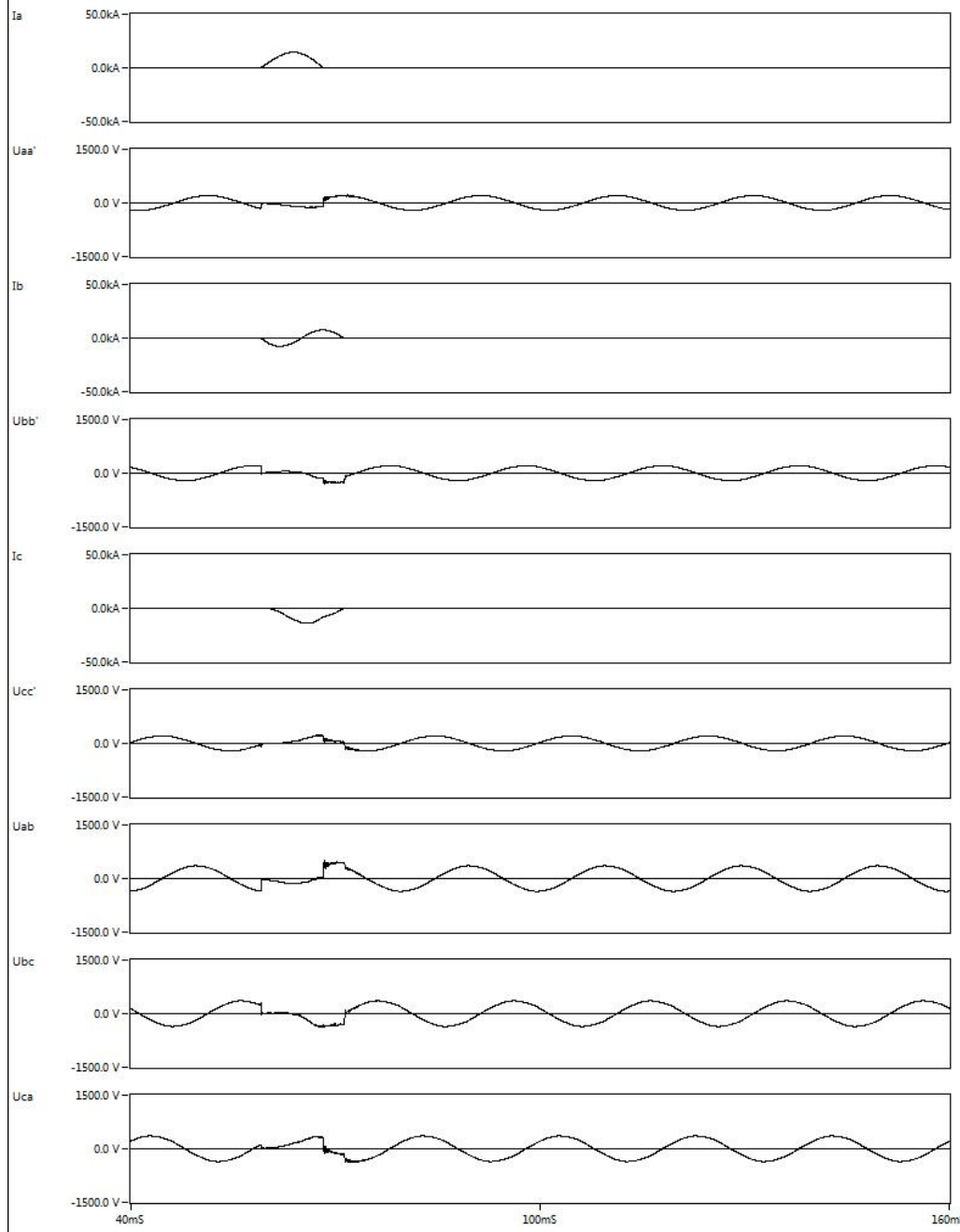
 T_{arc} A=5.276mS
 T_{arc} B=4.744mS
 T_{arc} C=9.332mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因素
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#4-03



Product: MCCB
 Type: 3P/40A
 No.: #4
 Sequence: CO2
 I/I_p:
 18.19/36.57kA
 cos φ : 0.290

 U_t: 248.2V

 I_p A=14.587kA
 I_p B=8.092kA
 I_p C=14.099kA

 I²t A=947.9kAAS
 I²t B=363.0kAAS
 I²t C=861.1kAAS

 T_{mb} A=9.100mS
 T_{mb} B=12.20mS
 T_{mb} C=11.96mS

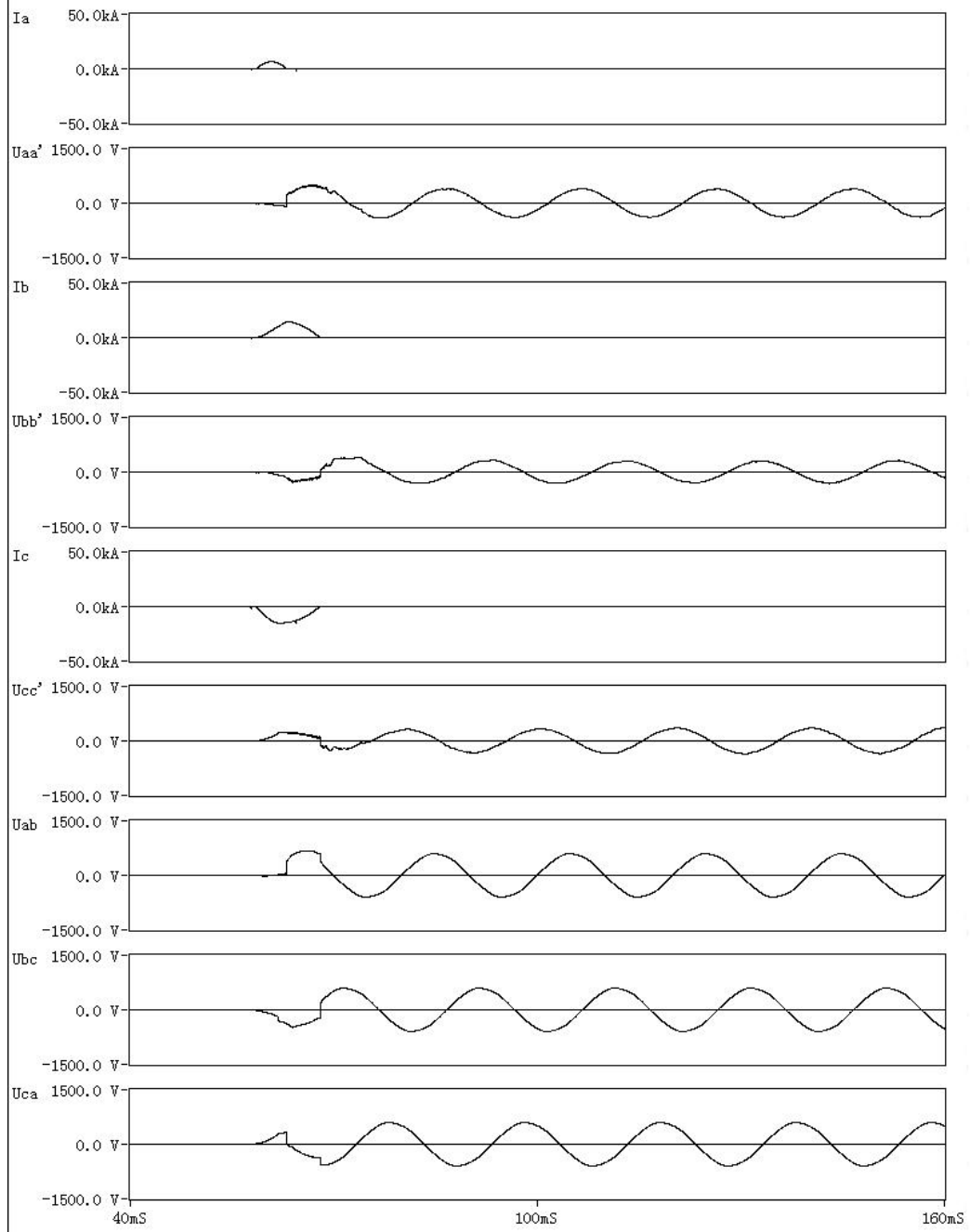
 T_{arc} A=6.251mS
 T_{arc} B=9.788mS
 T_{arc} C=7.788mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因素
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#5-01



Product: MCCB
 Type: 3P/150A
 No.: #5
 Sequence: O
 I/I_p:
 15.54/31.08kA
 cos φ : 0.286

 U_t: 427.4V

 I_p A=6.416kA
 I_p B=14.349kA
 I_p C=15.410kA

 I²t A=94.65kAAS
 I²t B=794.3kAAS
 I²t C=1.138MAAS

 T_{mb} A=4.400mS
 T_{mb} B=9.280mS
 T_{mb} C=9.380mS

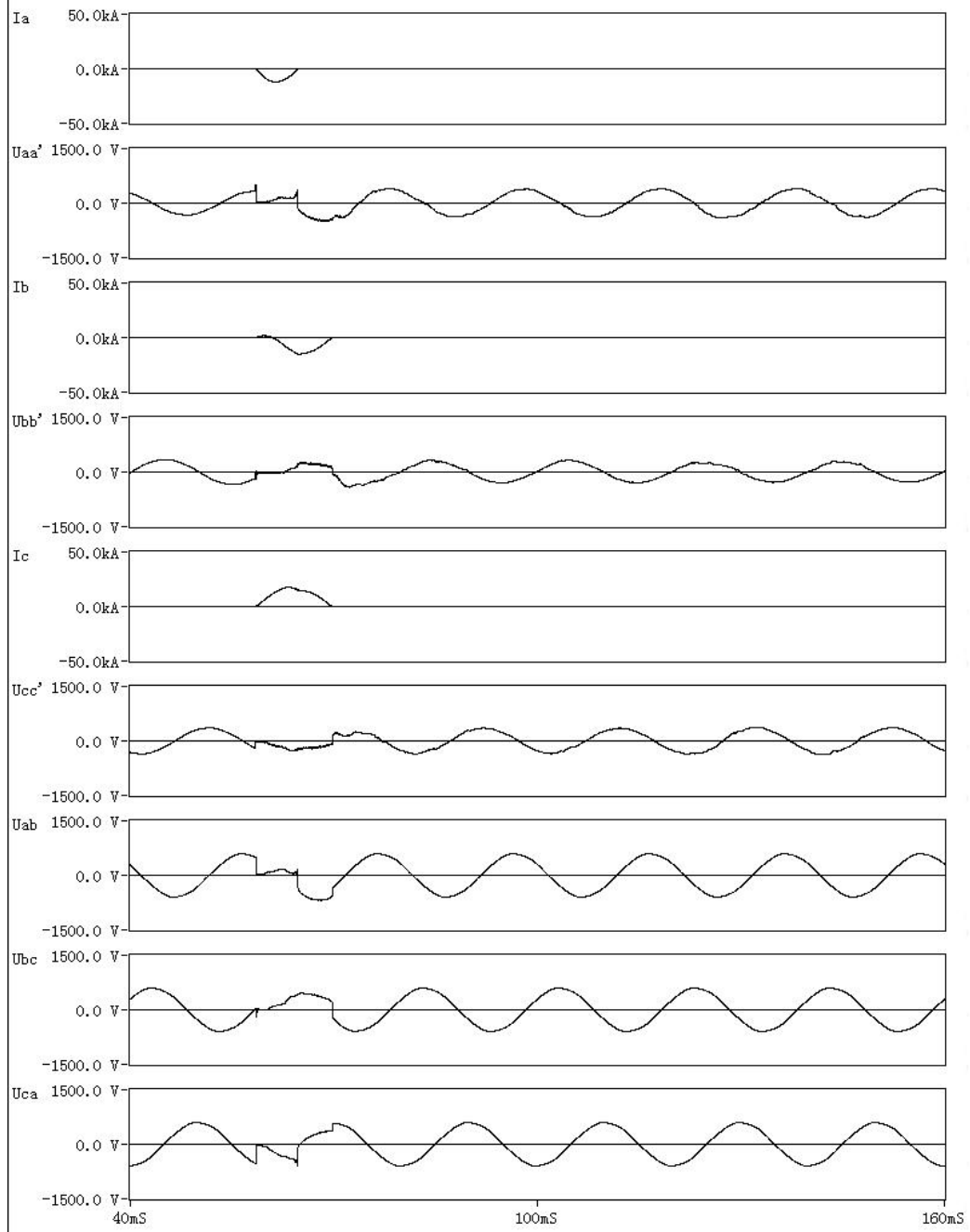
 T_{arc} A=2.893mS
 T_{arc} B=7.094mS
 T_{arc} C=8.593mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#5-02



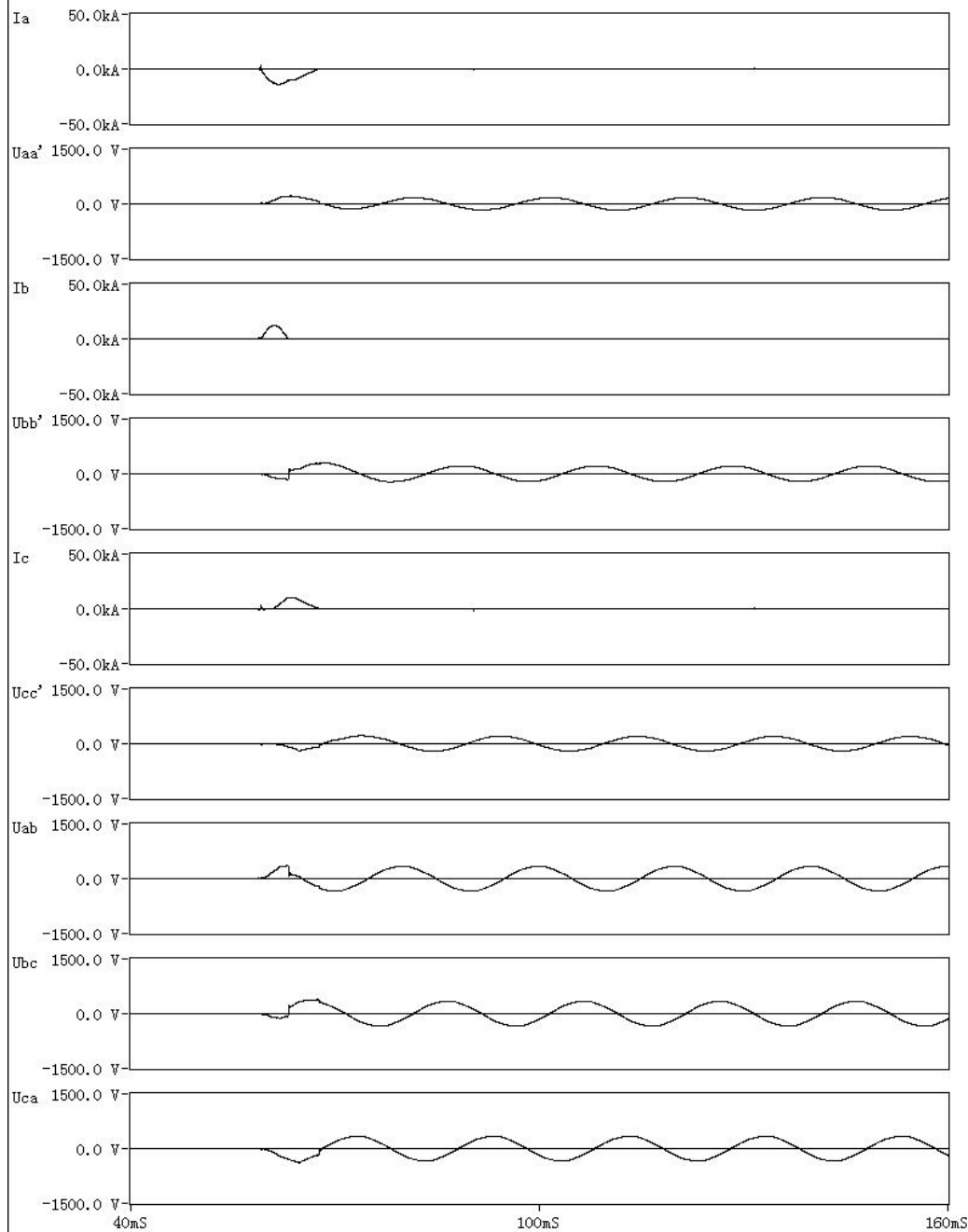
Product: MCCB
 Type: 3P/150A
 No.: #5
 Sequence: CO
 I/I_p: 15.54/31.08kA
 cos φ : 0.286
 U_t: 427.4V
 I_p A=12.176kA
 I_p B=15.341kA
 I_p C=17.593kA
 I²_t A=471.4kAAS
 I²_t B=911.6kAAS
 I²_t C=1.627MAAS
 T_{mb} A=6.160mS
 T_{mb} B=11.08mS
 T_{mb} C=11.20mS
 T_{arc} A=4.660mS
 T_{arc} B=7.295mS
 T_{arc} C=9.720mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²_t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#6-01



Product: MCCB
 Type: 3P/150A
 No.: #6
 Sequence: O
 I/I_p:
 25.69/53.44kA
 cos φ : 0.232

 U_t: 246.2V

 I_p A=14.207kA
 I_p B=12.411kA
 I_p C=10.499kA

 I²t A=718.8kAAS
 I²t B=293.0kAAS
 I²t C=287.9kAAS

 T_{mb} A=8.420mS
 T_{mb} B=3.940mS
 T_{mb} C=6.600mS

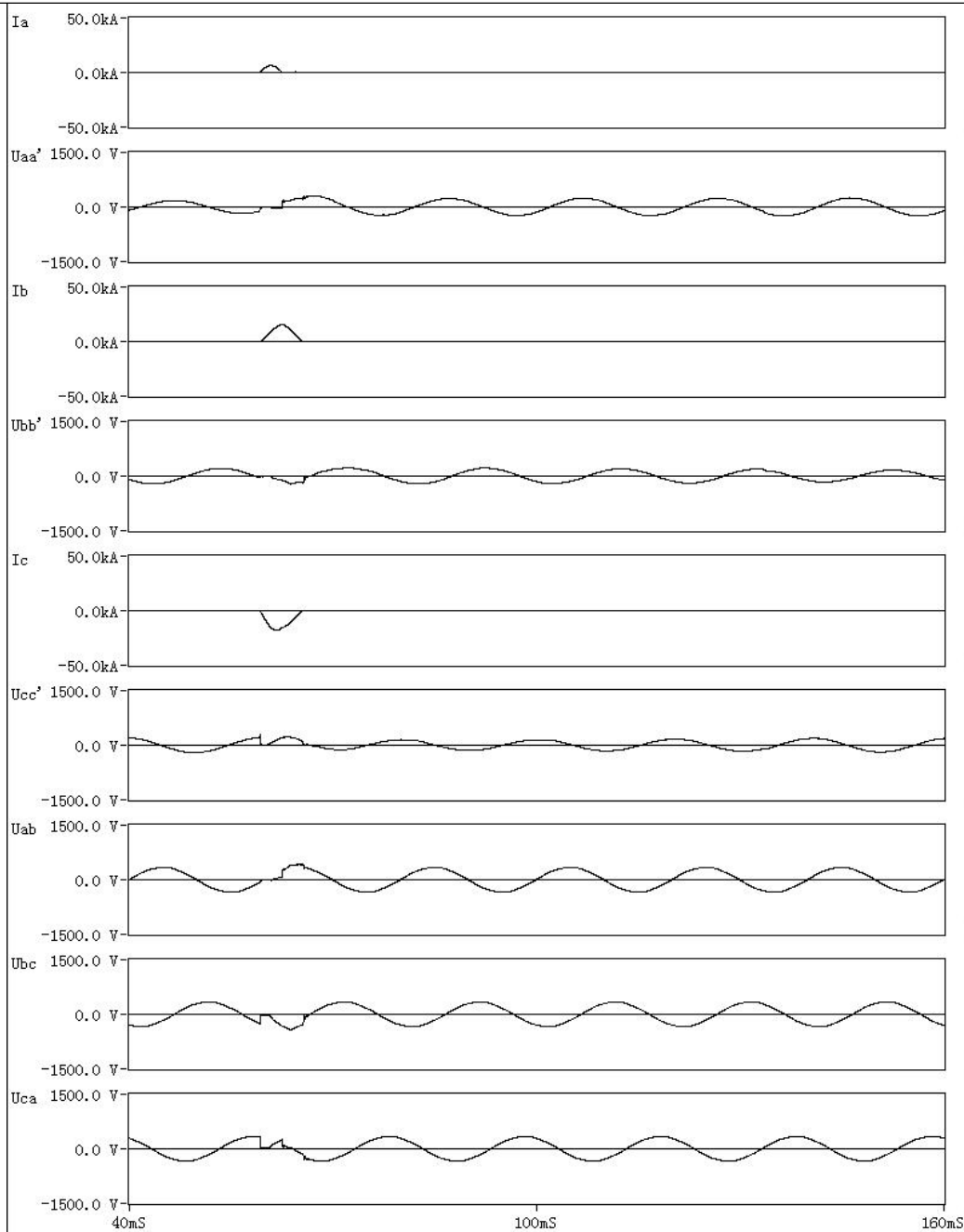
 T_{arc} A=7.687mS
 T_{arc} B=3.373mS
 T_{arc} C=5.788mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#6-02



Product: MCCB
 Type: 3P/150A
 No.: #6
 Sequence: CO
 I/p:
 25.69/53.44kA
 cos ϕ : 0.232

 U_t: 246.2V

 I_p A=6.635kA
 I_p B=15.693kA
 I_p C=17.848kA

 I²t A=69.17kAAS
 I²t B=615.7kAAS
 I²t C=922.5kAAS

 T_{mb} A=3.260mS
 T_{mb} B=6.200mS
 T_{mb} C=6.320mS

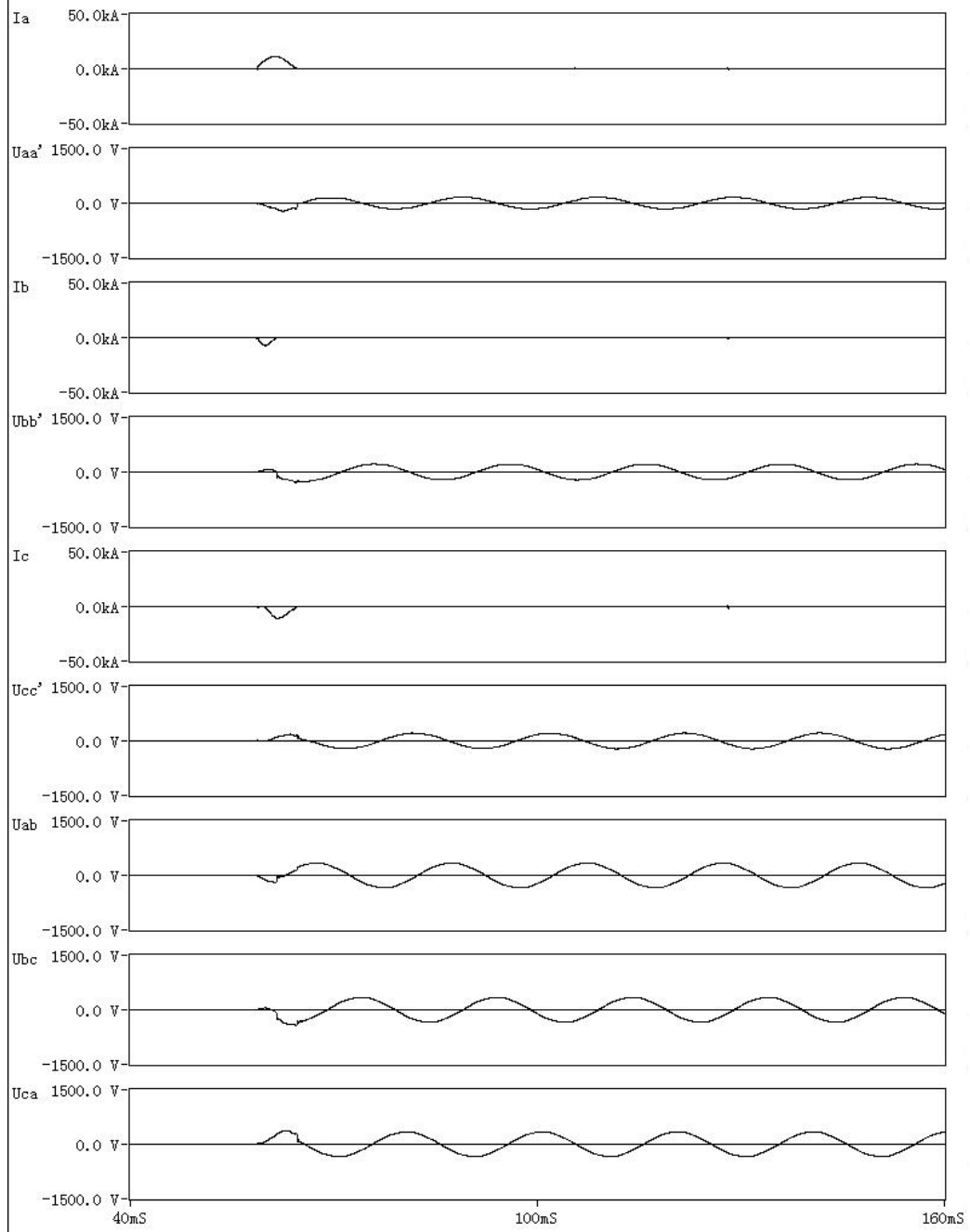
 T_{arc} A=1.701mS
 T_{arc} B=4.654mS
 T_{arc} C=4.907mS

I: prospective current 预期电流有效值 cos ϕ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#7-01



Product: MCCB
 Type: 3P/40A
 No.: #7
 Sequence: O
 I/I_p:
 25.69/53.44kA
 cos φ : 0.232

 U_t: 246.2V

 I_p A=11.040kA
 I_p B=7.465kA
 I_p C=10.972kA

 I²_t A=355.0kAAS
 I²_t B=66.17kAAS
 I²_t C=245.2kAAS

 T_{mb} A=5.800mS
 T_{mb} B=2.960mS
 T_{mb} C=4.620mS

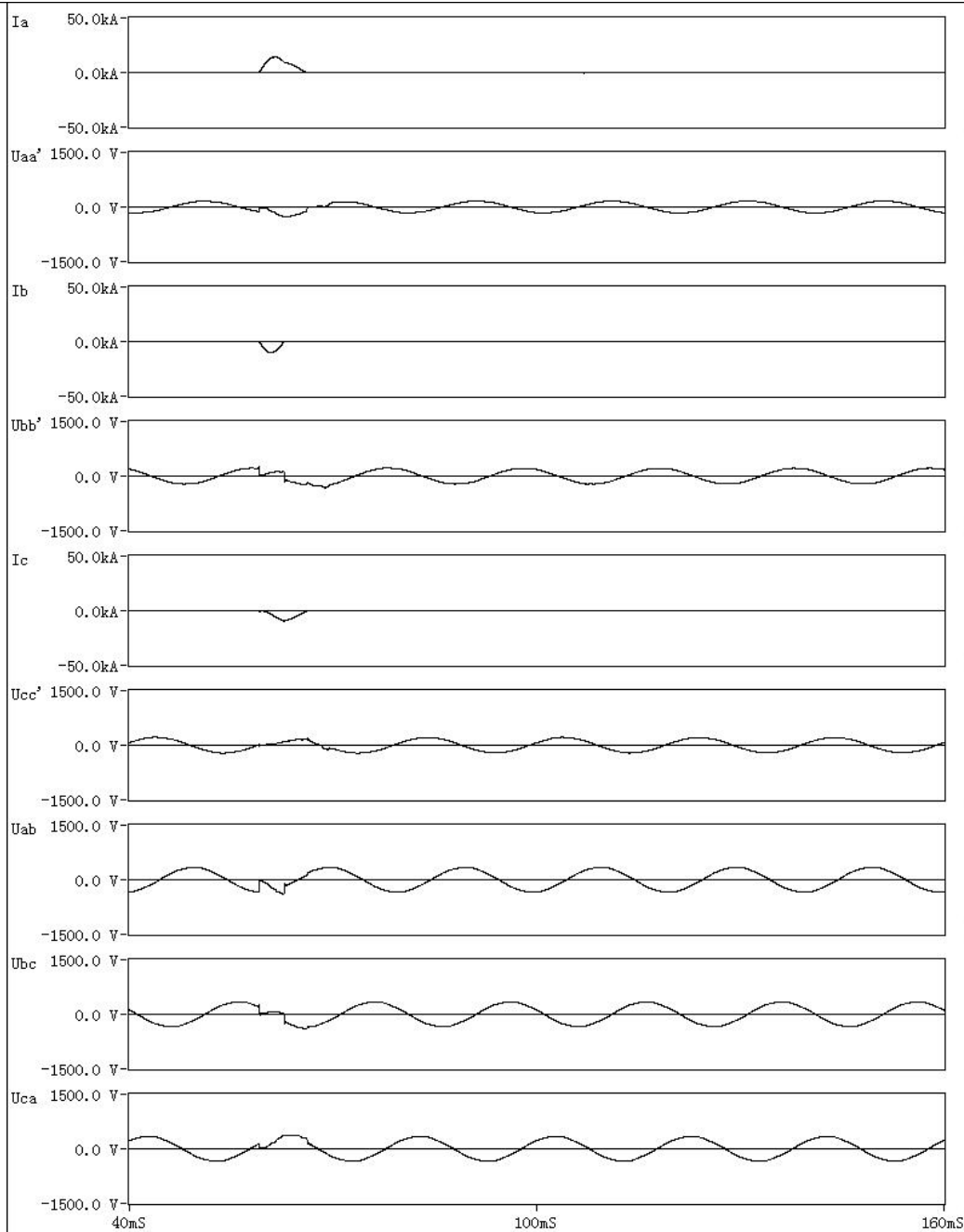
 T_{arc} A=4.900mS
 T_{arc} B=2.346mS
 T_{arc} C=3.867mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²_t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#7-02



Product: MCCB
 Type: 3P/40A
 No.: #7
 Sequence: CO
 I/I_p:
 25.69/53.44kA
 cos φ : 0.232

 U_t: 246.2V

 I_p A=14.259kA
 I_p B=10.121kA
 I_p C=9.722kA

 I²t A=564.5kAAS
 I²t B=191.8kAAS
 I²t C=224.5kAAS

 T_{mb} A=7.000mS
 T_{mb} B=3.640mS
 T_{mb} C=6.420mS

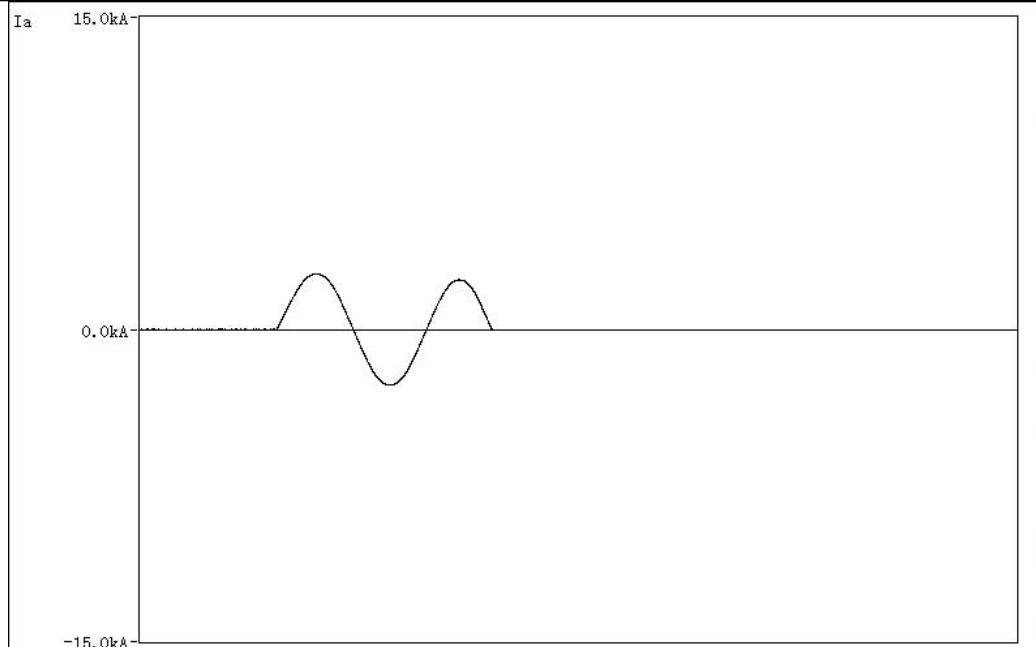
 T_{arc} A=5.953mS
 T_{arc} B=2.633mS
 T_{arc} C=4.708mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

单极短路

Oscillogram: SFA231303-#8-01



Product: MCCB
 Type: 3P/150A
 No.: #8/A
 Sequence: O
 I/I_p :
 1.878/2.651kA
 $\cos \phi$: 0.854

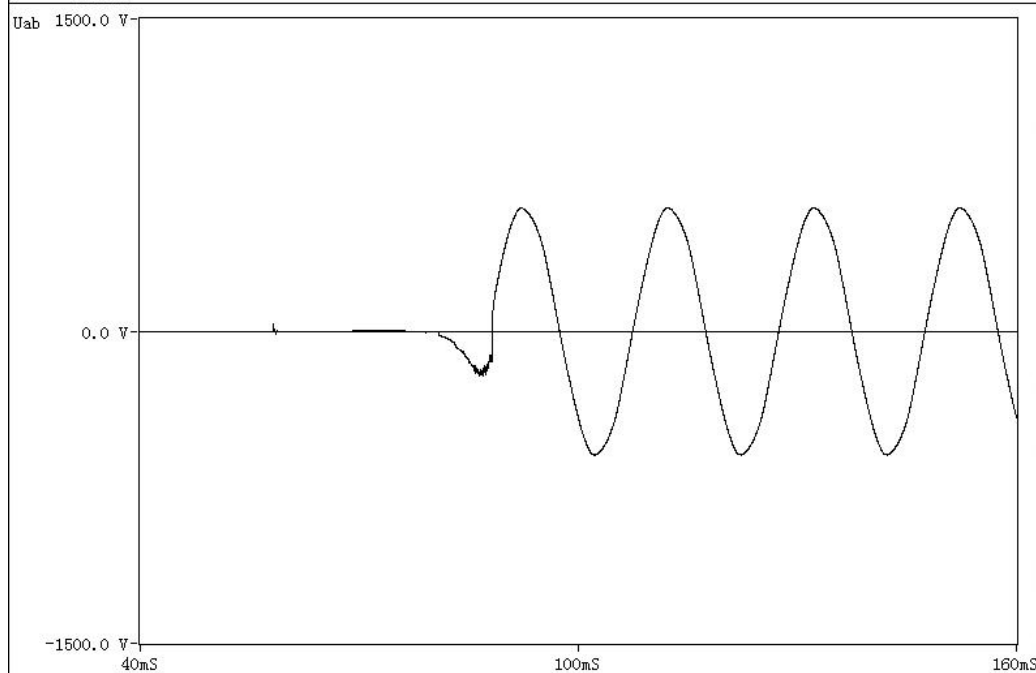
U_t : 427.1V

I_p A=2.644kA

I^2t A=98.31kAAS

T_{mb} A=29.54mS

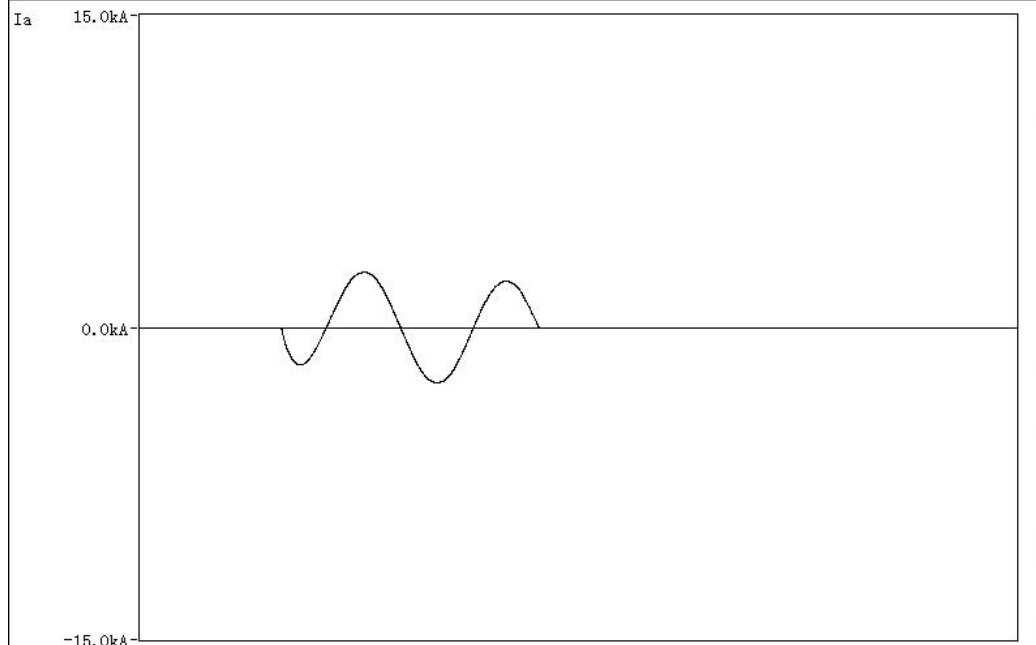
T_{arc} A=7.081mS

 U_t : 试验电压test voltage I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

IEC 60947-2

单极短路

Oscillogram: SFA231303-#8-02



Product: MCCB
 Type: 3P/150A
 No.: #8/A
 Sequence: CO
 I/I_p :
 1.878/2.651kA
 $\cos \phi$: 0.854

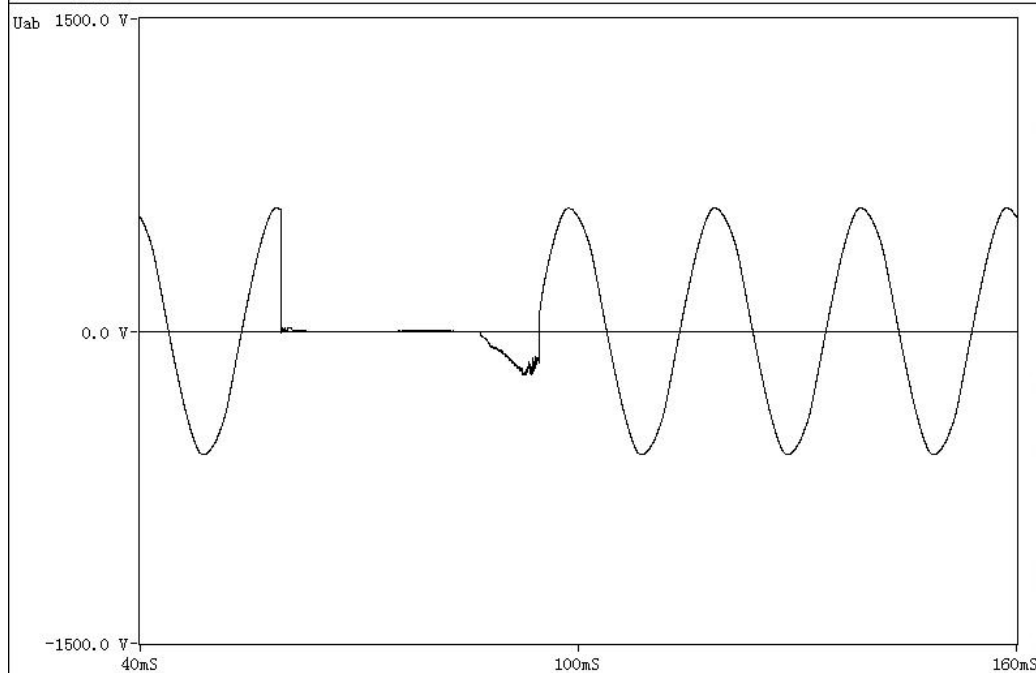
U_t : 427.1V

I_p A=2.651kA

I^2t A=103.8kAAS

T_{mb} A=35.32mS

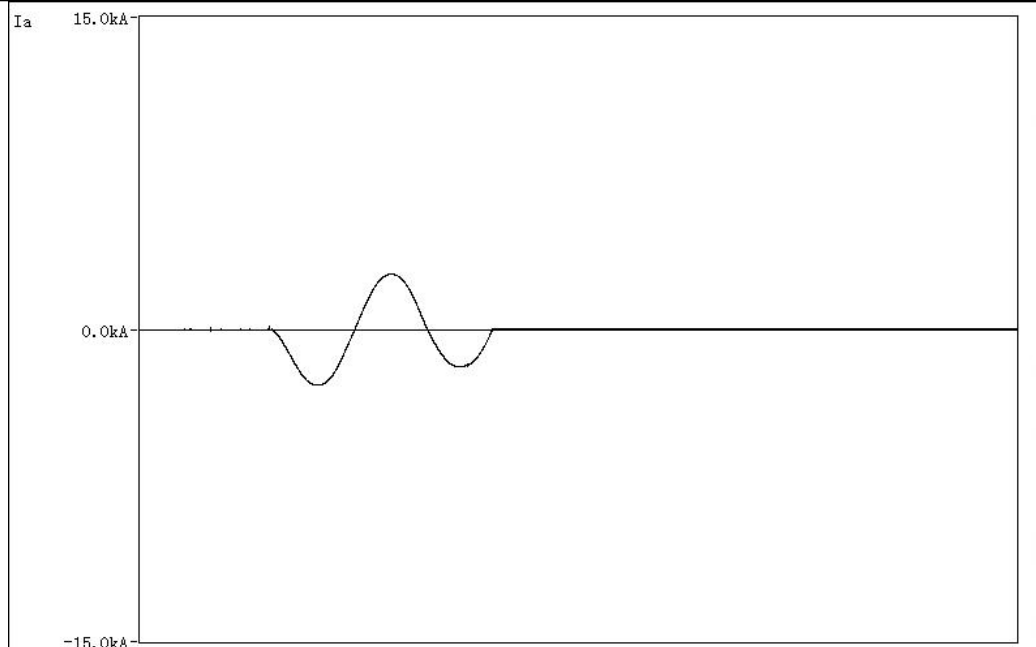
T_{arc} A=7.678mS

 U_t : 试验电压test voltage I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

IEC 60947-2

单极短路

Oscillogram: SFA231303-#8-03



Product: MCCB
 Type: 3P/150A
 No.: #8/B
 Sequence: O
 I/I_p :
 1.878/2.651kA
 $\cos \phi$: 0.854

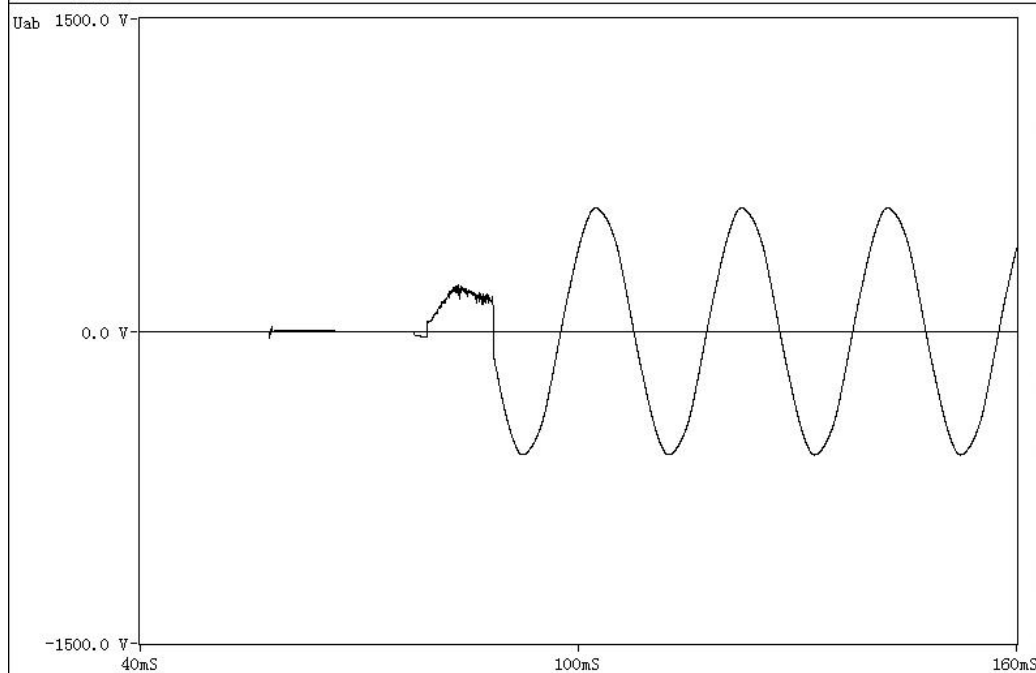
U_t : 427.1V

I_p A=2.642kA

I^2t A=89.42kAAS

T_{mb} A=30.16mS

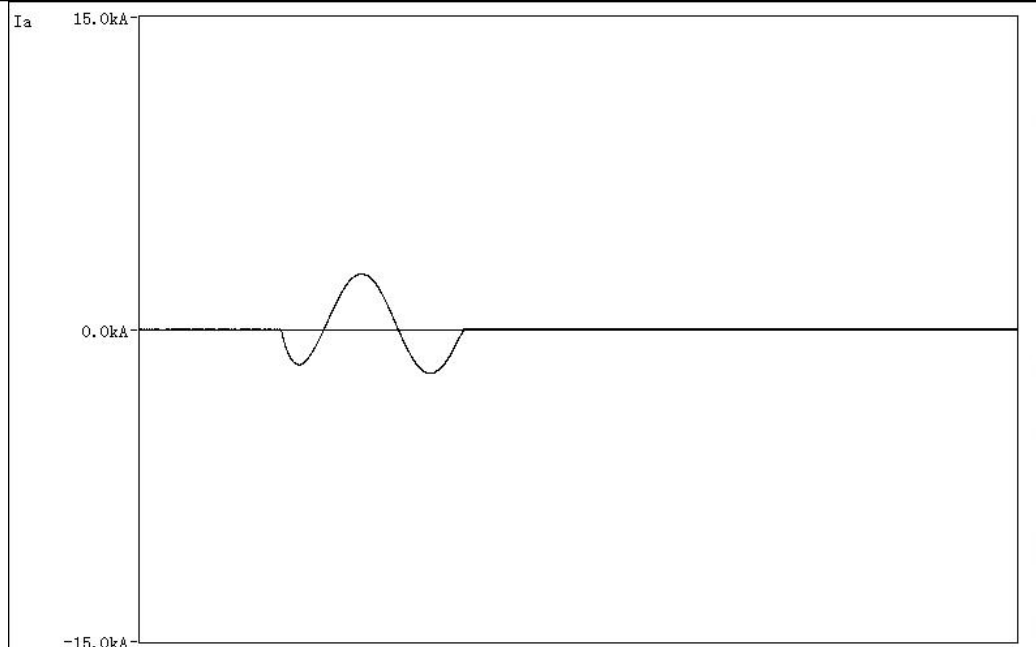
T_{arc} A=10.20mS

 U_t : 试验电压test voltage I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

IEC 60947-2

单极短路

Oscillogram: SFA231303-#8-04



Product: MCCB
 Type: 3P/150A
 No.: #8/B
 Sequence: CO
 I/I_p :
 1.878/2.651kA
 $\cos \phi$: 0.854

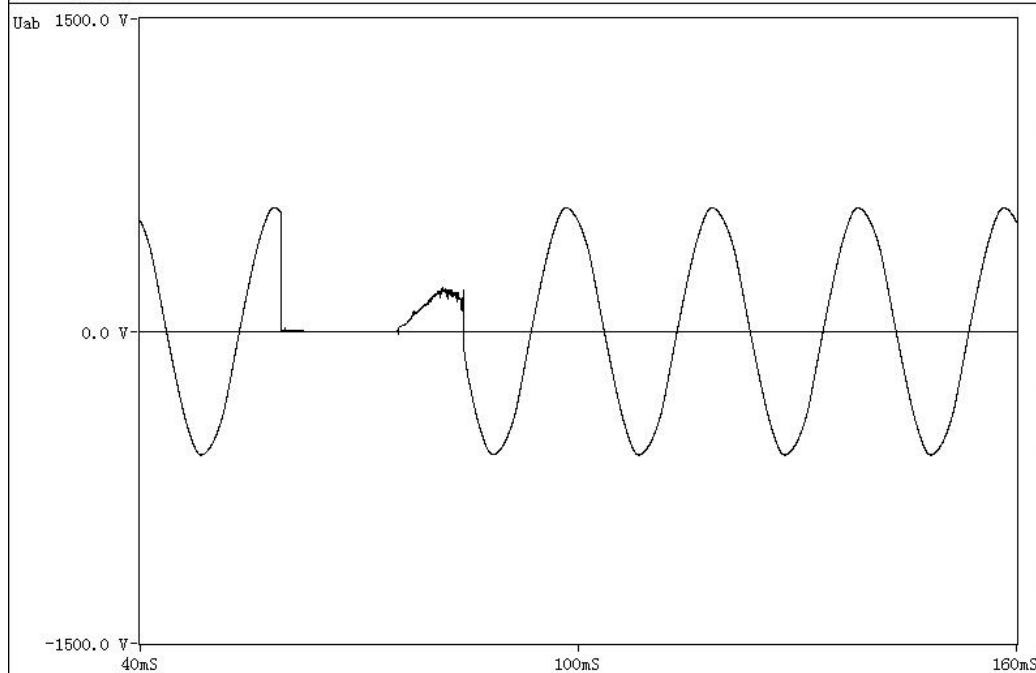
U_t : 427.1V

I_p A=2.640kA

I^2t A=64.62kAAS

T_{mb} A=24.98mS

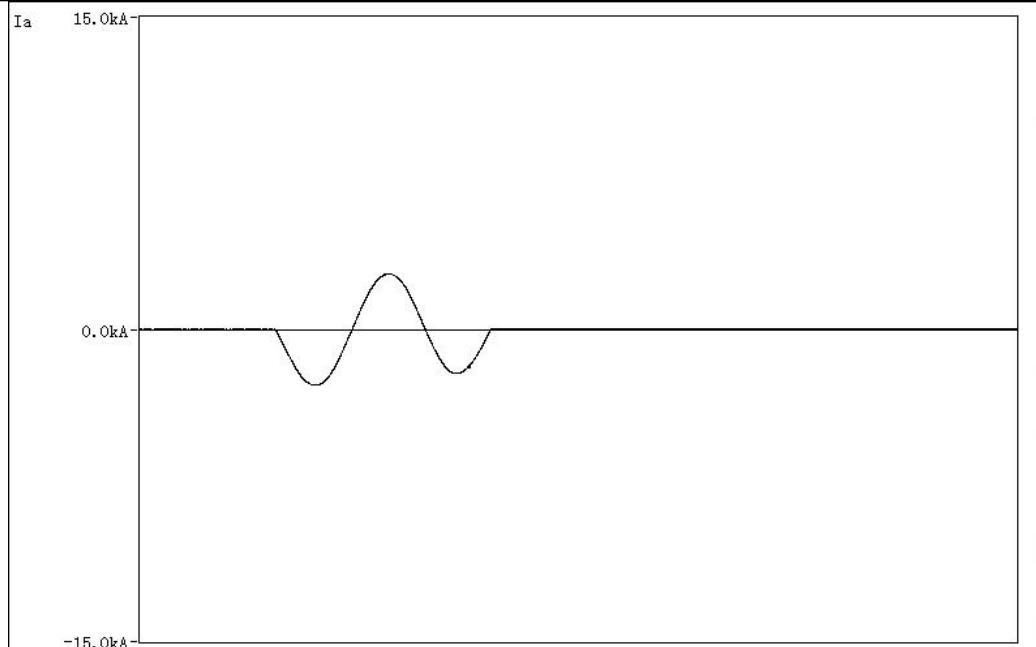
T_{arc} A=8.584mS

 U_t : 试验电压test voltage I : 预期波电流有效值prospective current $\cos \phi$: 预期波功率因数prospective power factor I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

IEC 60947-2

单极短路

Oscillogram: SFA231303-#8-05



Product: MCCB
 Type: 3P/150A
 No.: #8/C
 Sequence: O
 I/I_p :
 1.878/2.651kA
 $\cos \phi$: 0.854

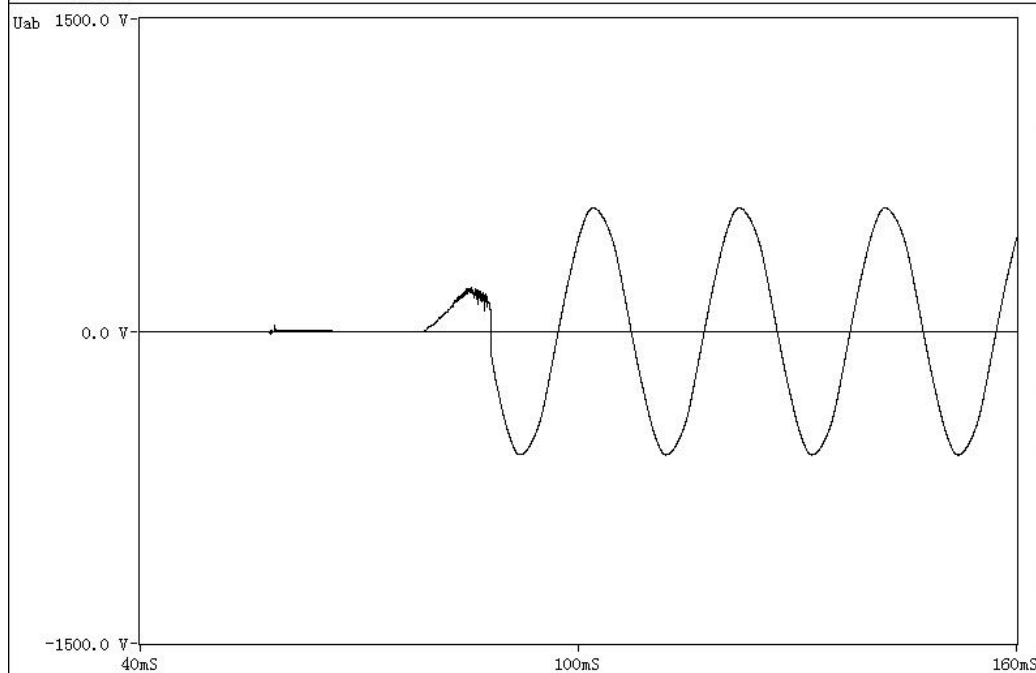
U_t : 427.1V

I_p A=2.650kA

I^2t A=93.09kAAS

T_{mb} A=29.50mS

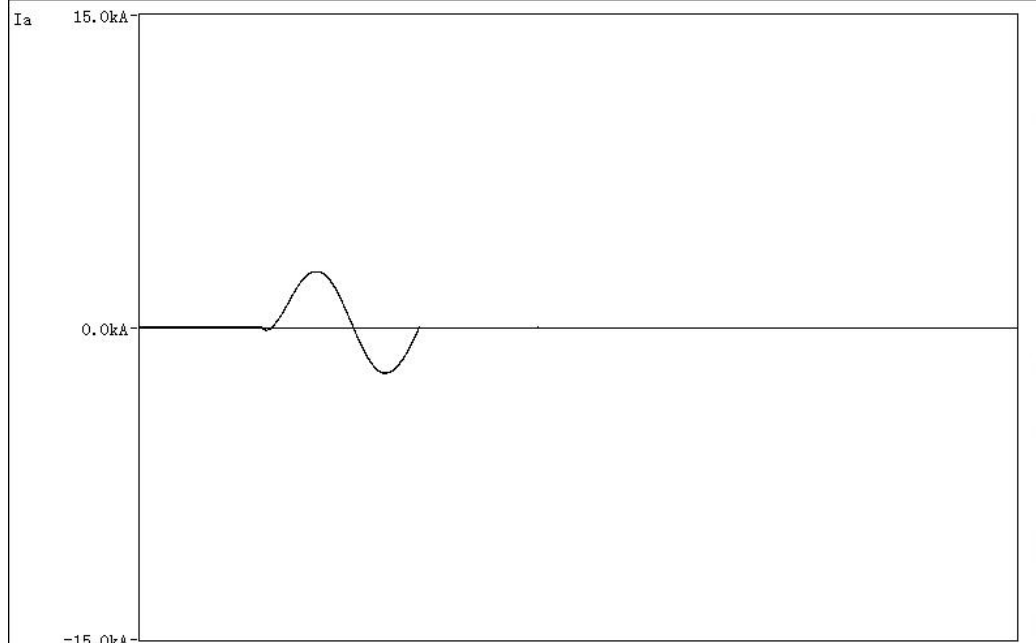
T_{arc} A=8.400mS

 U_t : 试验电压test voltage I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

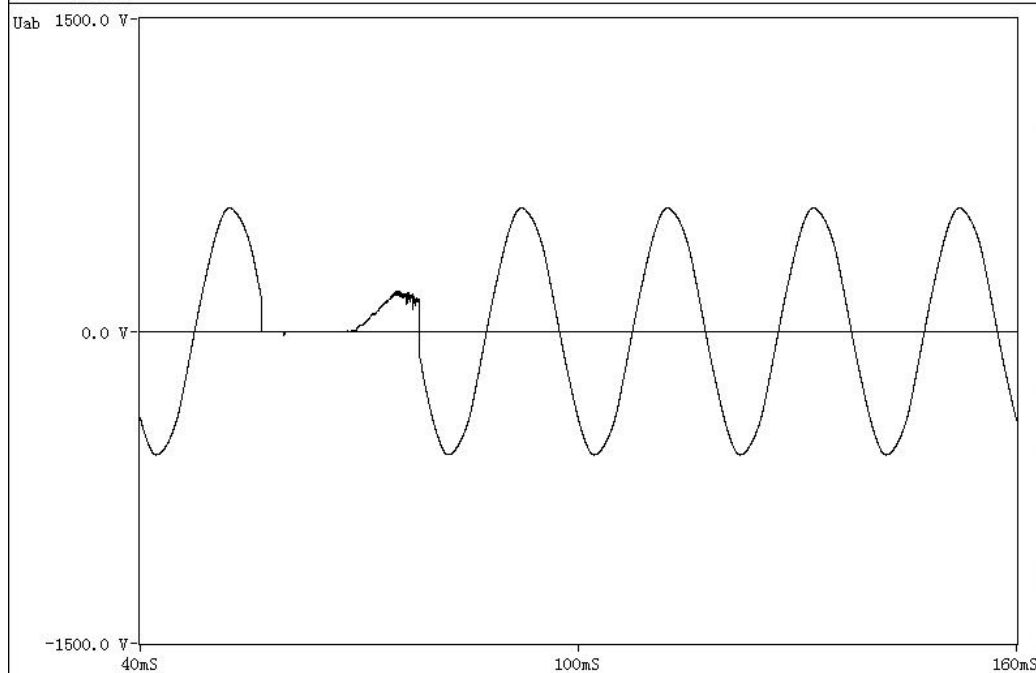
IEC 60947-2

单极短路

Oscillogram: SFA231303-#8-06



Product: MCCB
 Type: 3P/150A
 No.: #8/C
 Sequence: CO
 I/I_p:
 1.878/2.651kA
 cos φ : 0.854

U_t: 427.1VI_p A=2.648kAI²t A=60.04kAAST_{mb} A=21.54mST_{arc} A=8.307mSU_t: 试验电压test voltage

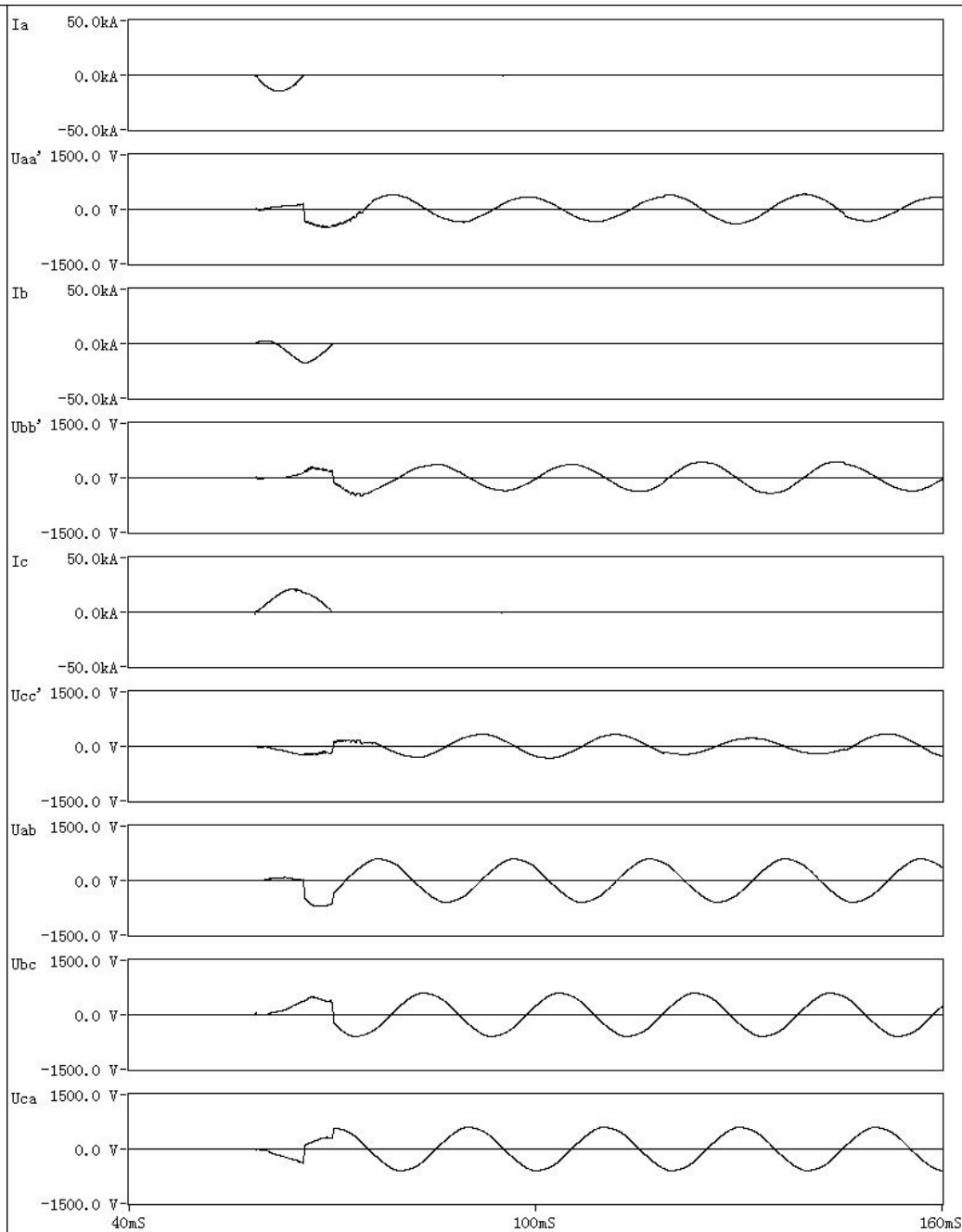
I: 预期波电流有效值prospective current current cos φ : 预期波功率因数prospective power factor

I_p: 峰值电流peak current I²t: 焦耳积分joule integral T_{mb}: 通断时间make-break time T_{arc}: 燃弧时间arcing time

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#11-01



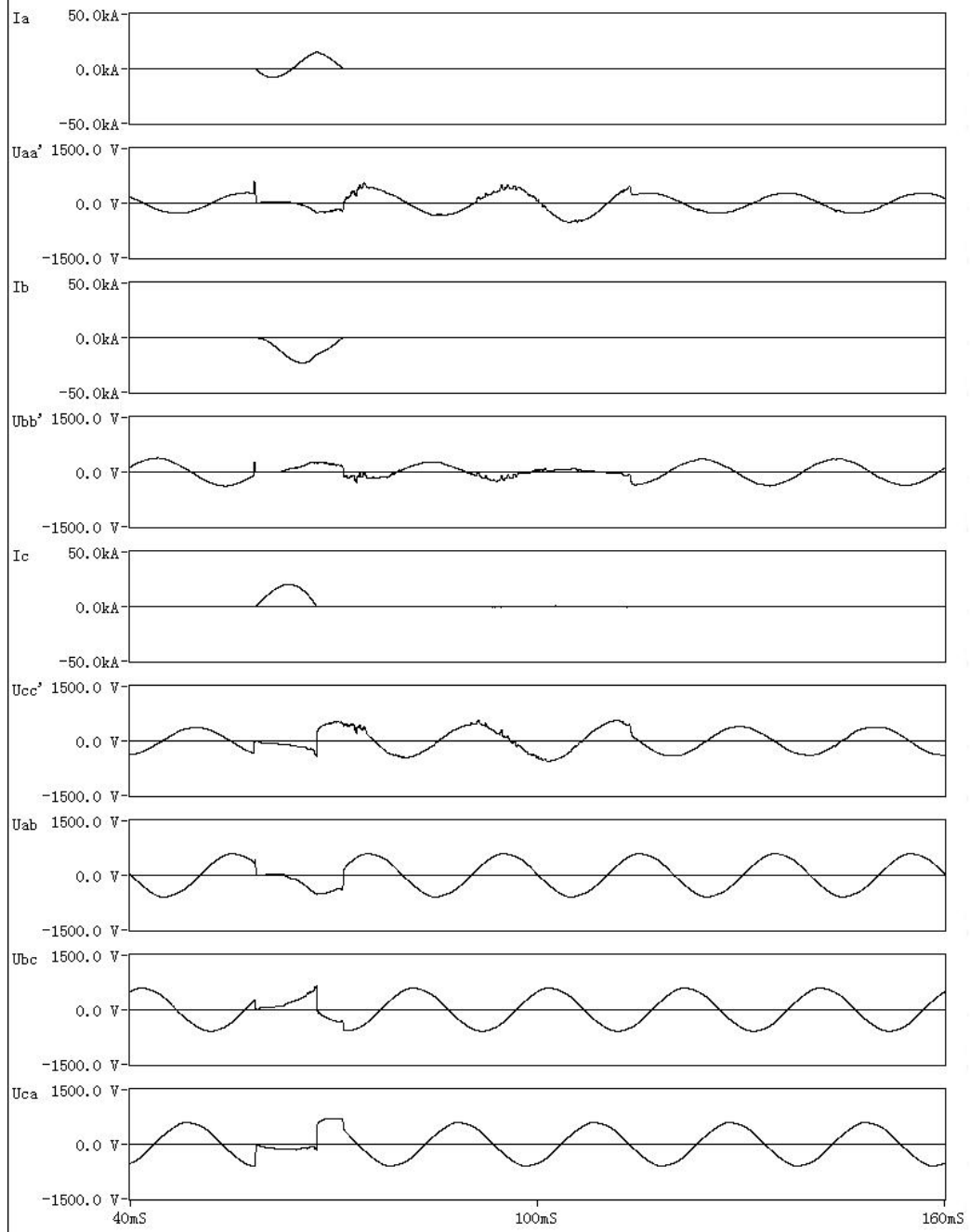
Product: MCCB
 Type: 3P/250A
 No.: #11
 Sequence: O
 I/I_p:
 15.54/31.08kA
 cos φ : 0.286
 U_t: 427.4V
 I_p A=14.707kA
 I_p B=18.091kA
 I_p C=21.125kA
 I²t A=811.3kAAS
 I²t B=1.126MAAS
 I²t C=2.322MAAS
 T_{mb} A=7.120mS
 T_{mb} B=11.38mS
 T_{mb} C=11.38mS
 T_{arc} A=5.527mS
 T_{arc} B=6.622mS
 T_{arc} C=9.534mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#11-02



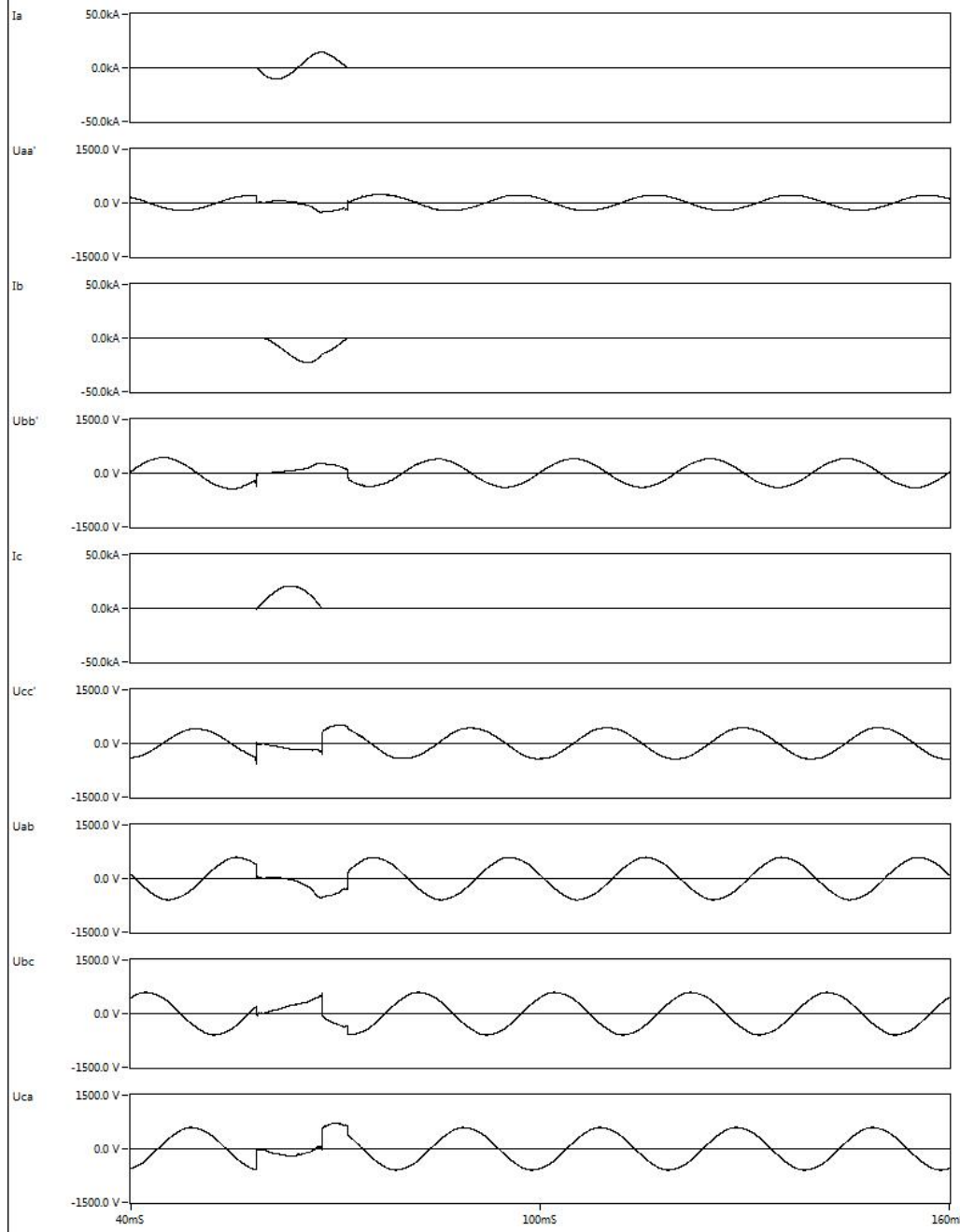
Product: MCCB
 Type: 3P/250A
 No.: #11
 Sequence: CO1
 I/I_p:
 15.54/31.08kA
 cos φ : 0.286
 U_t: 427.4V
 I_p A=15.509kA
 I_p B=23.341kA
 I_p C=20.281kA
 I²t A=909.5kAAS
 I²t B=2.637MAAS
 I²t C=1.860MAAS
 T_{mb} A=12.80mS
 T_{mb} B=12.86mS
 T_{mb} C=9.000mS
 T_{arc} A=7.629mS
 T_{arc} B=8.768mS
 T_{arc} C=8.199mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#11-03



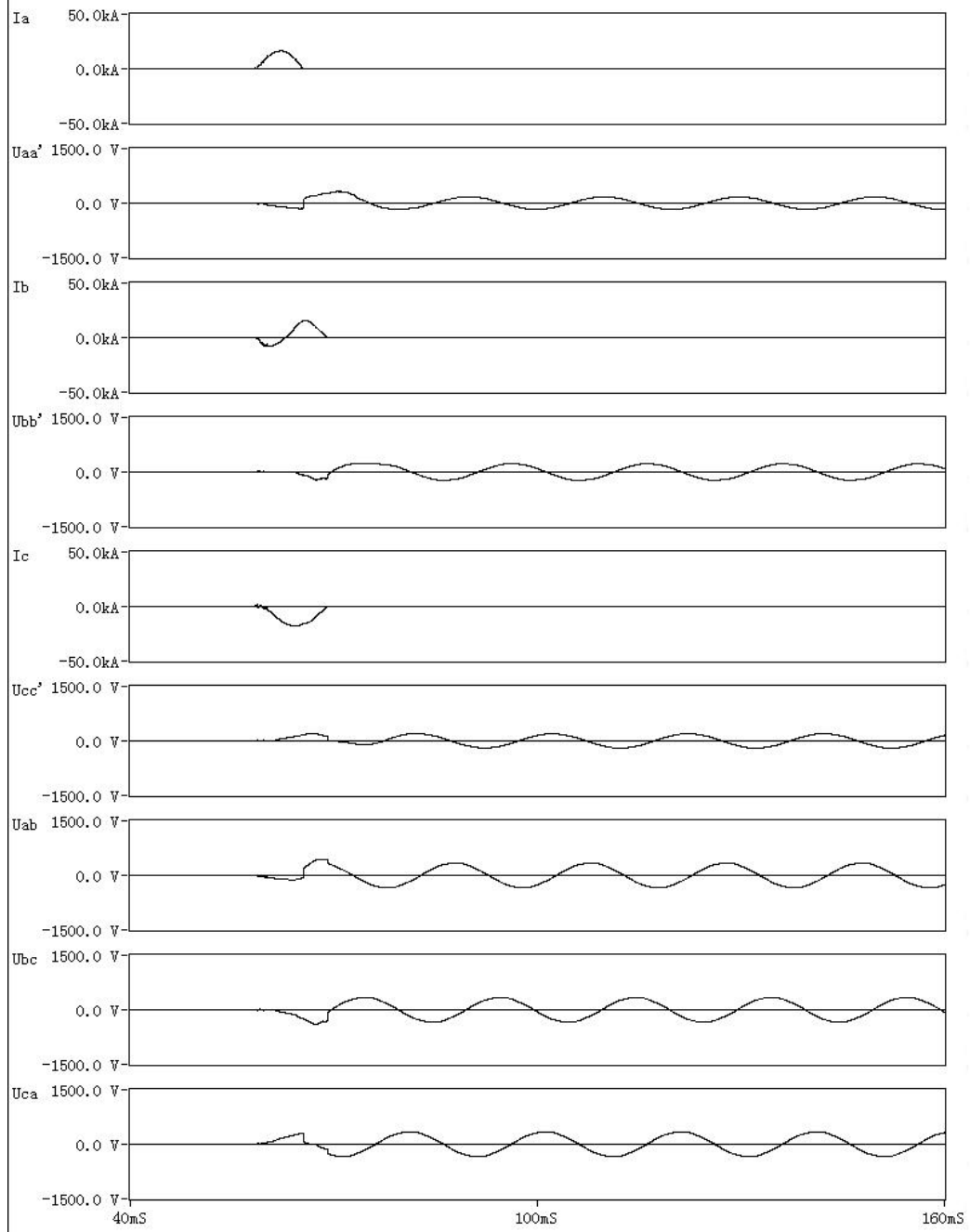
Product: MCCB
 Type: 3P/250A
 No.: #11
 Sequence: CO2
 I/I_p:
 15.54/31.08kA
 cos φ : 0.286
 U_t: 427.4V
 I_p A=15.222kA
 I_p B=23.097kA
 I_p C=21.021kA
 I²t A=1.061MAAS
 I²t B=2.582MAAS
 I²t C=2.126MAAS
 T_{mb} A=13.24mS
 T_{mb} B=12.30mS
 T_{mb} C=9.520mS
 T_{arc} A=10.58mS
 T_{arc} B=8.915mS
 T_{arc} C=7.241mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因素
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#12-01



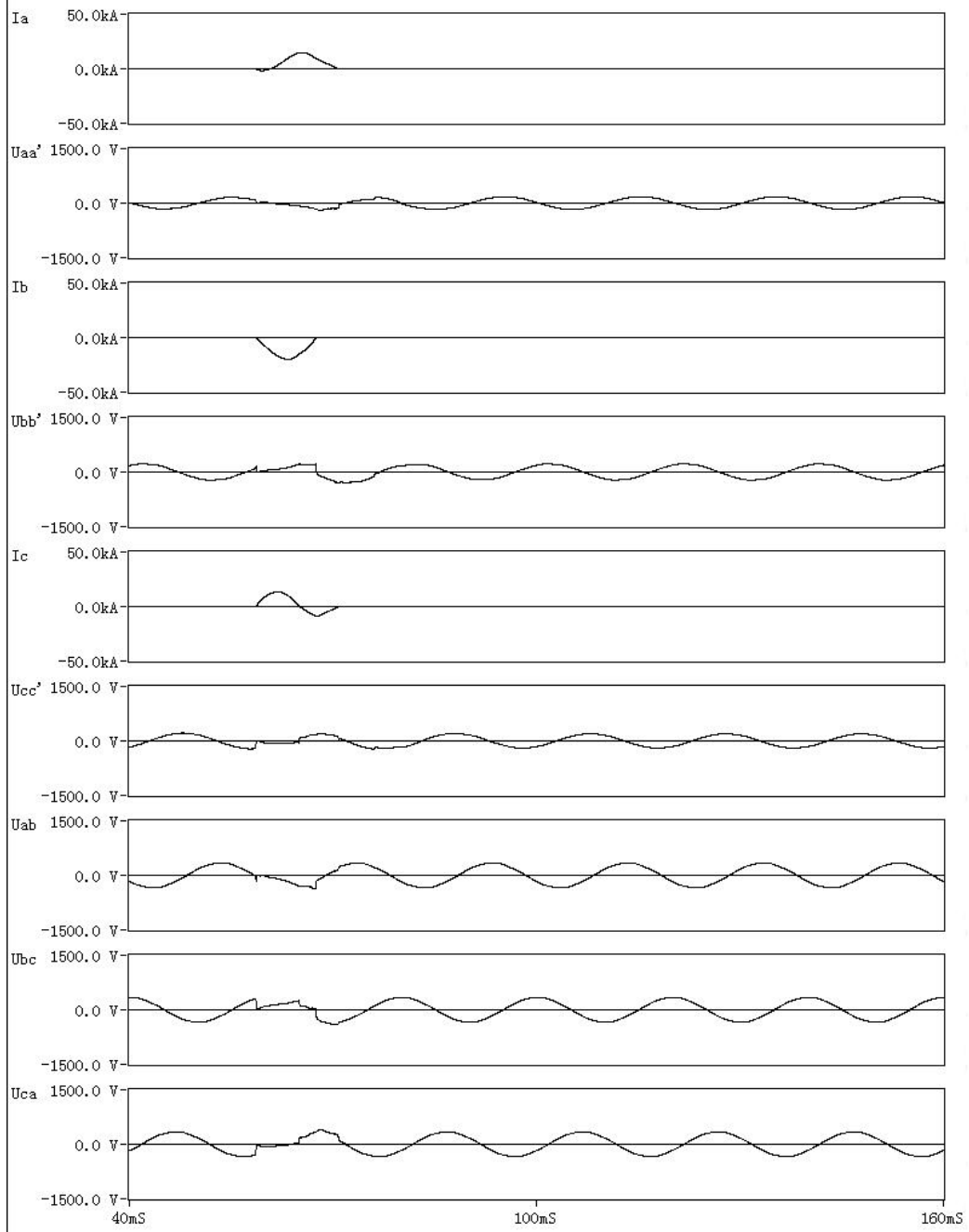
Product: MCCB
 Type: 3P/250A
 No.: #12
 Sequence: O
 I/I_p:
 20.35/41.44kA
 cos φ : 0.275
 U_t: 242.7V
 I_p A=16.258kA
 I_p B=15.787kA
 I_p C=17.973kA
 I²t A=905.3kAAS
 I²t B=782.8kAAS
 I²t C=1.457MAAS
 T_{mb} A=6.980mS
 T_{mb} B=10.26mS
 T_{mb} C=8.860mS
 T_{arc} A=5.587mS
 T_{arc} B=4.570mS
 T_{arc} C=7.608mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#12-02



Product: MCCB
 Type: 3P/250A
 No.: #12
 Sequence: CO1
 I/I_p:
 20.35/41.44kA
 cos φ : 0.275

 U_t: 242.7V

 I_p A=14.946kA
 I_p B=19.903kA
 I_p C=13.312kA

 I²_t A=865.6kAAS
 I²_t B=1.677MAAS
 I²_t C=771.4kAAS

 T_{mb} A=12.08mS
 T_{mb} B=8.800mS
 T_{mb} C=12.06mS

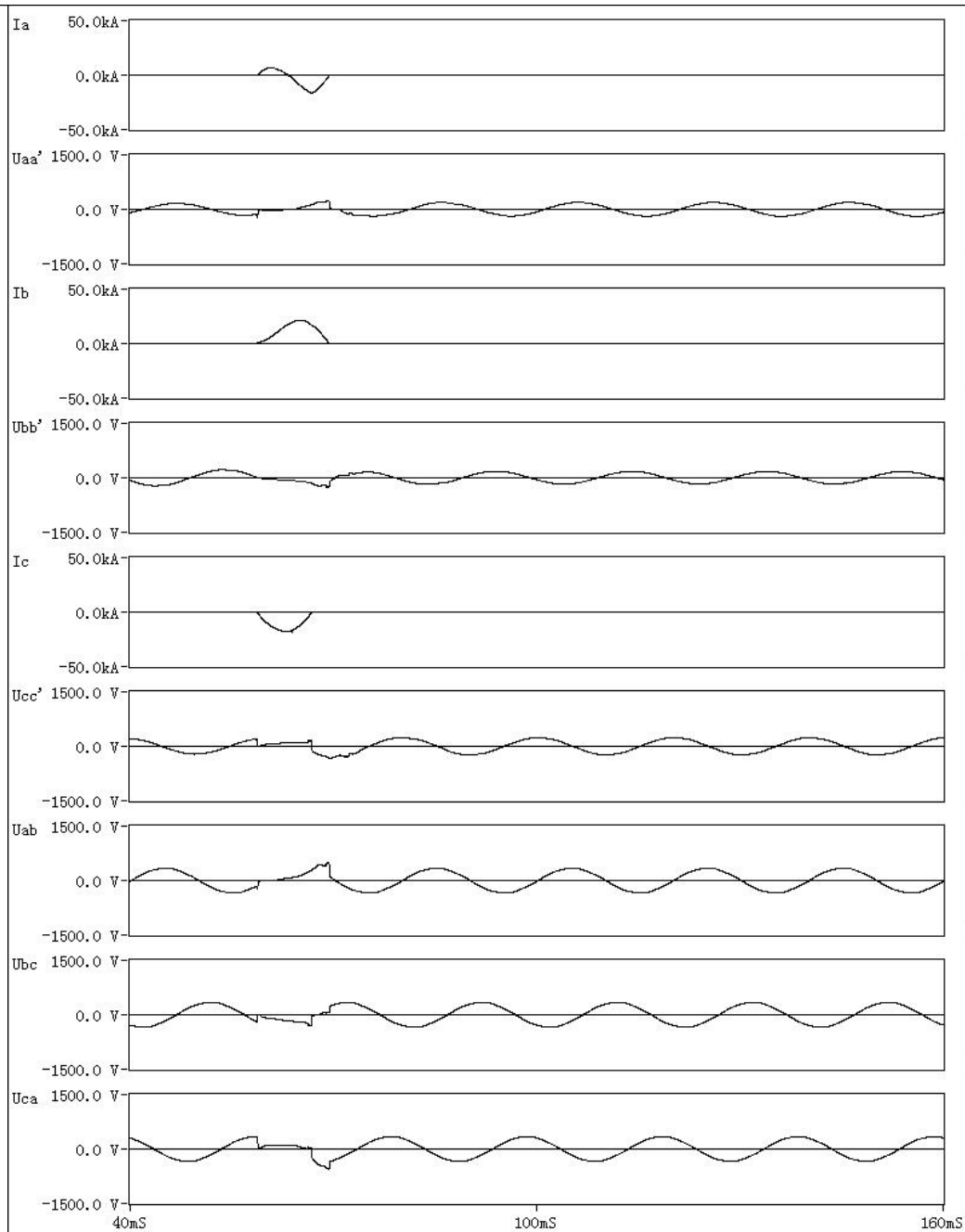
 T_{arc} A=8.841mS
 T_{arc} B=7.900mS
 T_{arc} C=11.25mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²_t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#12-03



Product: MCCB
 Type: 3P/250A
 No.: #12
 Sequence: CO2
 I/I_p:
 20.35/41.44kA
 cos φ : 0.275

U_t: 242.7V

I_p A=16.675kA
 I_p B=21.568kA
 I_p C=19.441kA

I²t A=776.2kAAS
 I²t B=2.124MAAS
 I²t C=1.342MAAS

T_{mb} A=10.52mS
 T_{mb} B=10.64mS
 T_{mb} C=8.080mS

T_{arc} A=9.613mS
 T_{arc} B=7.968mS
 T_{arc} C=7.413mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数

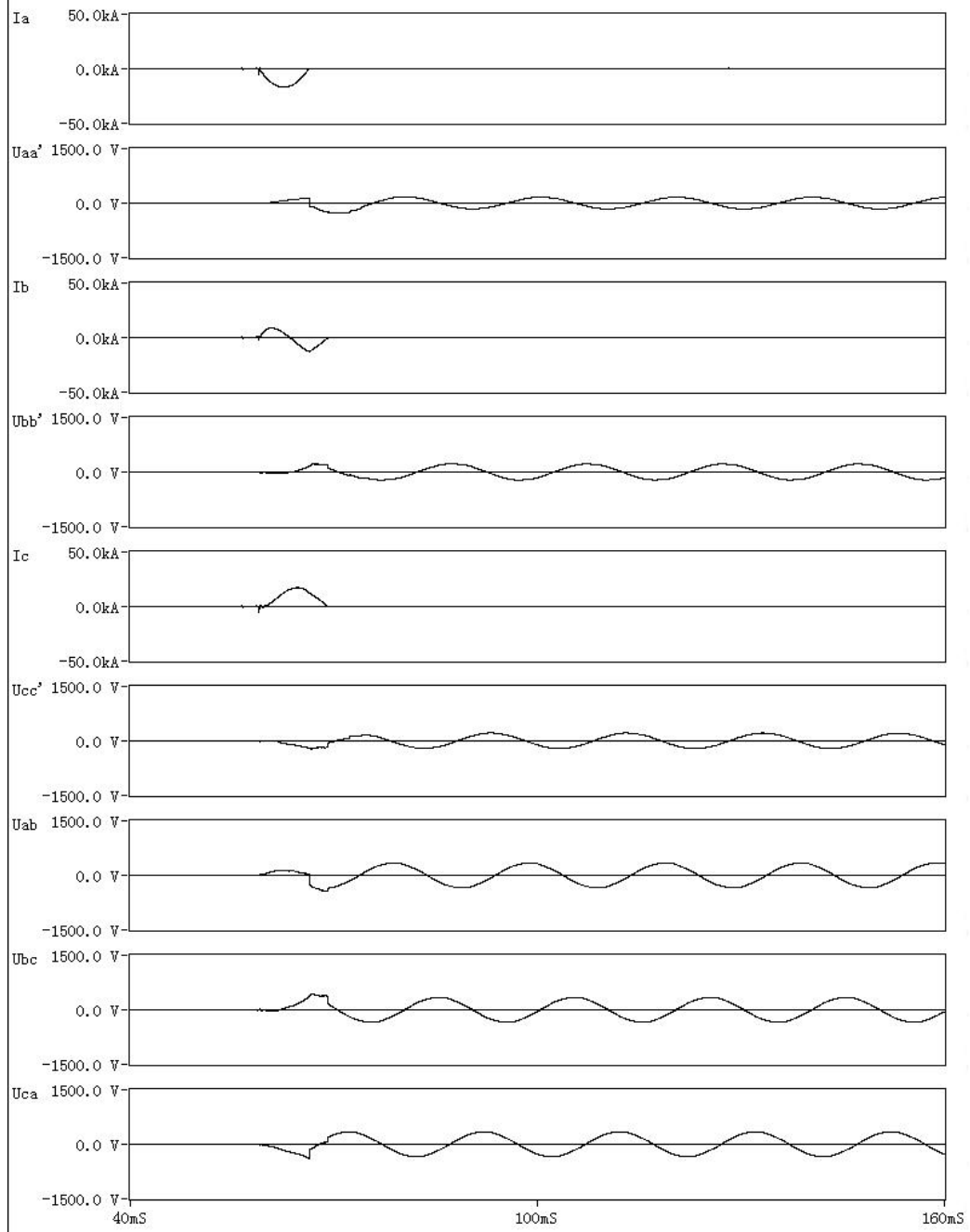
U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量

T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#13-01



Product: MCCB
 Type: 3P/125A
 No.: #13
 Sequence: O
 I/I_p:
 20.35/41.44kA
 cos φ : 0.275

 U_t: 242.7V

 I_p A=17.050kA
 I_p B=12.840kA
 I_p C=17.312kA

 I²t A=1.124MAAS
 I²t B=523.8kAAS
 I²t C=1.217MAAS

 T_{mb} A=7.640mS
 T_{mb} B=10.10mS
 T_{mb} C=9.220mS

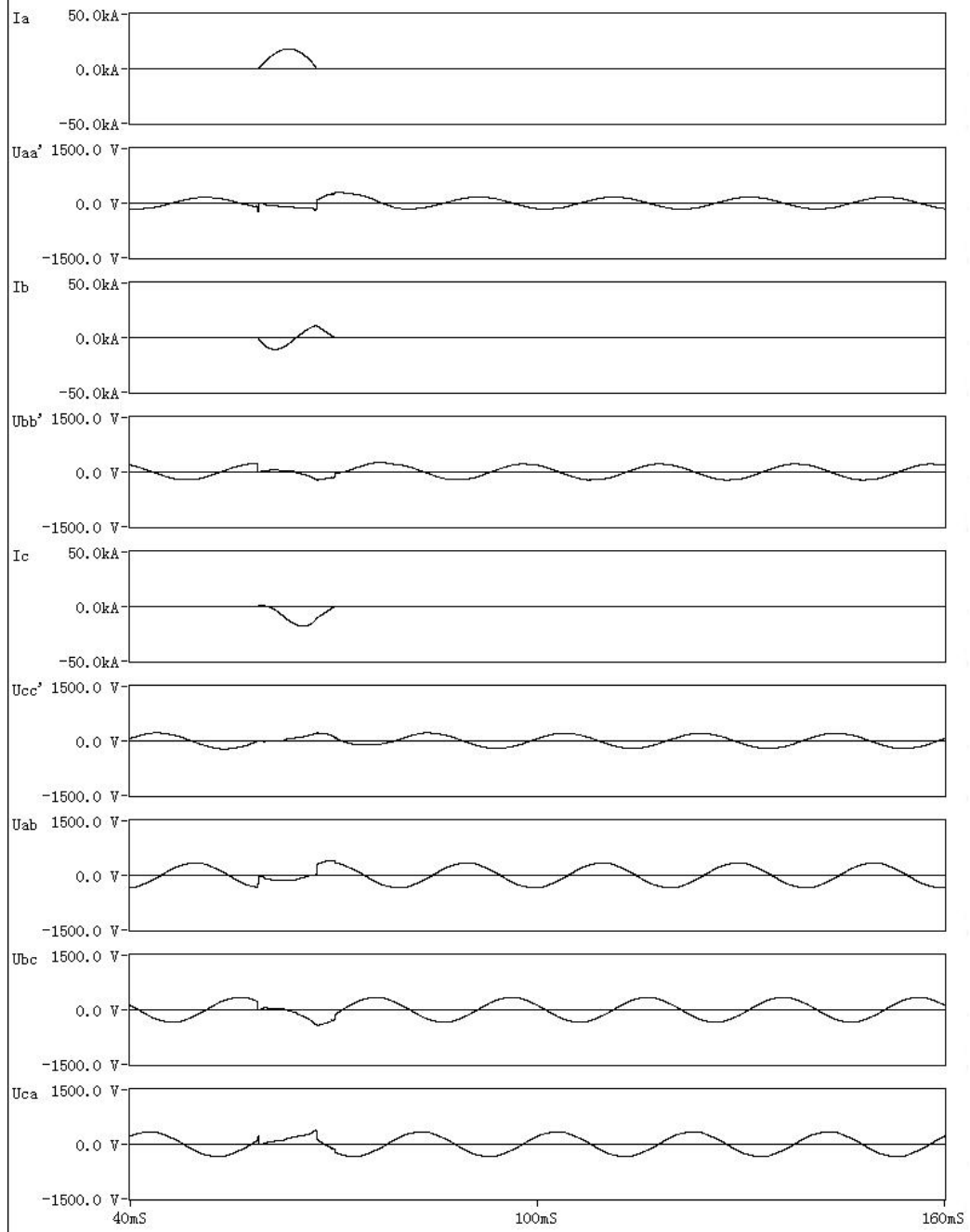
 T_{arc} A=5.687mS
 T_{arc} B=9.353mS
 T_{arc} C=7.201mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#13-02



Product: MCCB
 Type: 3P/125A
 No.: #13
 Sequence: CO1
 I/I_p:
 20.35/41.44kA
 cos φ : 0.275

 U_t: 242.7V

 I_p A=18.196kA
 I_p B=10.965kA
 I_p C=18.129kA

 I²_t A=1.470MAAS
 I²_t B=608.8kAAS
 I²_t C=1.327MAAS

 T_{mb} A=8.560mS
 T_{mb} B=11.30mS
 T_{mb} C=11.32mS

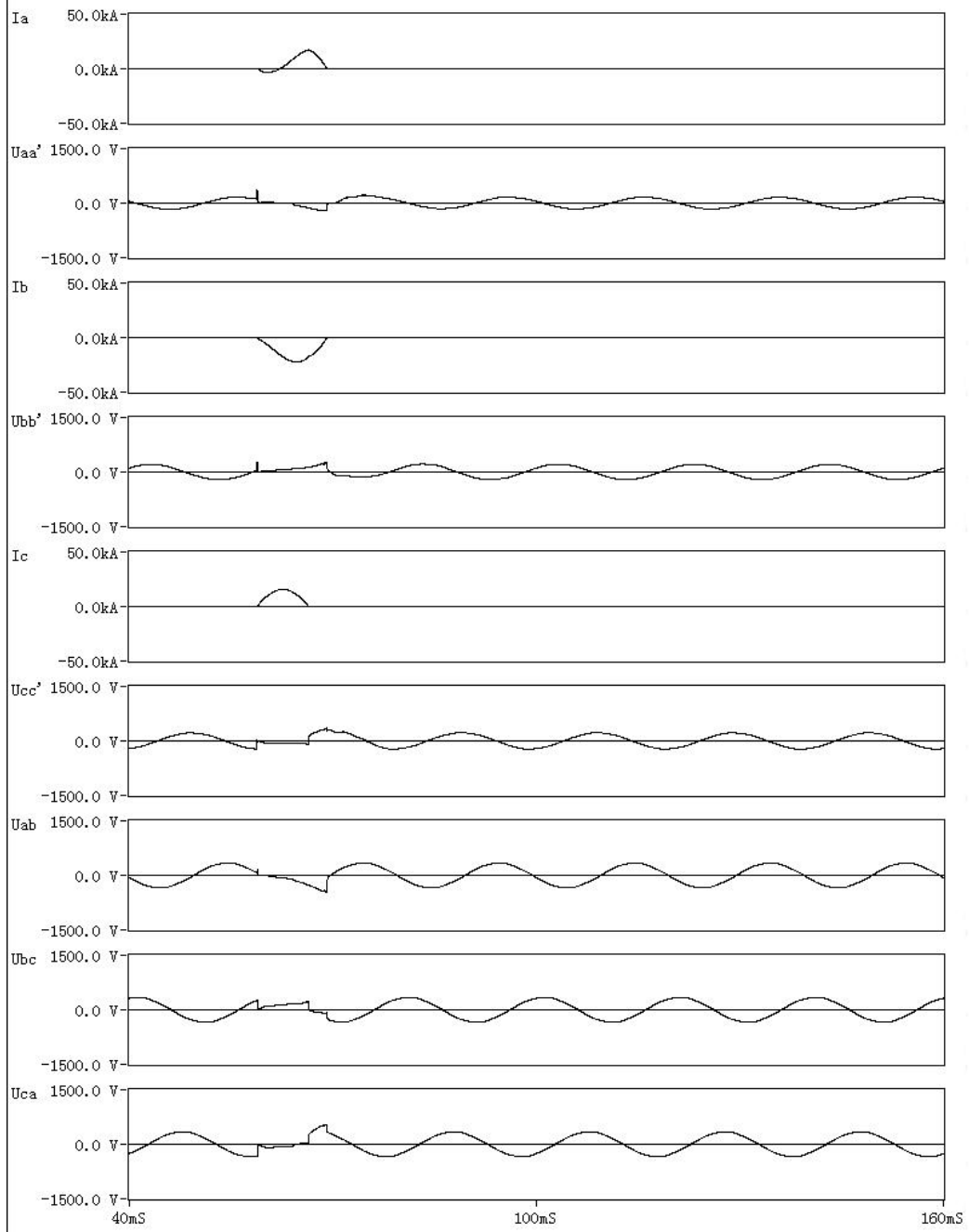
 T_{arc} A=7.480mS
 T_{arc} B=10.10mS
 T_{arc} C=7.209mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²_t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定运行短路分断能力

Oscillogram: SFA231303-#13-03



Product: MCCB
 Type: 3P/125A
 No.: #13
 Sequence: CO2
 I/I_p:
 20.35/41.44kA
 cos φ : 0.275

 U_t: 242.7V

 I_p A=17.321kA
 I_p B=22.529kA
 I_p C=15.843kA

 I²t A=878.7kAAS
 I²t B=2.414MAAS
 I²t C=971.4kAAS

 T_{mb} A=10.16mS
 T_{mb} B=10.26mS
 T_{mb} C=7.560mS

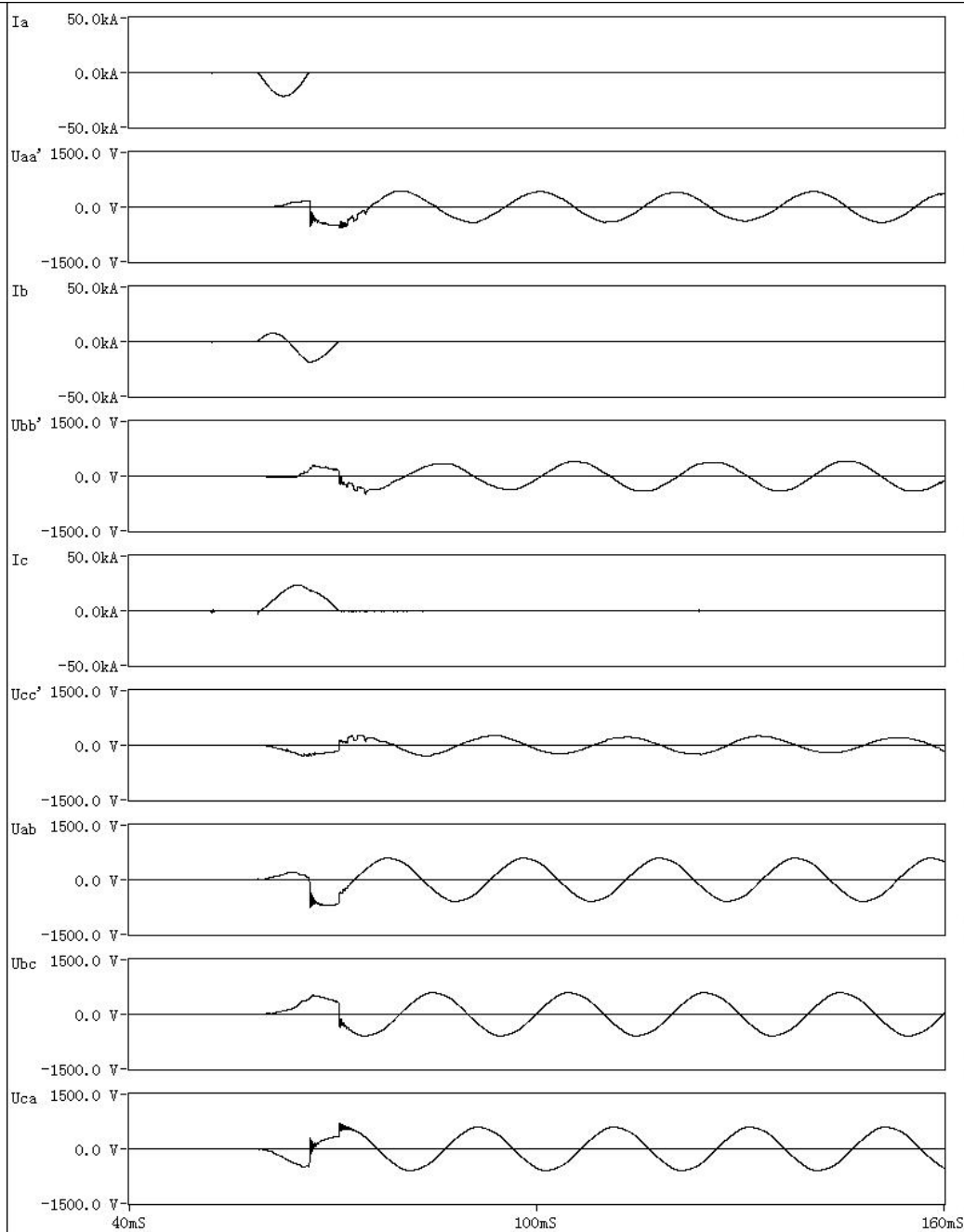
 T_{arc} A=5.069mS
 T_{arc} B=8.614mS
 T_{arc} C=6.673mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#14-01



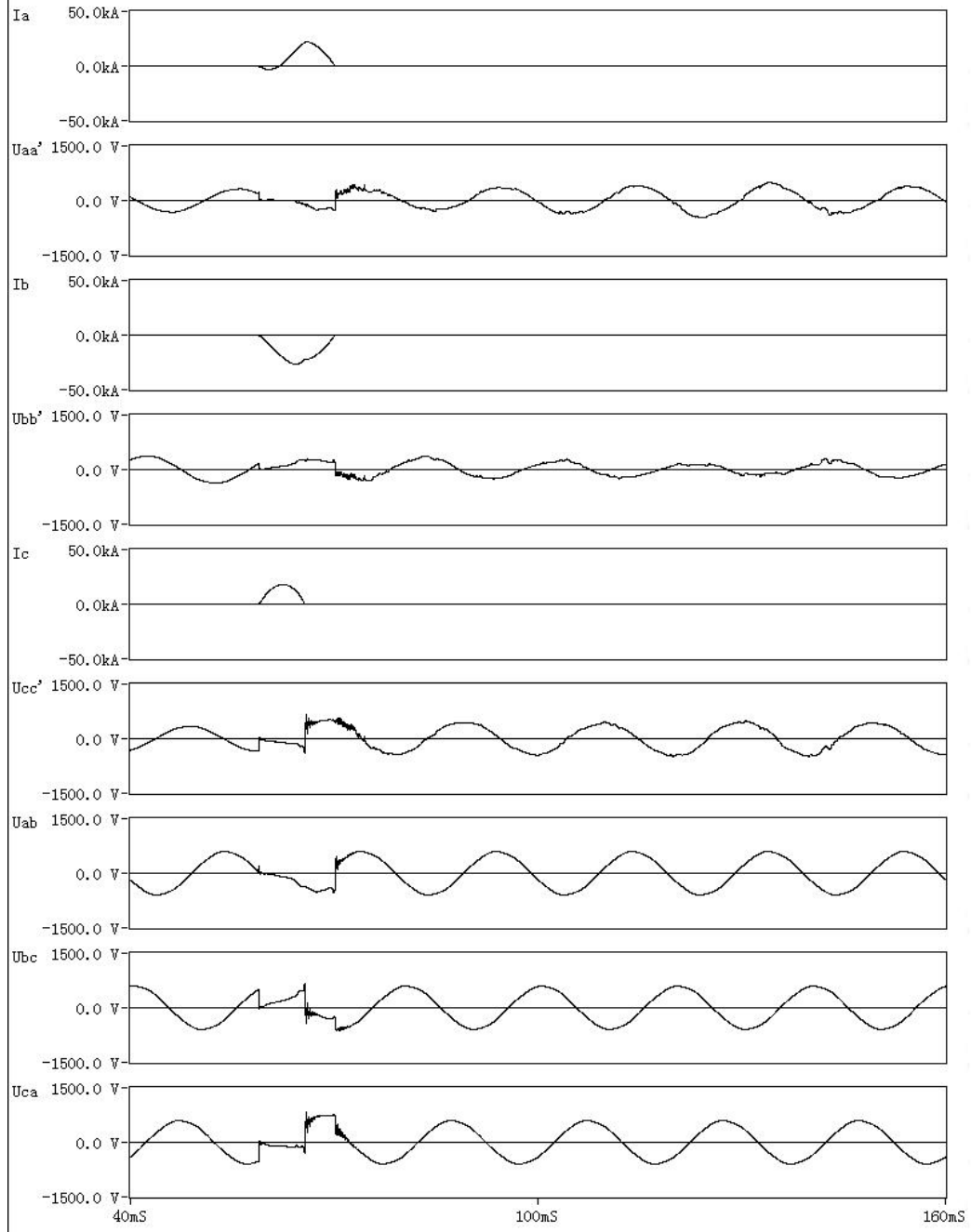
Product: MCCB
 Type: 3P/250A
 No.: #14
 Sequence: O
 I/I_p:
 20.56/41.39kA
 cos φ : 0.273
 U_t: 427.9V
 I_p A=21.768kA
 I_p B=19.278kA
 I_p C=23.750kA
 I²t A=1.769MAAS
 I²t B=1.304MAAS
 I²t C=2.806MAAS
 T_{mb} A=7.500mS
 T_{mb} B=11.86mS
 T_{mb} C=11.58mS
 T_{arc} A=4.561mS
 T_{arc} B=5.990mS
 T_{arc} C=9.914mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#14-02



Product: MCCB
 Type: 3P/250A
 No.: #14
 Sequence: CO
 I/I_p:
 20.56/41.39kA
 cos φ : 0.273

 U_t: 427.9V

 I_p A=22.195kA
 I_p B=26.810kA
 I_p C=18.031kA

 I²t A=1.715MAAS
 I²t B=3.596MAAS
 I²t C=1.170MAAS

 T_{mb} A=11.06mS
 T_{mb} B=11.10mS
 T_{mb} C=6.800mS

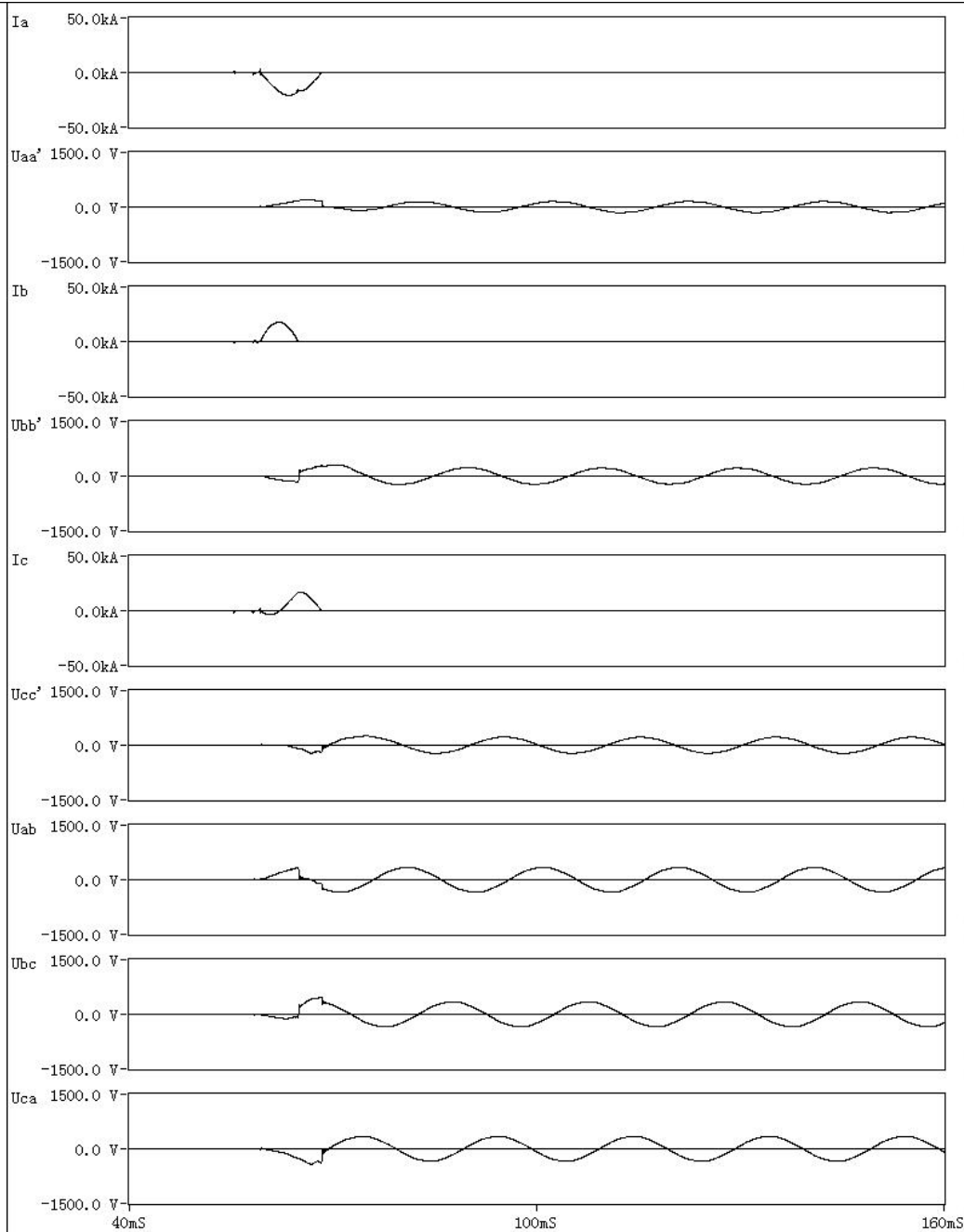
 T_{arc} A=5.796mS
 T_{arc} B=10.10mS
 T_{arc} C=5.720mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#15-01



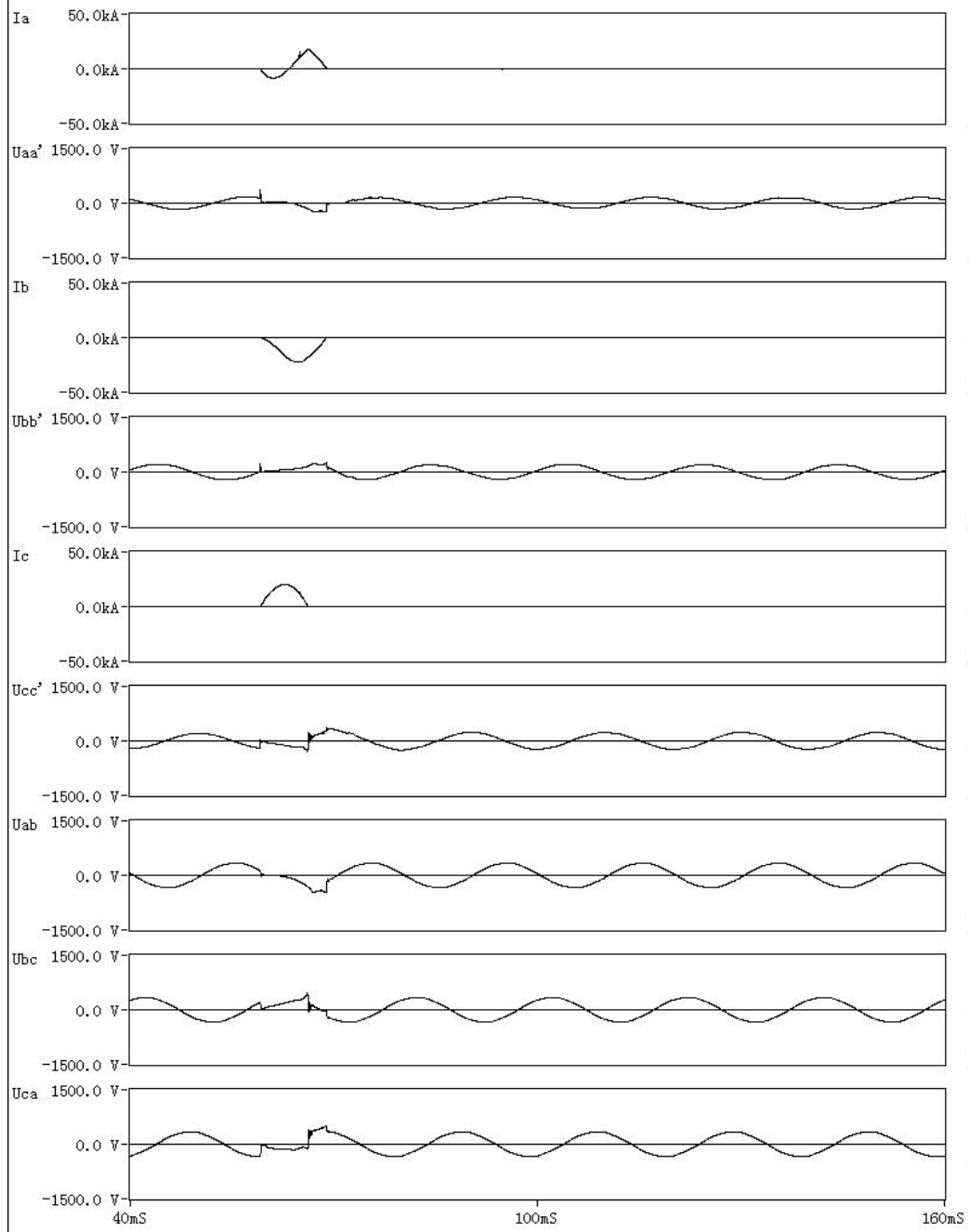
Product: MCCB
 Type: 3P/250A
 No.: #15
 Sequence: O
 I/I_p:
 25.69/53.44kA
 cos φ : 0.232
 U_t: 246.2V
 I_p A=20.987kA
 I_p B=17.818kA
 I_p C=17.187kA
 I²t A=1.905MAAS
 I²t B=924.7kAAS
 I²t C=773.2kAAS
 T_{mb} A=9.000mS
 T_{mb} B=5.540mS
 T_{mb} C=8.920mS
 T_{arc} A=7.794mS
 T_{arc} B=4.753mS
 T_{arc} C=5.009mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#15-02



Product: MCCB
 Type: 3P/250A
 No.: #15
 Sequence: CO
 I/I_p:
 25.69/53.44kA
 cos φ : 0.232

 U_t: 246.2V

 I_p A=17.758kA
 I_p B=22.622kA
 I_p C=20.062kA

 I²t A=837.3kAAS
 I²t B=2.098MAAS
 I²t C=1.483MAAS

 T_{mb} A=9.720mS
 T_{mb} B=9.560mS
 T_{mb} C=6.960mS

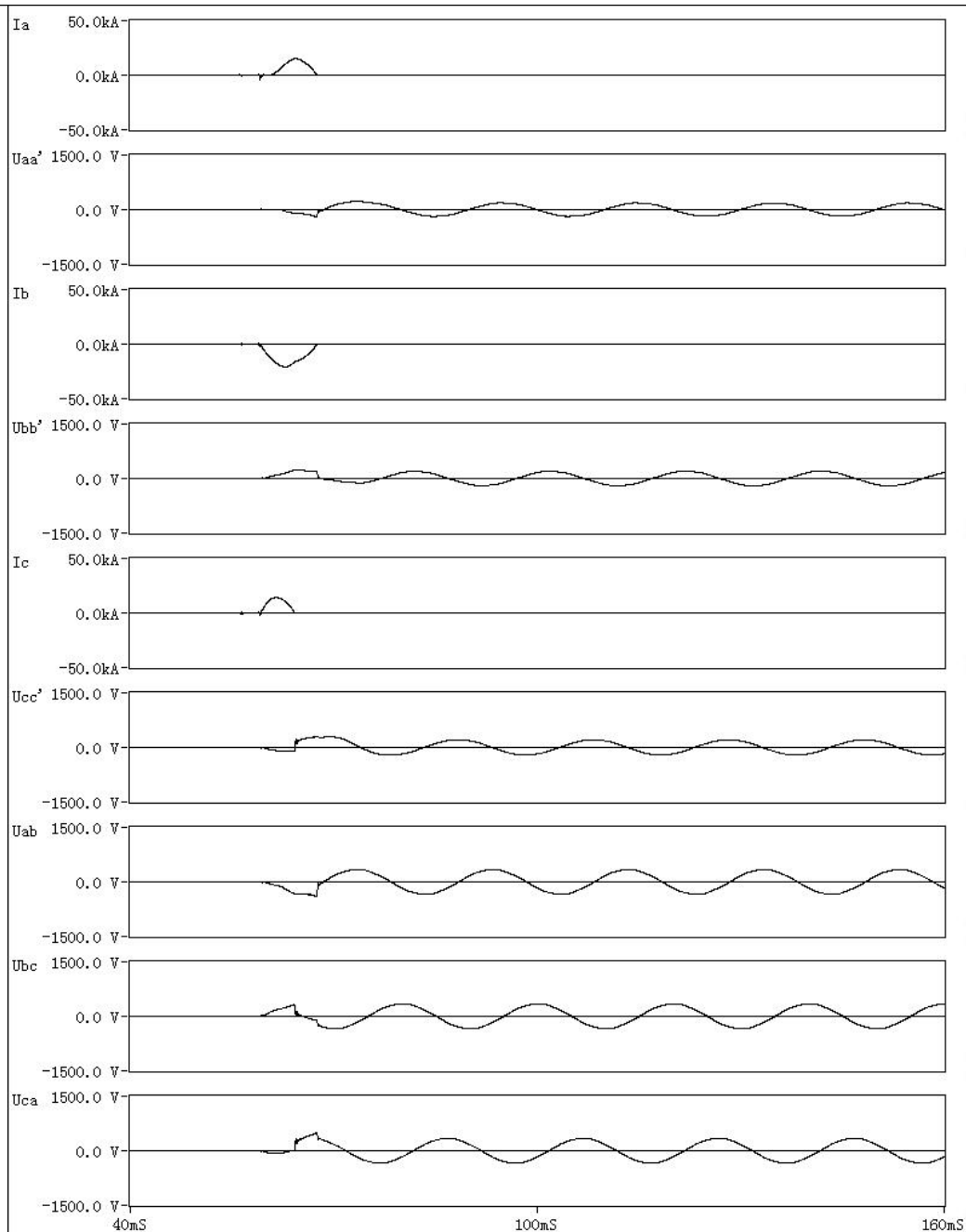
 T_{arc} A=8.394mS
 T_{arc} B=7.634mS
 T_{arc} C=5.760mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#16-01



Product: MCCB
 Type: 3P/125A
 No.: #16
 Sequence: O
 I/I_p :
 25.69/53.44kA
 $\cos \phi$: 0.232

U_t : 246.2V

$I_p A$ =15.790kA
 $I_p B$ =20.935kA
 $I_p C$ =14.124kA

$I^2t A$ =697.1kAAS
 $I^2t B$ =1.726MAAS
 $I^2t C$ =527.6kAAS

$T_{mb A}$ =6.760mS
 $T_{mb B}$ =8.620mS
 $T_{mb C}$ =5.060mS

$T_{arc A}$ =5.115mS
 $T_{arc B}$ =7.140mS
 $T_{arc C}$ =4.133mS

I : prospective current 预期电流有效值 $\cos \phi$: prospective power factor 预期功率因数

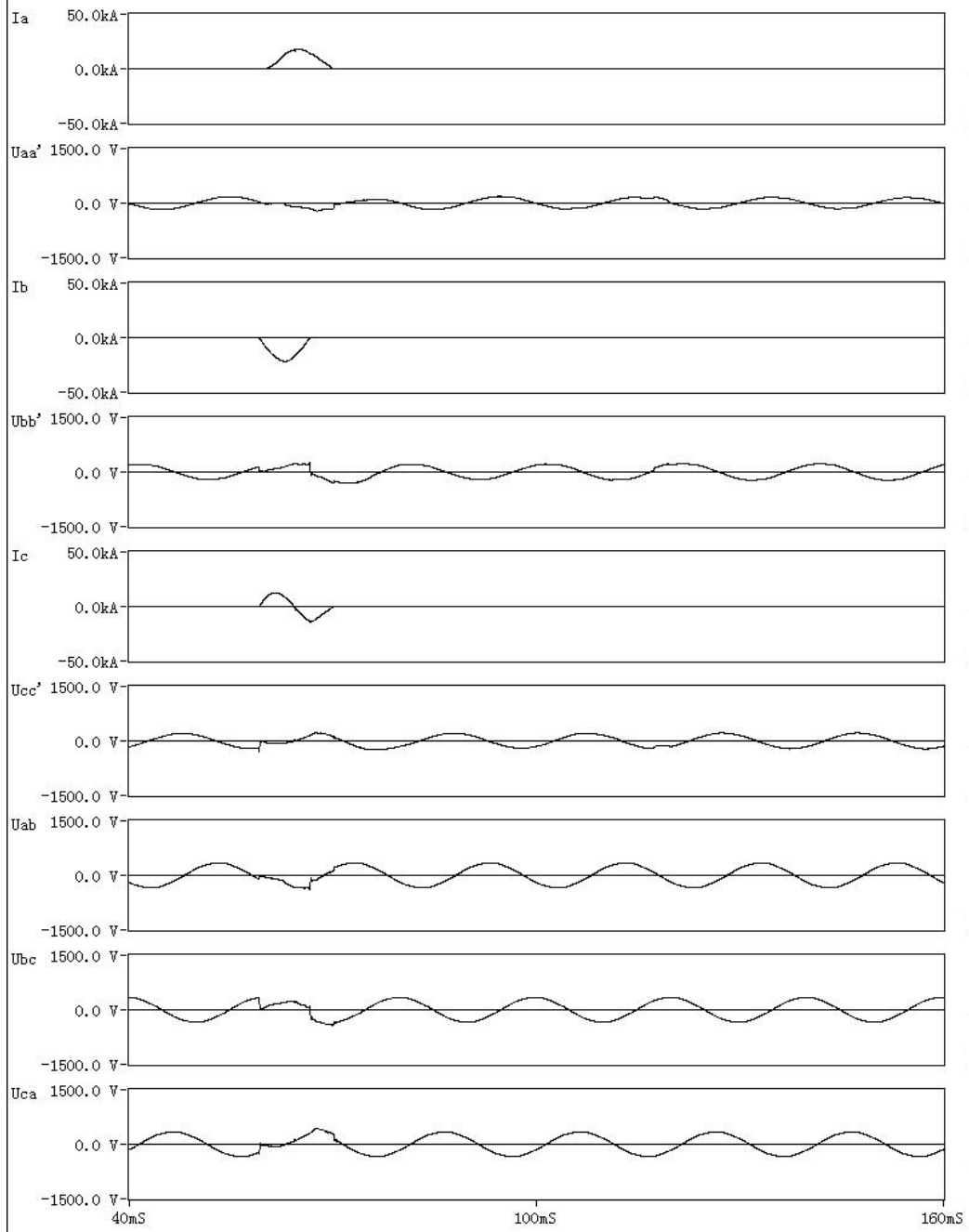
U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量

T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

IEC 60947-2

额定极限短路分断能力

Oscillogram: SFA231303-#16-02



Product: MCCB
 Type: 3P/125A
 No.: #16
 Sequence: CO
 I/I_p:
 25.69/53.44kA
 cos φ : 0.232

 U_t: 246.2V

 I_p A=17.758kA
 I_p B=21.904kA
 I_p C=14.003kA

 I²t A=1.358MAAS
 I²t B=1.727MAAS
 I²t C=850.7kAAS

 T_{mb} A=10.06mS
 T_{mb} B=7.560mS
 T_{mb} C=10.90mS

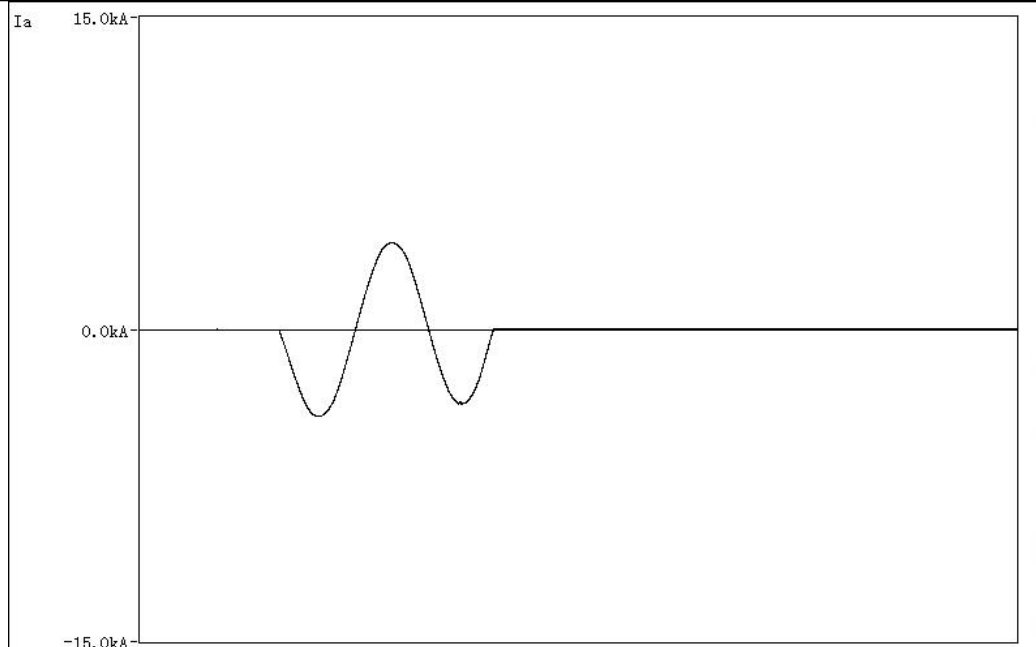
 T_{arc} A=7.042mS
 T_{arc} B=6.727mS
 T_{arc} C=10.08mS

I: prospective current 预期电流有效值 cos φ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

单极短路

Oscillogram: SFA231303-#17-01



Product: MCCB
 Type: 3P/250A
 No.: #17/A
 Sequence: O
 I/I_p :
 3.125/4.494kA
 $\cos \phi$: 0.888

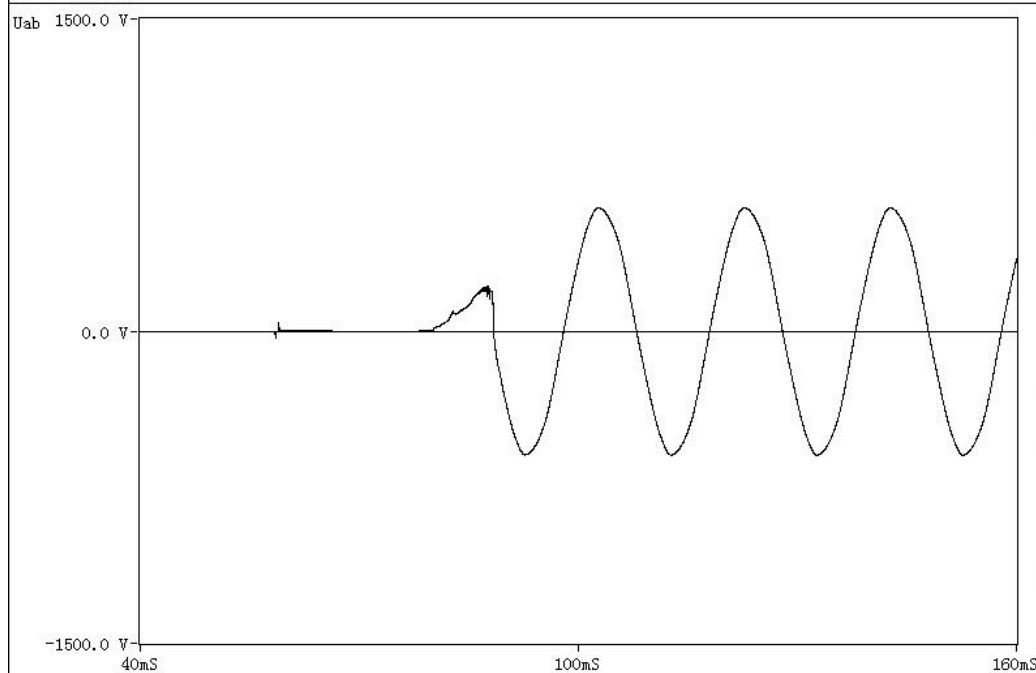
U_t : 428.2V

I_p A=4.180kA

I^2t A=235.3kAAS

T_{mb} A=29.42mS

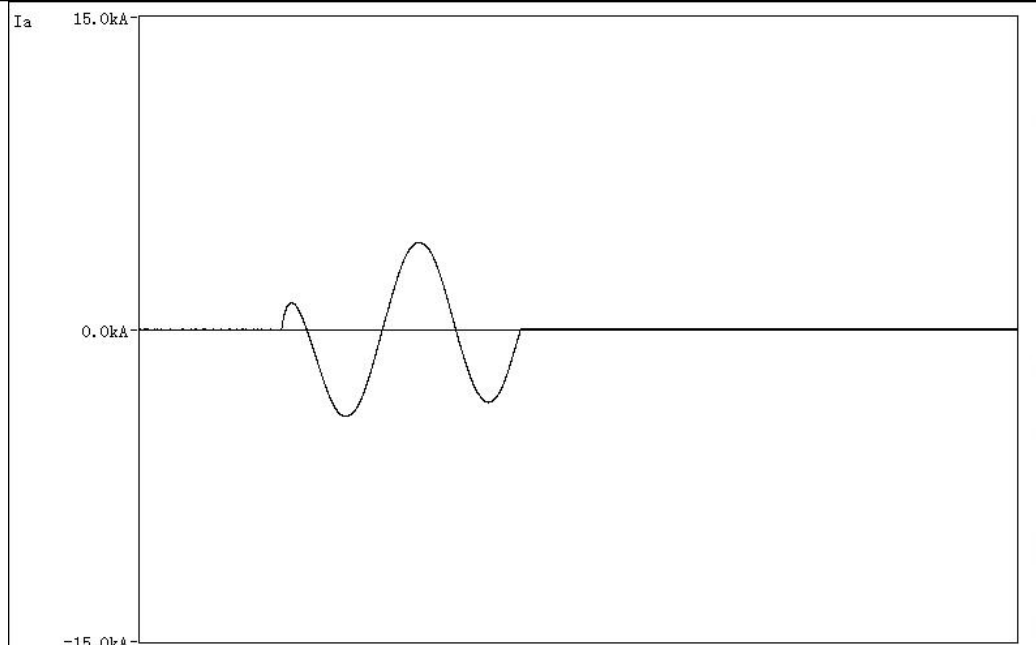
T_{arc} A=7.407mS

 U_t : 试验电压test voltage I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

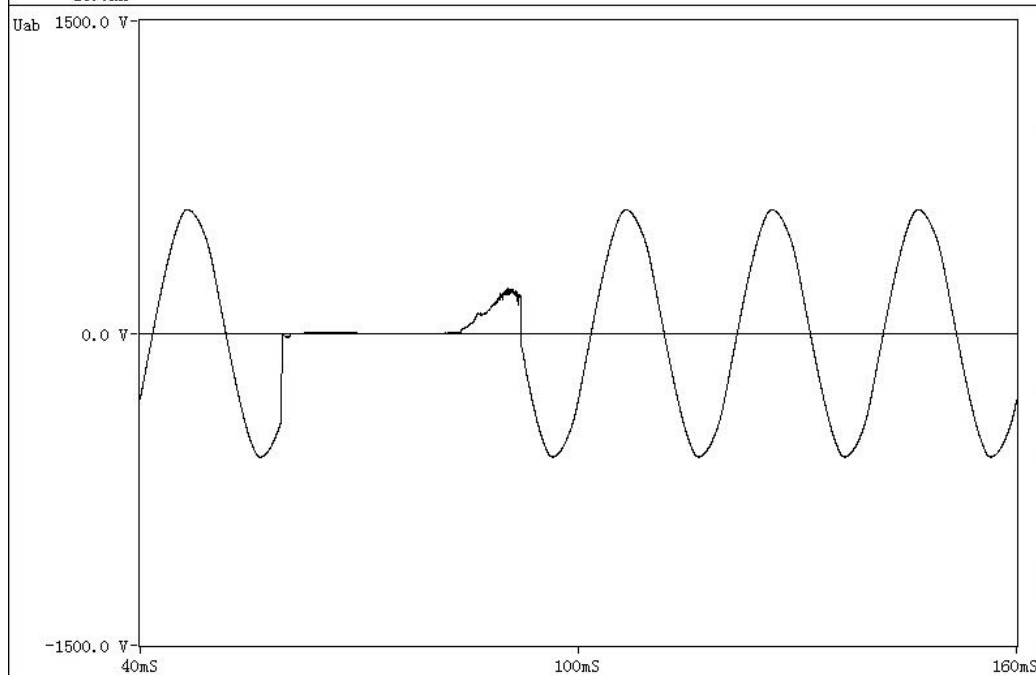
IEC 60947-2

单极短路

Oscillogram: SFA231303-#17-02



Product: MCCB
 Type: 3P/250A
 No.: #17/A
 Sequence: CO
 I/I_p:
 3.125/4.494kA
 cos φ : 0.888

U_t: 428.2VI_p A=4.173kAI²t A=234.7kAAST_{mb} A=32.76mST_{arc} A=7.796mSU_t: 试验电压test voltage

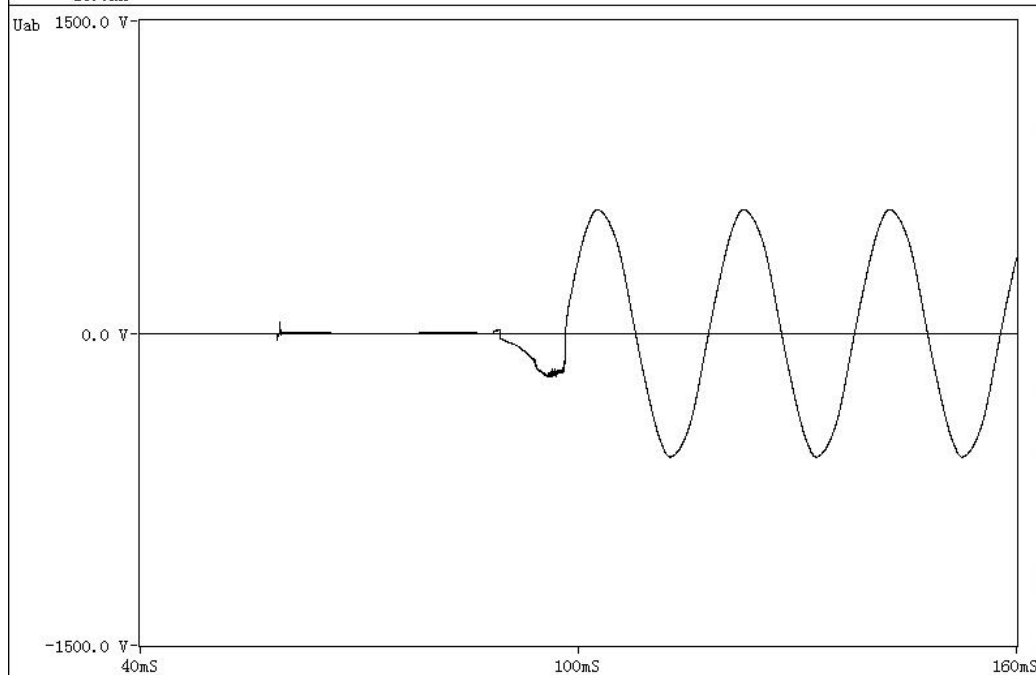
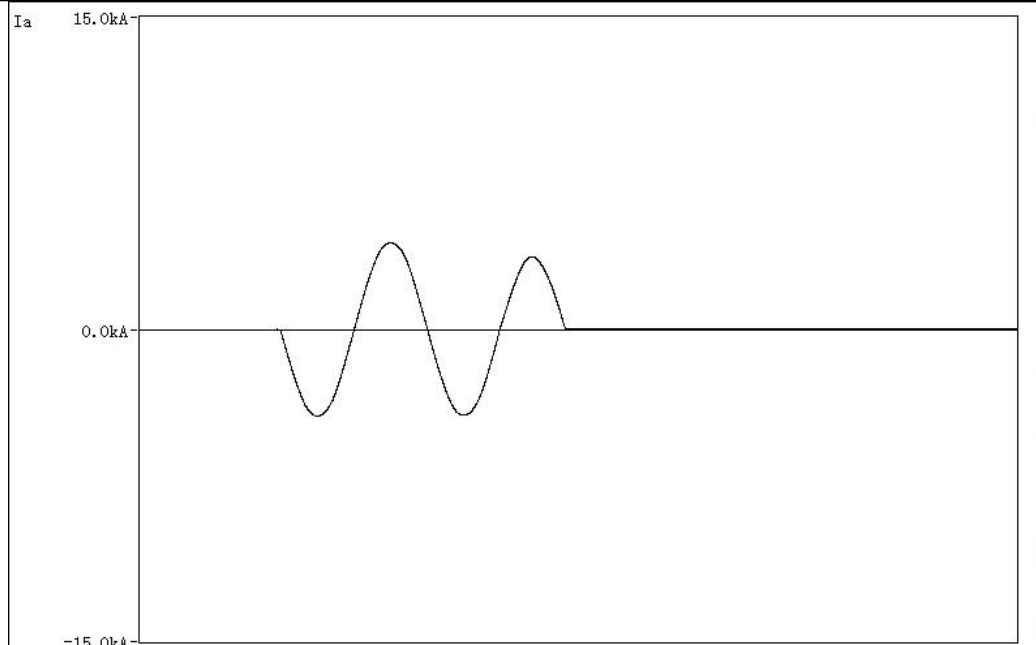
I: 预期波电流有效值prospective current current cos φ : 预期波功率因数prospective power factor

I_p: 峰值电流peak current I²t: 焦耳积分joule integral T_{mb}: 通断时间make-break time T_{arc}: 燃弧时间arcing time

IEC 60947-2

单极短路

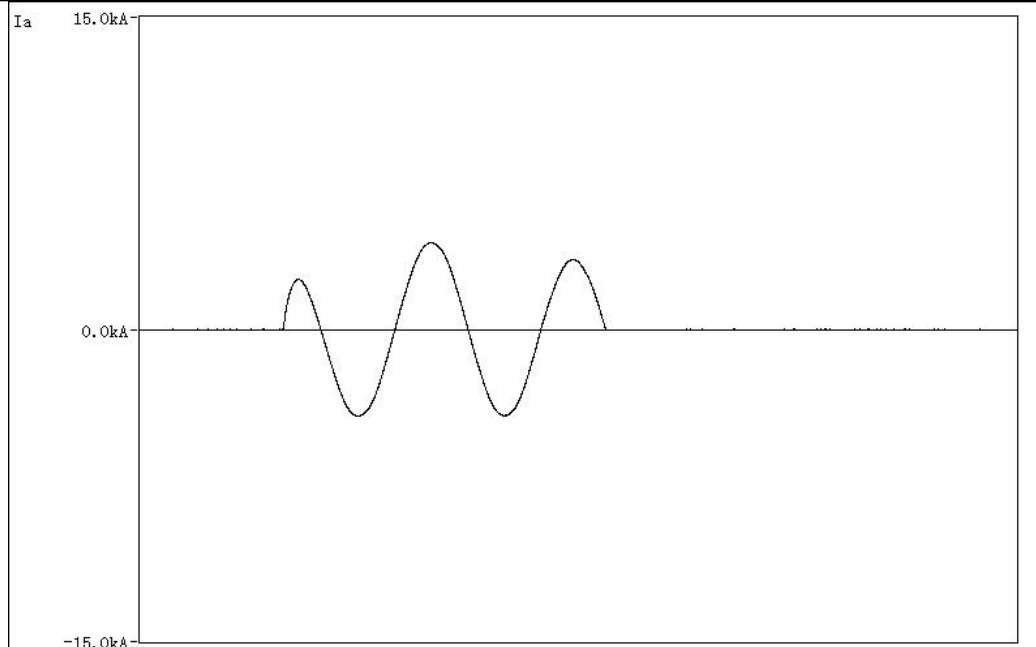
Oscillogram: SFA231303-#17-03

 U_t : 试验电压test voltage I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

IEC 60947-2

单极短路

Oscillogram: SFA231303-#17-04



Product: MCCB
 Type: 3P/250A
 No.: #17/B
 Sequence: CO
 I/I_p :
 3.125/4.494kA
 $\cos \phi$: 0.888

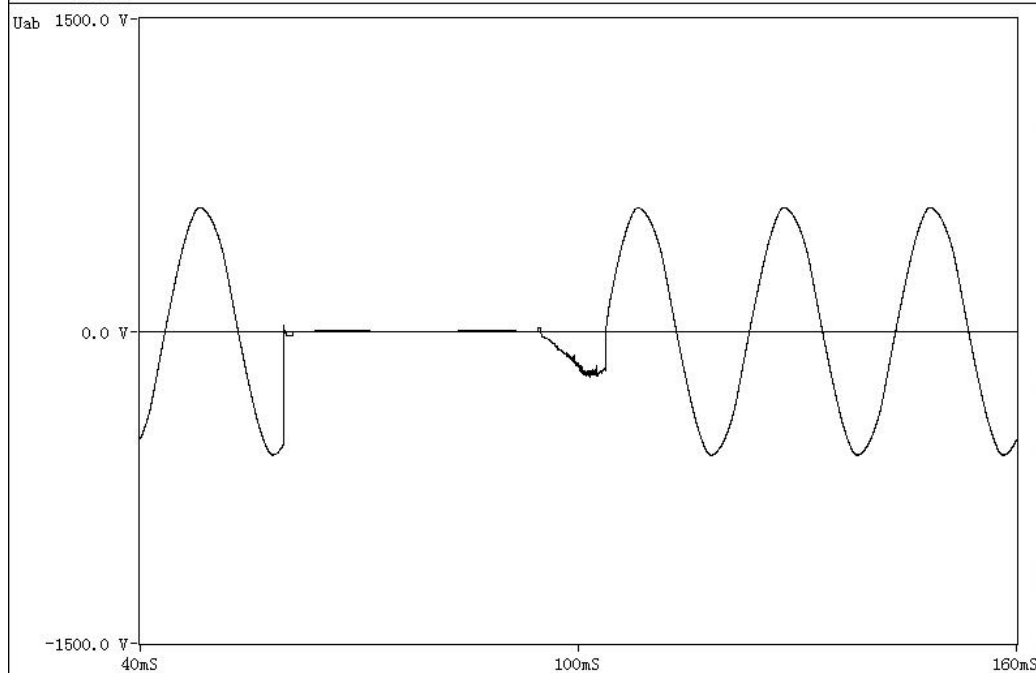
U_t : 428.2V

I_p A=4.164kA

I^2t A=326.5kAAS

T_{mb} A=44.14mS

T_{arc} A=8.803mS



U_t : 试验电压test voltage

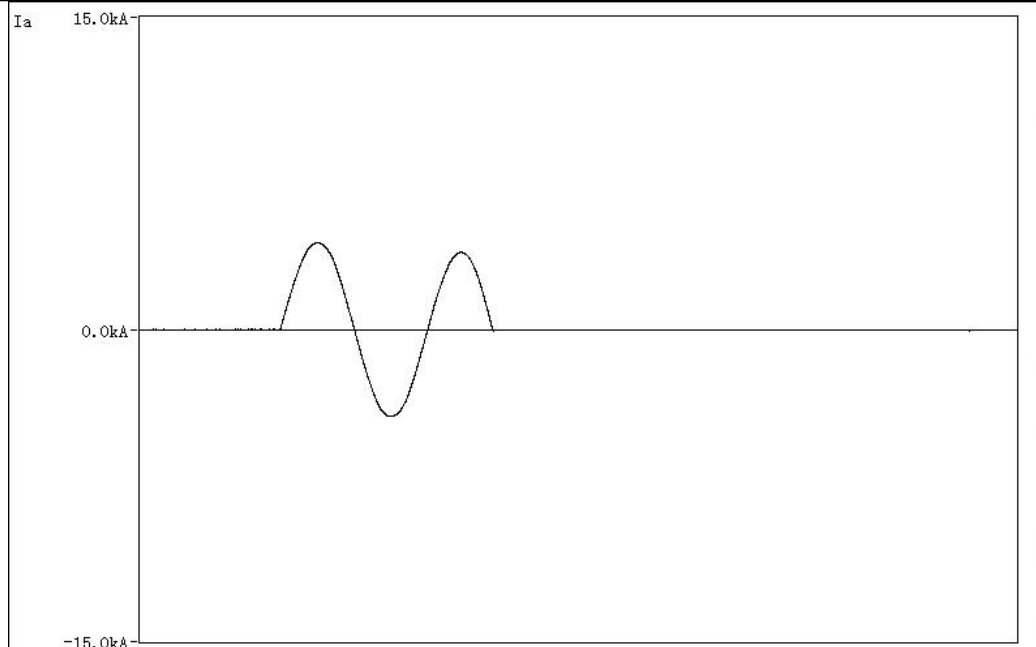
I : 预期波电流有效值prospective current current $\cos \phi$: 预期波功率因数prospective power factor

I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

IEC 60947-2

单极短路

Oscillogram: SFA231303-#17-05



Product: MCCB
 Type: 3P/250A
 No.: #17/C
 Sequence: O
 I/I_p :
 3.125/4.494kA
 $\cos \phi$: 0.888

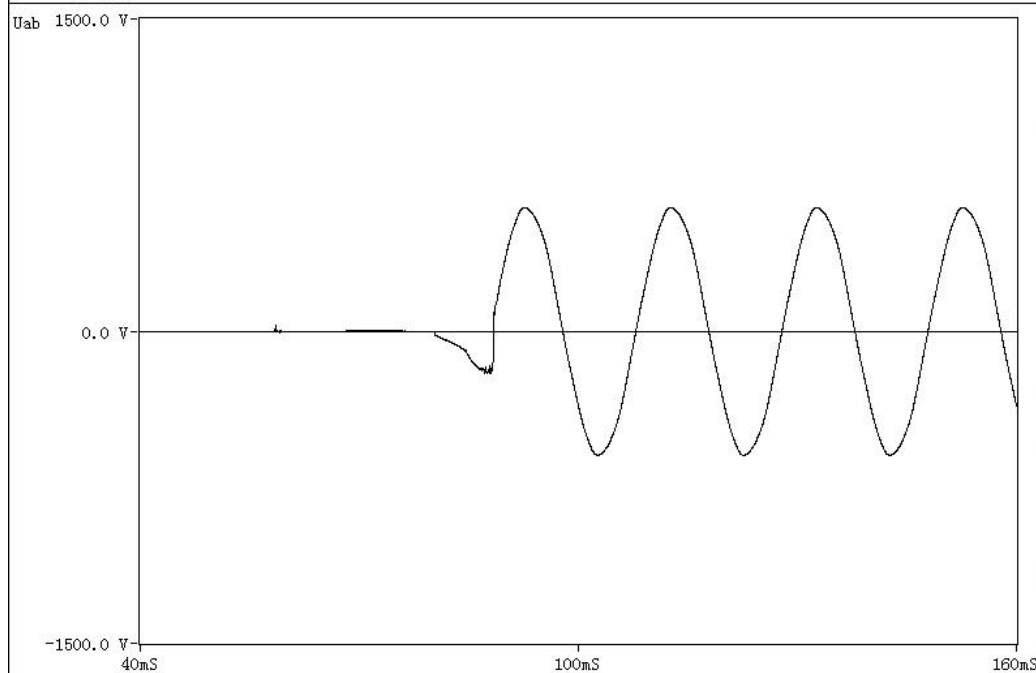
U_t : 428.2V

I_p A=4.195kA

I^2t A=238.5kAAS

T_{mb} A=29.12mS

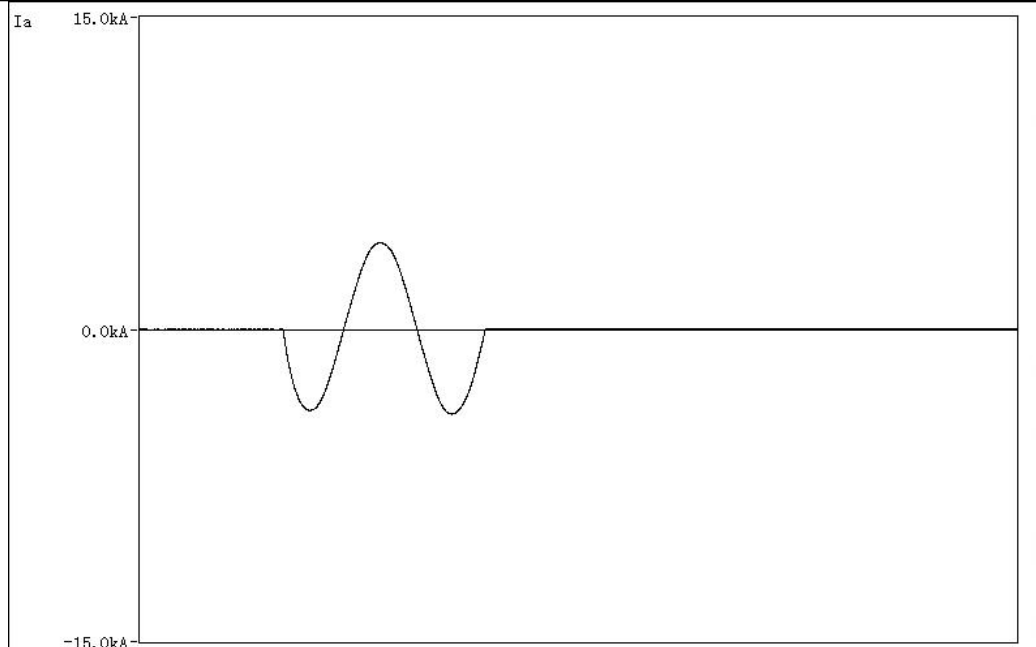
T_{arc} A=7.667mS

 U_t : 试验电压test voltage I : 预期波电流有效值prospective current $\cos \phi$: 预期波功率因数prospective power factor I_p : 峰值电流peak current I^2t : 焦耳积分joule integral T_{mb} : 通断时间make-break time T_{arc} : 燃弧时间arcing time

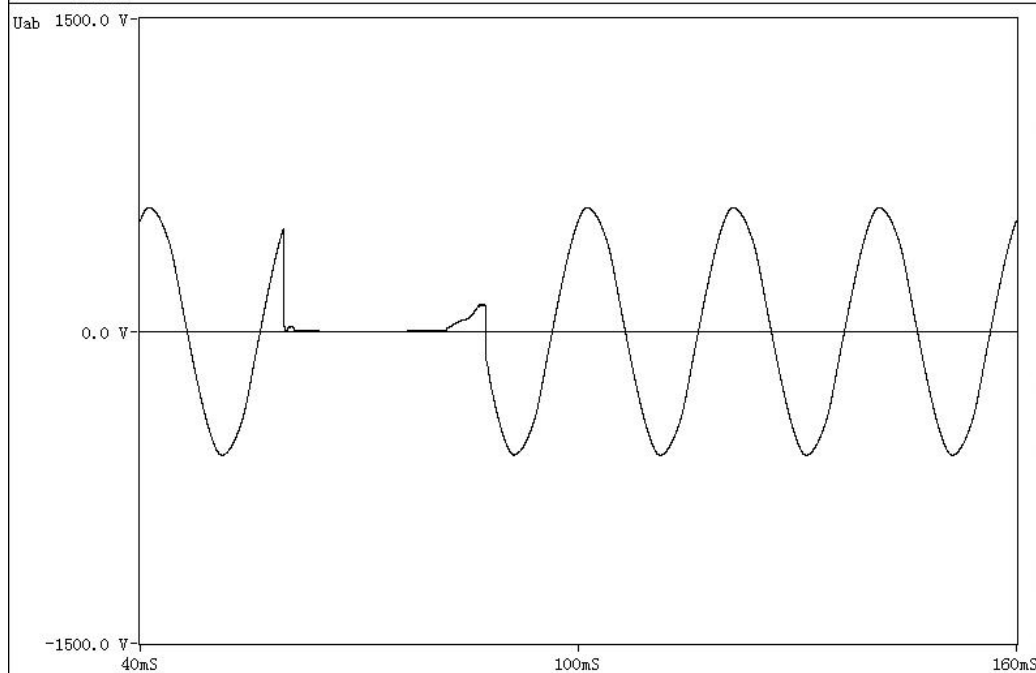
IEC 60947-2

单极短路

Oscillogram: SFA231303-#17-06



Product: MCCB
 Type: 3P/250A
 No.: #17/C
 Sequence: CO
 I/I_p:
 3.125/4.494kA
 cos φ : 0.888

U_t: 428.2VI_p A=4.169kAI²t A=232.9kAAST_{mb} A=27.72mST_{arc} A=4.768mSU_t: 试验电压test voltage

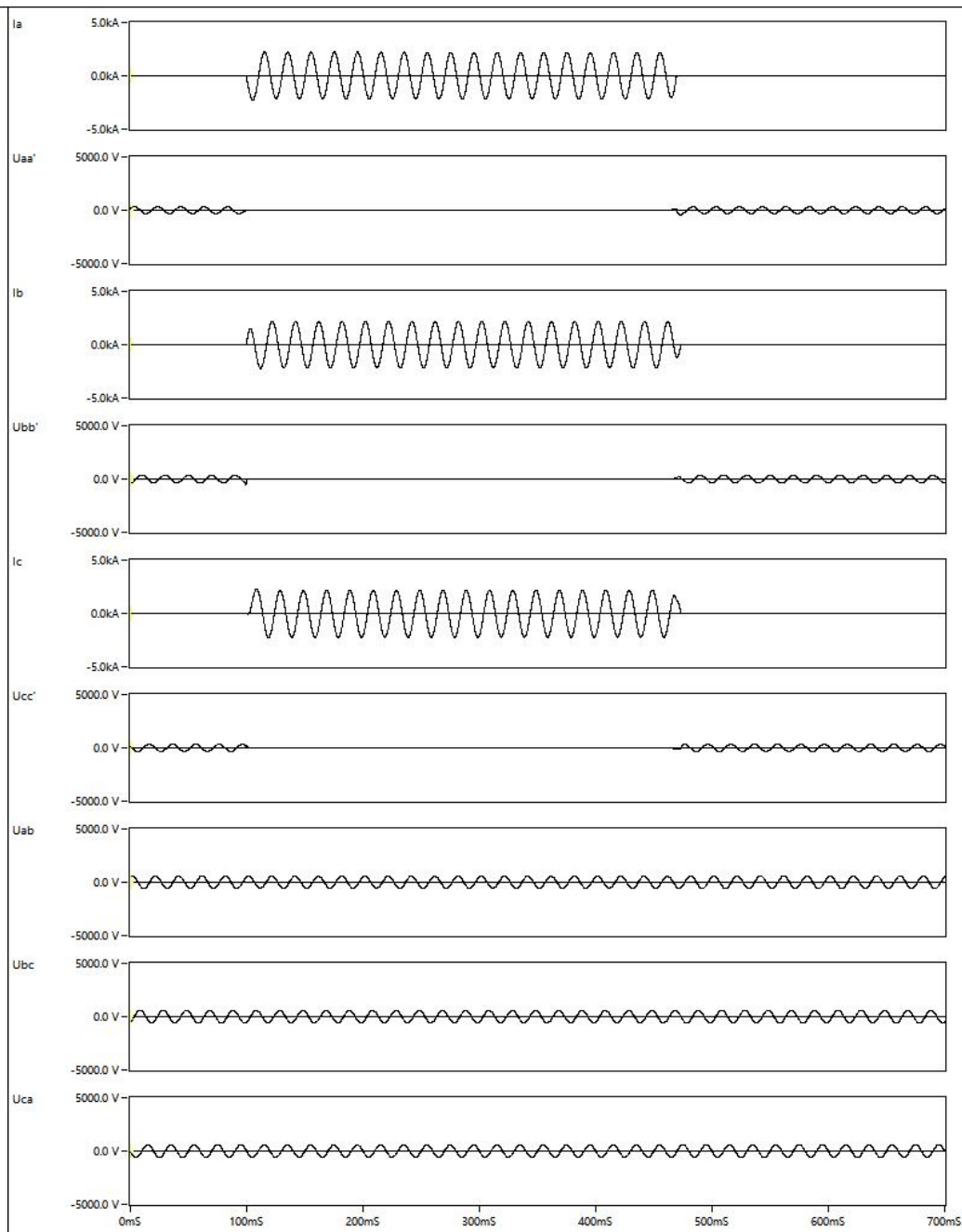
I: 预期波电流有效值prospective current current cos φ : 预期波功率因数prospective power factor

I_p: 峰值电流peak current I²t: 焦耳积分joule integral T_{mb}: 通断时间make-break time T_{arc}: 燃弧时间arcing time

IEC 60947-2

过载性能

Oscillogram: SFA231310-#10-01



Product: MCCB
 Type: 4P/250A
 No.: #1
 Sequence: MB1
 I: 1508.1A
 $\cos \phi$: 0.51

U_t : 428.3V

I_p A=2.265kA
 I_p B=2.217kA
 I_p C=2.280kA

I^2t A=885.1kAAS
 I^2t B=873.2kAAS
 I^2t C=896.3kAAS

T_{mb} A=372.9mS
 T_{mb} B=376.4mS
 T_{mb} C=375.9mS

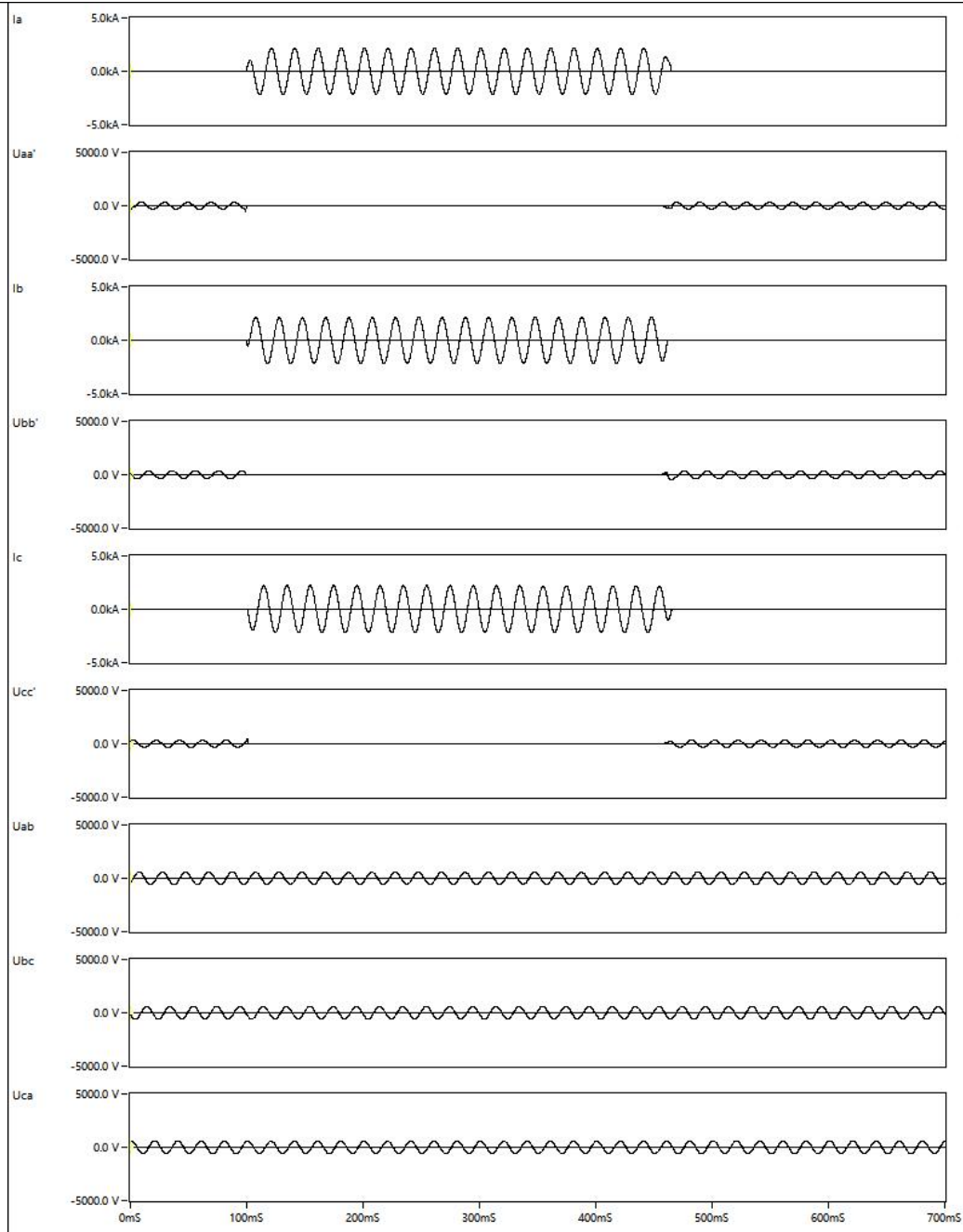
T_{arc} A=8.721mS
 T_{arc} B=12.17mS
 T_{arc} C=11.87mS

I: prospective current 预期电流有效值 $\cos \phi$: prospective power factor 预期功率因数
 U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量
 T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

IEC 60947-2

过载性能

Oscillogram: SFA231310-#10-02



Product: MCCB
 Type: 4P/250A
 No.: #1
 Sequence: MB5
 I: 1508.1A
 cos ϕ : 0.51

 U_t : 428.3V

 I_p A=2.207kA
 I_p B=2.210kA
 I_p C=2.238kA

 I^2t A=835.6kAAS
 I^2t B=837.7kAAS
 I^2t C=875.0kAAS

 T_{mb} A=368.0mS
 T_{mb} B=365.5mS
 T_{mb} C=367.9mS

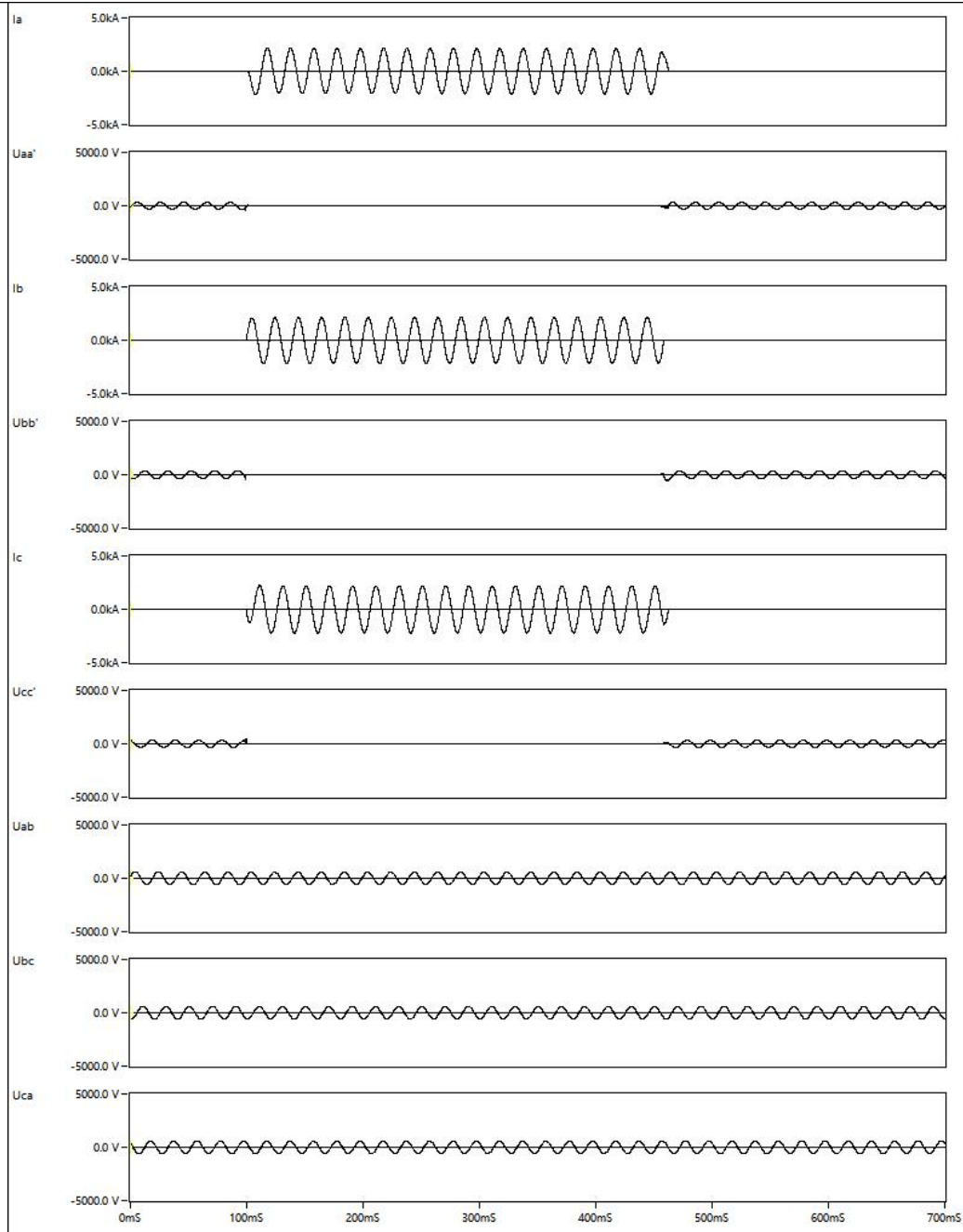
 T_{arc} A=11.73mS
 T_{arc} B=9.229mS
 T_{arc} C=11.68mS

I: prospective current 预期电流有效值 cos ϕ : prospective power factor 预期功率因数
 U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量
 T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

IEC 60947-2

过载性能

Oscillogram: SFA231310-#10-03



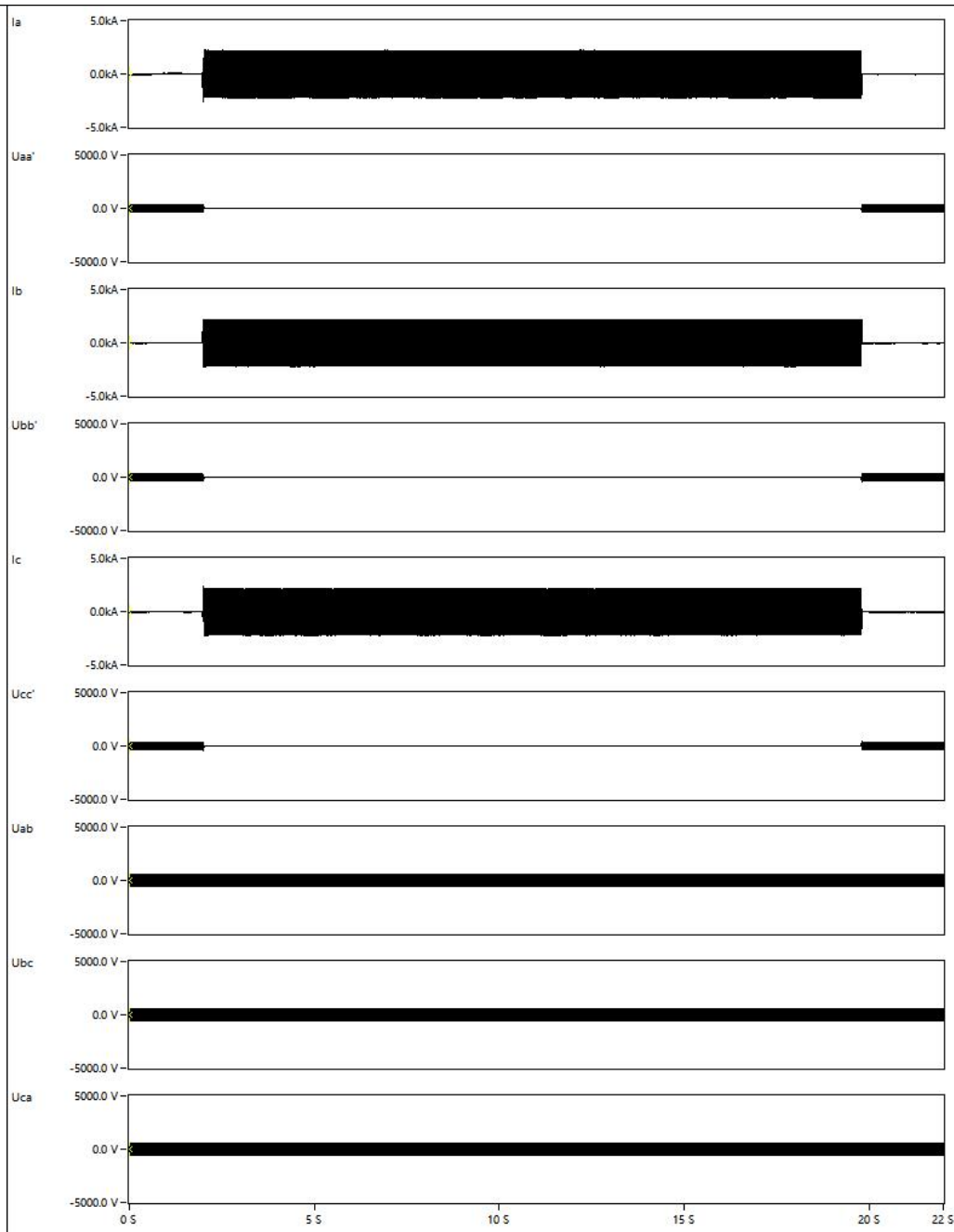
Product: MCCB
 Type: 4P/250A
 No.: #1
 Sequence: MB9
 I: 1508.1A
 cos φ: 0.51
 U_t: 428.3V
 I_p A=2.190kA
 I_p B=2.204kA
 I_p C=2.236kA
 I²t A=807.5kAAS
 I²t B=838.2kAAS
 I²t C=867.2kAAS
 T_{mb} A=364.3mS
 T_{mb} B=362.7mS
 T_{mb} C=365.6mS
 T_{arc} A=9.073mS
 T_{arc} B=6.424mS
 T_{arc} C=9.429mS

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

过载性能

Oscillogram: SFA231310-#10-04



Product: MCCB
 Type: 4P/250A
 No.: #1
 Sequence: M1
 I: 1508.1A
 cos φ: 0.51

 U_t: 428.3V

 I_p A=2.604kA
 I_p B=2.238kA
 I_p C=2.333kA

 I²t A=43.52MAAS
 I²t B=42.39MAAS
 I²t C=42.54MAAS

 T_{mb} A=17.801 S
 T_{mb} B=17.800 S
 T_{mb} C=17.797 S

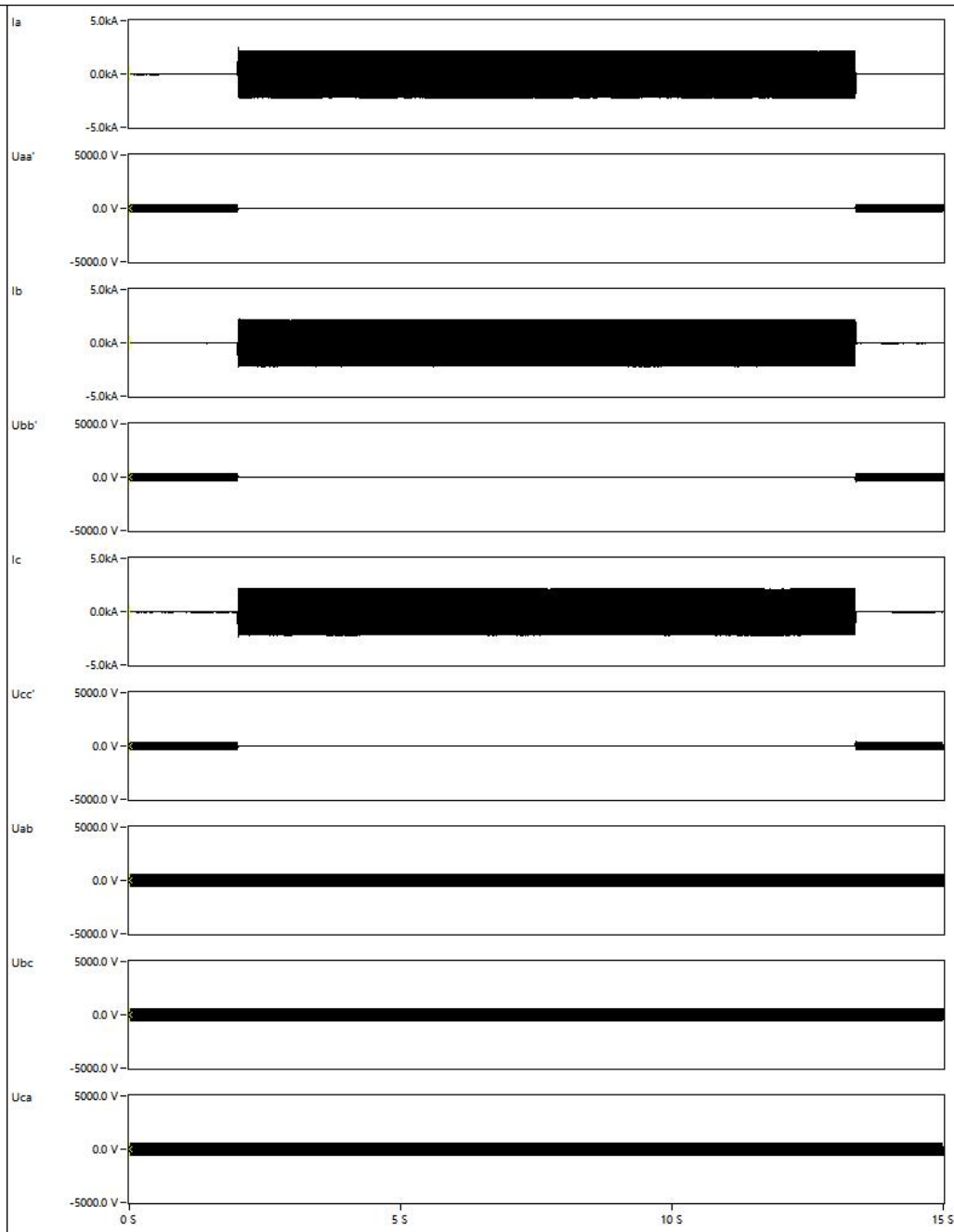
 T_{arc} A=0.007 S
 T_{arc} B=0.006 S
 T_{arc} C=0.003 S

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

过载性能

Oscillogram: SFA231310-#10-05



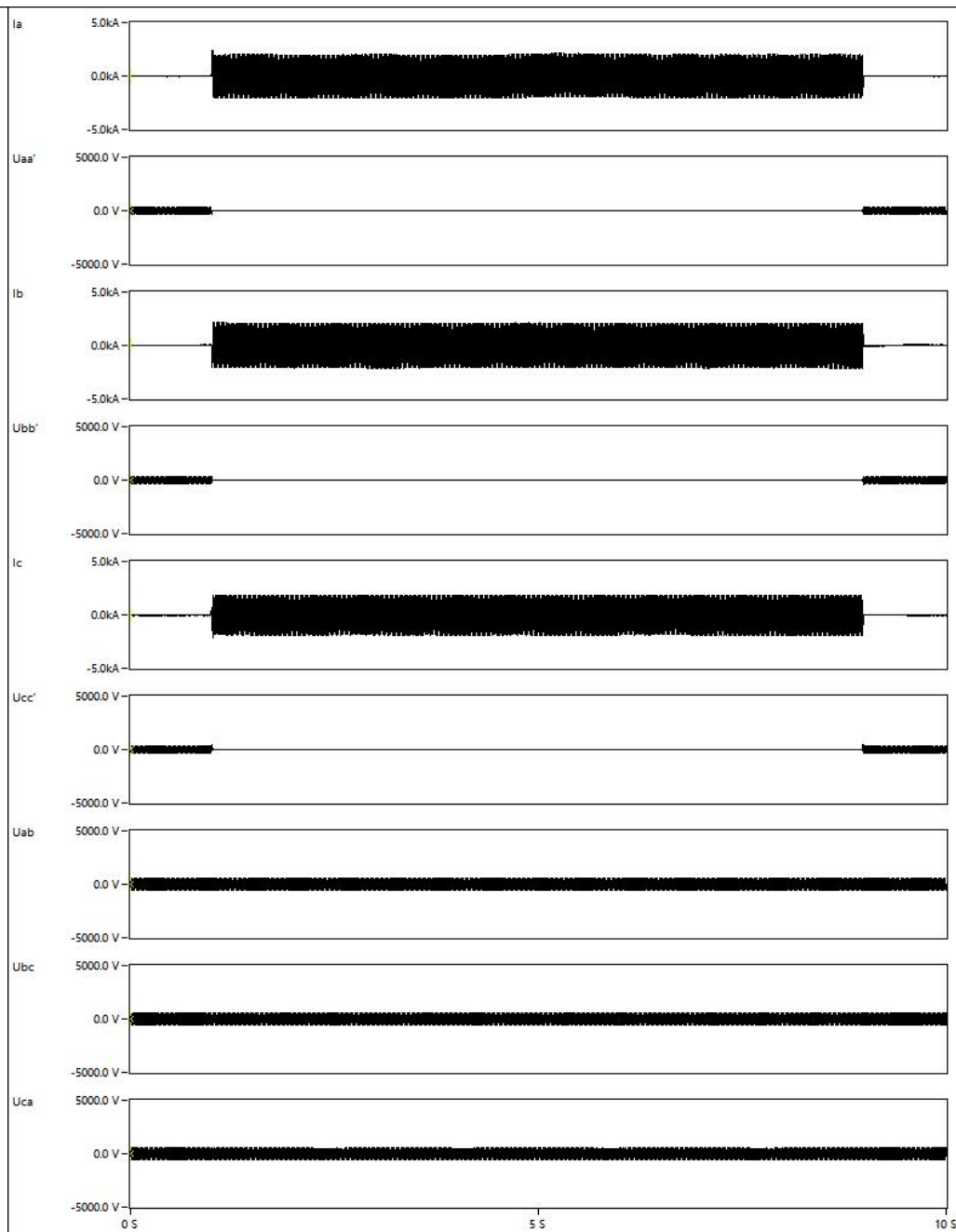
Product: MCCB
 Type: 4P/250A
 No.: #1
 Sequence: M2
 I: 1508.1A
 cos φ: 0.51
 U_t: 428.3V
 I_p A=2.538kA
 I_p B=2.274kA
 I_p C=2.343kA
 I²t A=27.87MAAS
 I²t B=27.03MAAS
 I²t C=27.21MAAS
 T_{mb} A=11.390 S
 T_{mb} B=11.390 S
 T_{mb} C=11.387 S
 T_{arc} A=0.004 S
 T_{arc} B=0.005 S
 T_{arc} C=0.001 S

I: prospective current 预期电流有效值 cos φ: prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

过载性能

Oscillogram: SFA231310-#10-06



Product: MCCB
 Type: 4P/250A
 No.: #1
 Sequence: M3
 I: 1508.1A
 $\cos \phi$: 0.51

U_t : 428.3V

I_p A=2.392kA
 I_p B=2.137kA
 I_p C=2.105kA

I^2t A=16.42MAAS
 I^2t B=17.42MAAS
 I^2t C=13.82MAAS

T_{mb} A=7.985 S
 T_{mb} B=7.986 S
 T_{mb} C=7.984 S

T_{arc} A=0.004 S
 T_{arc} B=0.004 S
 T_{arc} C=0.001 S

I: prospective current 预期电流有效值 $\cos \phi$: prospective power factor 预期功率因数

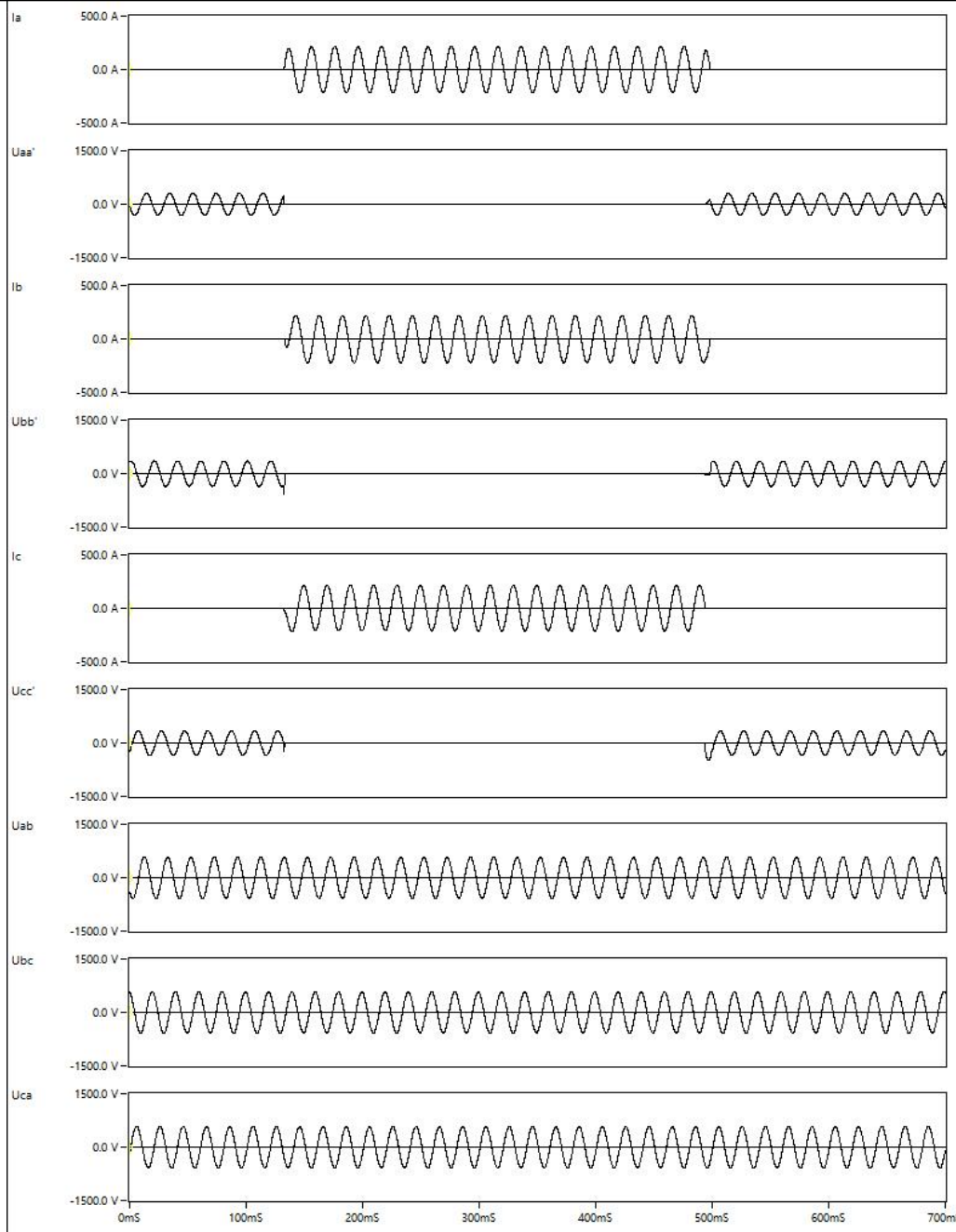
U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量

T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

IEC 60947-2

带电操作性能

Oscillogram: SSA231303-#1-01



Product: MCB
 Type: 3P/150A
 No.: #1
 Sequence: EN1
 I: 151.2A
 cos ϕ : 0.81

 U_t: 402.9V

 I_p A=218.232 A
 I_p B=224.588 A
 I_p C=217.793 A

 I²t A=8.469kAAS
 I²t B=8.960kAAS
 I²t C=8.286kAAS

 T_{mb} A=368.3mS
 T_{mb} B=368.8mS
 T_{mb} C=364.3mS

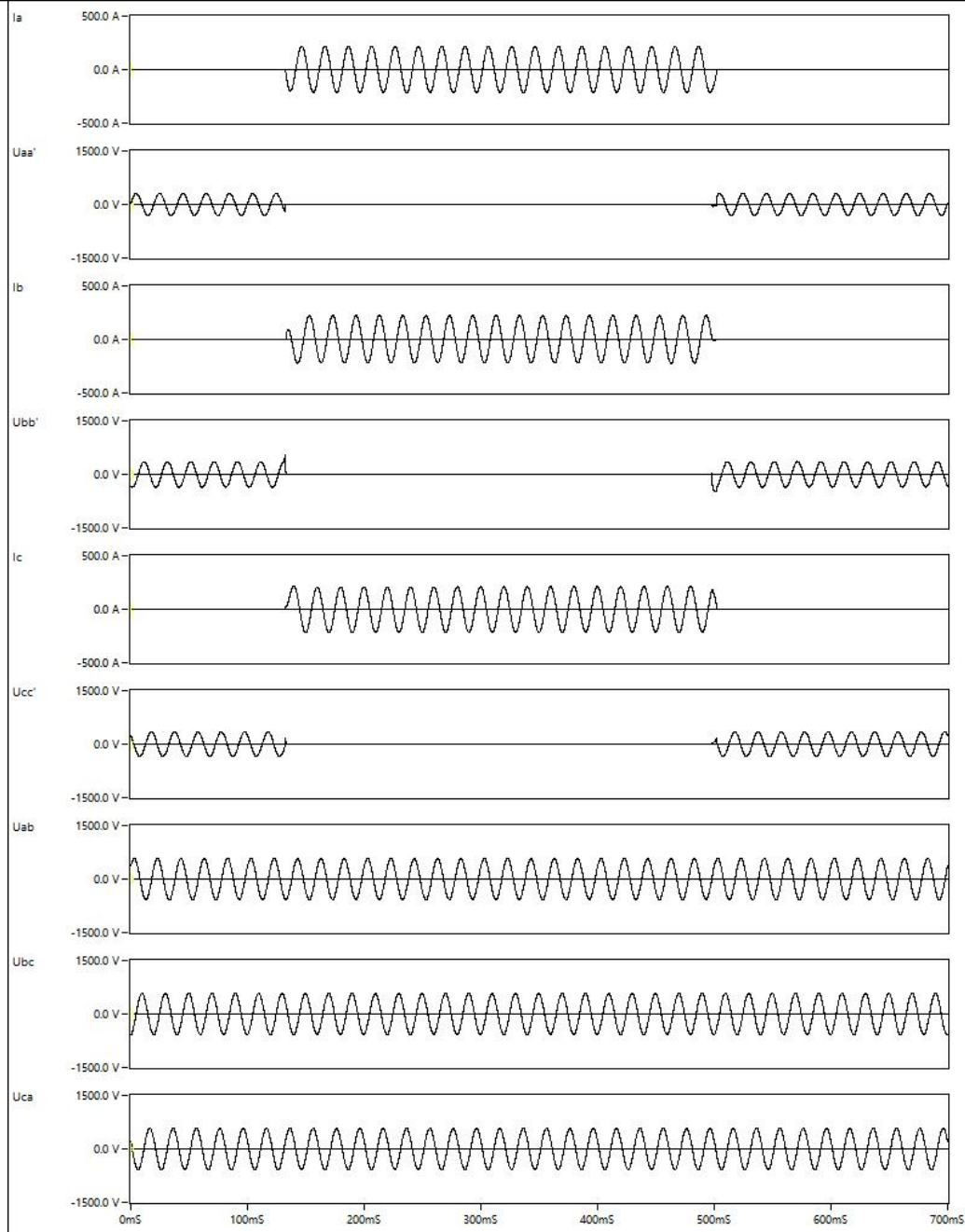
 T_{arc} A=4.901mS
 T_{arc} B=5.823mS
 T_{arc} C=2.834mS

I: prospective current 预期电流有效值 cos ϕ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

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带电操作性能

Oscillogram: SSA231303-#1-02



Product: MCB
 Type: 3P/150A
 No.: #1
 Sequence:
 EN500
 I: 151.2A
 $\cos \phi$: 0.81

U_t : 402.9V

I_p A=218.250 A
 I_p B=223.930 A
 I_p C=218.707 A

I^2t A=8.625kAAS
 I^2t B=8.961kAAS
 I^2t C=8.405kAAS

T_{mb} A=372.3mS
 T_{mb} B=370.7mS
 T_{mb} C=372.4mS

T_{arc} A=6.363mS
 T_{arc} B=5.292mS
 T_{arc} C=6.497mS

I: prospective current 预期电流有效值 $\cos \phi$: prospective power factor 预期功率因数

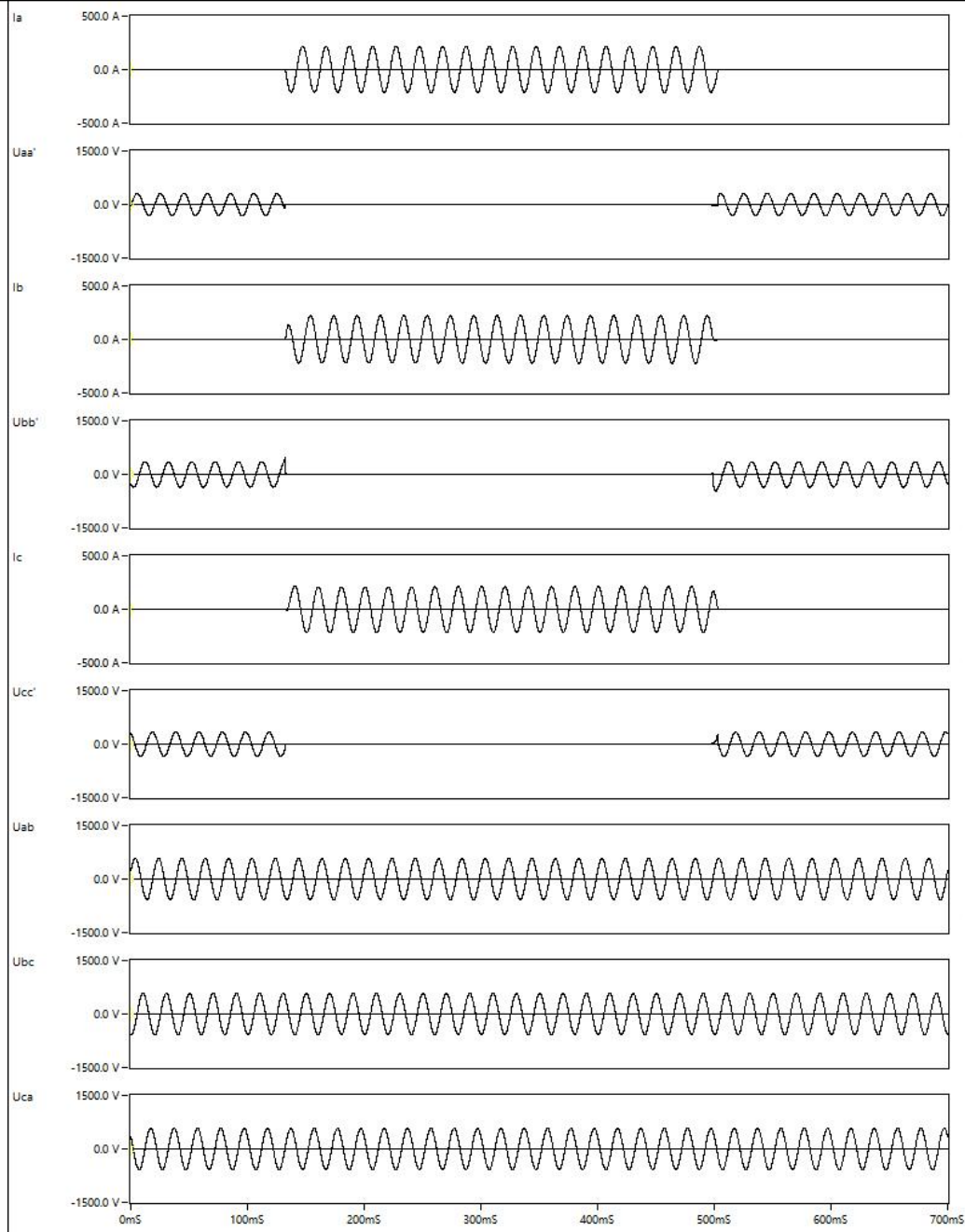
U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量

T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

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带电操作性能

Oscillogram: SSA231303-#1-03



Product: MCB
 Type: 3P/150A
 No.: #1
 Sequence:
 EN1000
 I: 151.2A
 $\cos \phi$: 0.81

U_t : 402.9V

I_p A=218.743 A
 I_p B=222.871 A
 I_p C=217.994 A

I^2t A=8.646kAAS
 I^2t B=9.000kAAS
 I^2t C=8.383kAAS

T_{mb} A=373.1mS
 T_{mb} B=371.3mS
 T_{mb} C=373.2mS

T_{arc} A=4.692mS
 T_{arc} B=3.294mS
 T_{arc} C=4.761mS

I: prospective current 预期电流有效值 $\cos \phi$: prospective power factor 预期功率因数

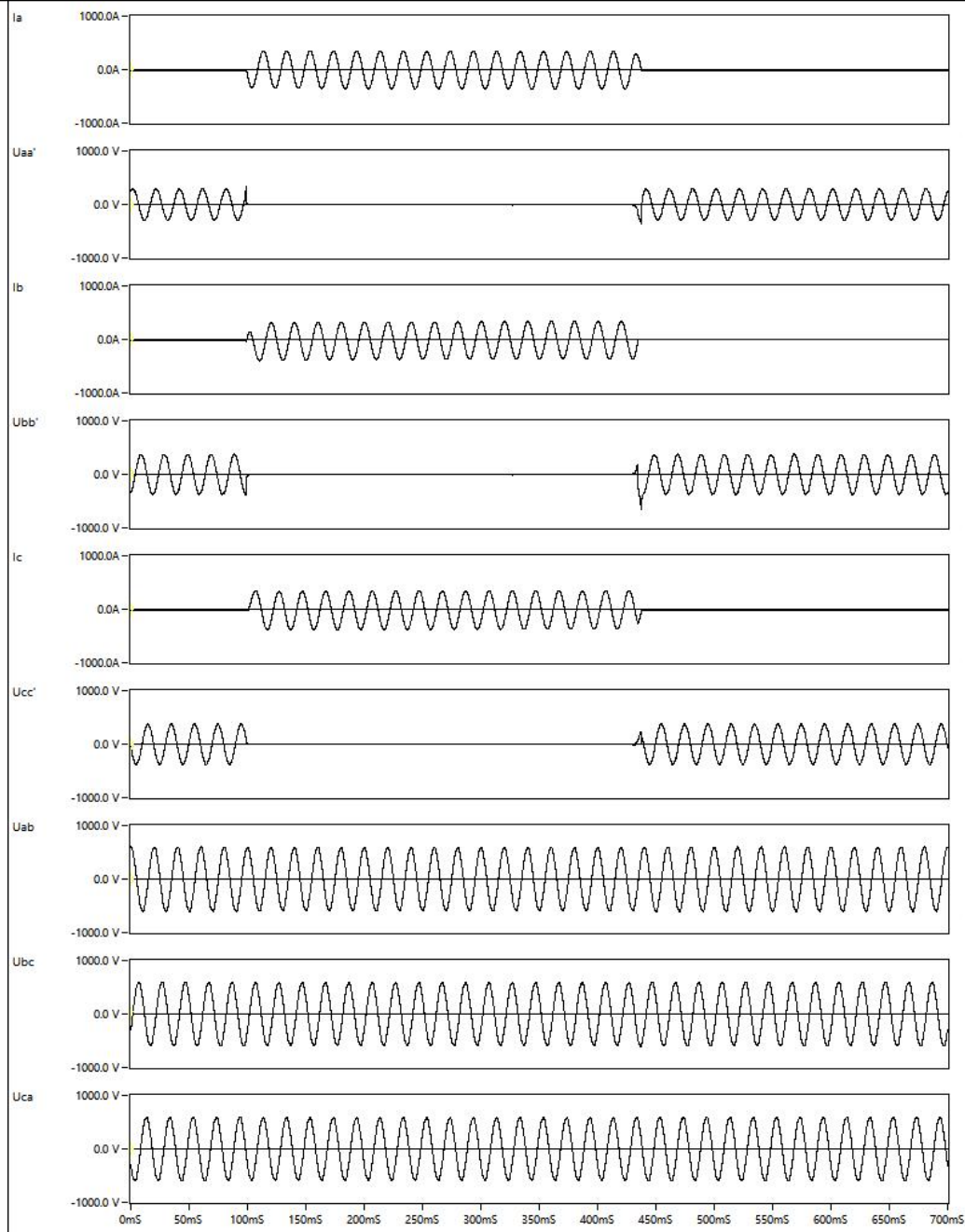
U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量

T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

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带电操作性能

Oscillogram: SSA231303-#10-01



Product: MCCB
 Type: 3P/250A
 No.: #10
 Sequence: EN1
 I: 251.7A
 $\cos \phi$: 0.81

U_t : 402.7V

$I_p A=361.852A$
 $I_p B=400.828A$
 $I_p C=385.564A$

$I^2t A=20.80kAAS$
 $I^2t B=20.97kAAS$
 $I^2t C=21.76kAAS$

$T_{mb A}=339.5mS$
 $T_{mb B}=336.8mS$
 $T_{mb C}=339.7mS$

$T_{arc A}=6.252mS$
 $T_{arc B}=3.754mS$
 $T_{arc C}=6.306mS$

I: prospective current 预期电流有效值 $\cos \phi$: prospective power factor 预期功率因数

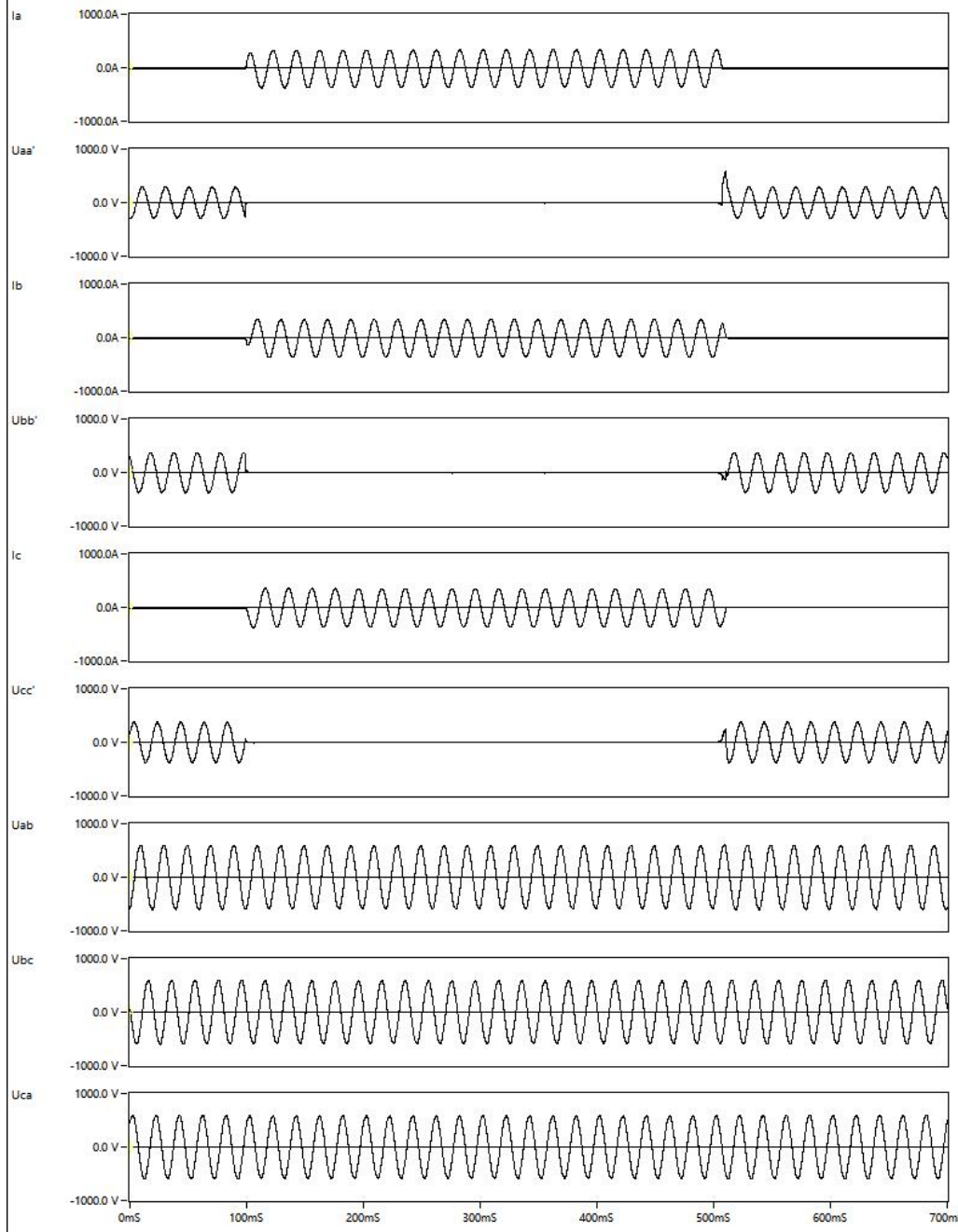
U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量

T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

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带电操作性能

Oscillogram: SSA231303-#10-02



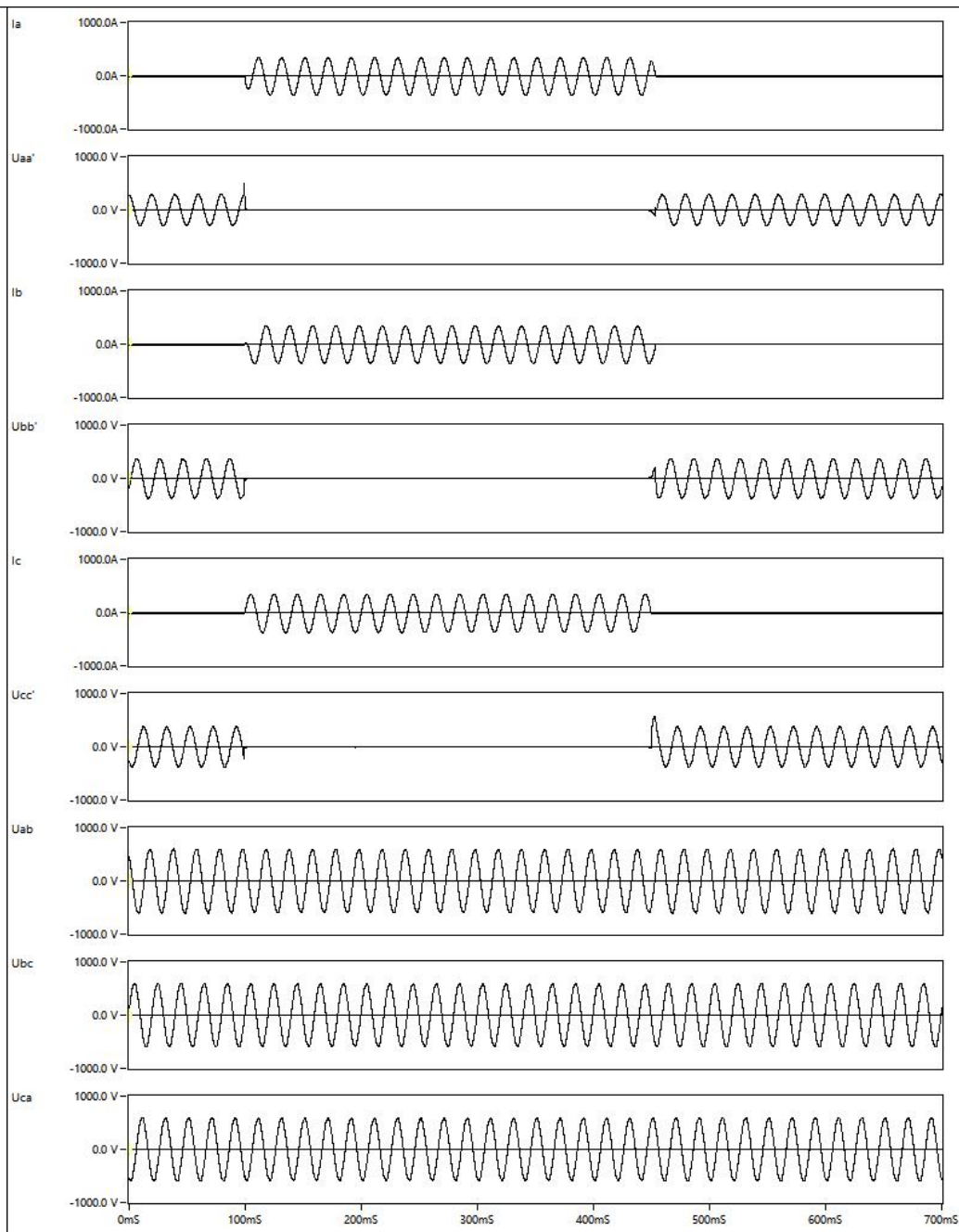
Product: MCCB
 Type: 3P/250A
 No.: #10
 Sequence: EN500
 I: 251.7A
 cos ϕ : 0.81
 U_t: 402.7V
 I_p A=379.247A
 I_p B=370.306A
 I_p C=375.742A
 I²t A=25.24kAAS
 I²t B=25.28kAAS
 I²t C=26.74kAAS
 T_{mb} A=409.4mS
 T_{mb} B=412.7mS
 T_{mb} C=412.4mS
 T_{arc} A=3.272mS
 T_{arc} B=6.521mS
 T_{arc} C=6.424mS

I: prospective current 预期电流有效值 cos ϕ : prospective power factor 预期功率因数
 U_t: test phase-to-phase voltage 测试电压 I_p: peak current 电流峰值 I²t: joule integral 焦耳能量
 T_{mb}: make-break time 通断时间 T_{arc}: arcing time 燃弧时间

IEC 60947-2

带电操作性能

Oscillogram: SSA231303-#10-03



Product: MCCB
 Type: 3P/250A
 No.: #10
 Sequence:
 EN1000
 I: 251.7A
 $\cos \phi$: 0.81

U_t : 402.7V

I_p A=364.701A
 I_p B=367.658A
 I_p C=379.407A

I^2t A=21.62kAAS
 I^2t B=22.01kAAS
 I^2t C=22.83kAAS

T_{mb} A=355.5mS
 T_{mb} B=355.2mS
 T_{mb} C=351.4mS

T_{arc} A=6.382mS
 T_{arc} B=6.043mS
 T_{arc} C=2.337mS

I: prospective current 预期电流有效值 $\cos \phi$: prospective power factor 预期功率因数

U_t : test phase-to-phase voltage 测试电压 I_p : peak current 电流峰值 I^2t : joule integral 焦耳能量

T_{mb} : make-break time 通断时间 T_{arc} : arcing time 燃弧时间

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List of test equipment used:

No.	Equipment	Model / Type	ID	Calibration due date
1	240kVA multi magnetic circuit transformer complete set of equipment	-----	ESR095	2024.11.06
2	Torque wrench	TLB0-20N.M	ESR145-05	2024.11.06
3	Portable data acquisition	Synegey	ESR025-02	2024.11.06
4	Temperature rise power supply	JCCK13002/400A	ESR055	2024.11.06
5	High and low temperature box	ZT100U	ESR079	2024.06.28
6	Impact pressure tester	GC-18/20kV	ESR048	2024.06.15
7	Insulation withstand voltage instrument	TOS5302	ESR070	2024.11.06
8	Mechanical life test bench	-----	ESR180	-----
9	Electronic second	PS-668	ESR102-01	2025.01.02
10	AC Medium Capacity Electrical Lifetime System	/	ESR006-09	-----
11	Mobile data acquisition instrument	-----	ESR186-01	2024.11.06
12	Digital torque driver	SNS-4	ESR174-02	2024.11.06
13	Torque wrench	TLB0-20N.M	ESR145-04	2024.11.06
14	AC Large Capacity Electrical Lifetime System	/	ESR005-5B	-----
15	Portable data acquisition	Synegey	ESR025-01	2024.11.06
16	Temperature rise characteristic power supply	800A	ESR175	2024.11.06
17	Temperature inspection instrument	34970A	ESR028-01	2024.06.15
18	Force Gauge	SF-500	ESR146	2024.11.06
19	Standard weight	0.3kg-22.7kg	ESR042-02	2024.11.09
20	Torque wrench	TLB0-20N.M	ESR145-01	2024.11.06

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No.	Equipment	Model / Type	ID	Calibration due date
21	AC100kAShort circuit system	-----	ESR002	2024.11.06
22	AC Medium Capacity Electrical Lifetime System	/	ESR006-11	-----
23	Mobile data acquisition instrument	-----	ESR186-02	2024.11.06
24	Temperature rise power supply	JCCK13002/800A	ESR056	2024.11.06
25	Temperature inspection instrument	34970A	ESR171	2024.06.15
26	Temperature control box	ET12020P1ABF	ESR051	2024.06.28
27	63kVA multi magnetic circuit system	TM6-63KVA/220/8	ESR080	2024.11.06
28	Digital Caliper	150mm	ESR106-01	2024.11.06
29	Glow Wire Tester	LSK-656H	ESR046	2024.06.15