TESTING
CNAS L3258

2011002903Z

TEST REPORT
IEC 60947-3
Low-voltage switchgear and controlgear
Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

Report Reference No.:V160016		
Tested by (name + signature).....:	LIN SHIFANG/CHEN ZHOU	
Approved by (name + signature).....:	WANG JIANXIN	
Date of issue: Aug. 7, 2012		
IEC 60947-3:2008 (Third Edition) + A1:2012 in conjunction with IEC 60947-1:2007 (Fifth Edition) + A1:2010		
Test conclusion :	Refer to the content of the report.	
Testing Laboratory.....:	Low-voltage Apparatus Laboratory (Wenzhou) of Zhejiang Academy of Science and Technology for Inspection and Quarantine	
Address.....:	699 Jixian Road. Economic and Technological Development Zone.Ruian.Zhejiang.China	
Post code.....:	325200	
Tel/Fax.....:	+86 0577-65158685 / +86 0577-65158688	
Email	ddsys@wz.ziq.gov.cn	
Applicant's Name .....:	Barfuse Electric Co.,Ltd.	
Address .....:	No. 15, Yonghe 3rd Road, Industry Function Zone, Chengdong St., Yueqing, Zhejiang, China	
Test item description		
Trademark .....:	/	
Manufacturer	Barfuse Electric Co.,Ltd.	
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.
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Any objection should be raised to the testing laboratory in 15 days since the day this report be received.

Photos:

Summary of testing:

The following tests were done on the samples.

	Sub-clause	Sample number
Test according to sub-clause	**8.3.6.2.1**	**#1**
	8.3.6.3	**#1**
	8.3.6.4	**#1**
	8.3.6.5	**#1**

Test item particulars..... :	
- method of operation..... :	Single pole operated three pole switches
- suitability for isolation..... :	suitable
- degree of protection..... :	/
- number of poles..... :	3
- kind of current..... :	AC
-in the case of a.c., number of phases and rated frequency..... :	3/50Hz
- number of positions of the main contacts (if more than two)..... :	/
-breaking arrangement for fused devices..... :	single break
Rated and limiting values, main circuit..... :	/
- rated operational voltage U_e (V)..... :	415
- rated insulation voltage U_i (V)..... :	/
- rated impulse withstand voltage U_{imp} (kV)..... :	/
- conventional free air thermal current I_{th} (A)..... :	250
- conventional enclosed thermal current I_{the} (A)..... :	/
- rated operational current I_e (A)..... :	250
- rated uninterrupted current I_u (A)..... :	/
- rated frequency (Hz)..... :	50Hz
- utilization category..... :	/
Short-circuit characteristic..... :	/
- rated short-time withstand current I_{cw} (kA)..... :	/
- rated short-time making capacity I_{cm} (kA)..... :	/
- rated conditional short-circuit current..... :	80kA
Control circuits..... :	/
Auxiliary circuits..... :	/
Relays and releases..... :	/
Co-ordination with short-circuit protective devices..... :	/
- kind of protective device..... :	/

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..... : 2016-12-26

Date (s) of performance of tests..... : 2016-12-29

General remarks:

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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.

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

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :

☐ **Yes**

☒ **Not applicable**

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

Name and address of factory (ies)..... :

General product information:

Ue=AC415V
Ie=AC250V

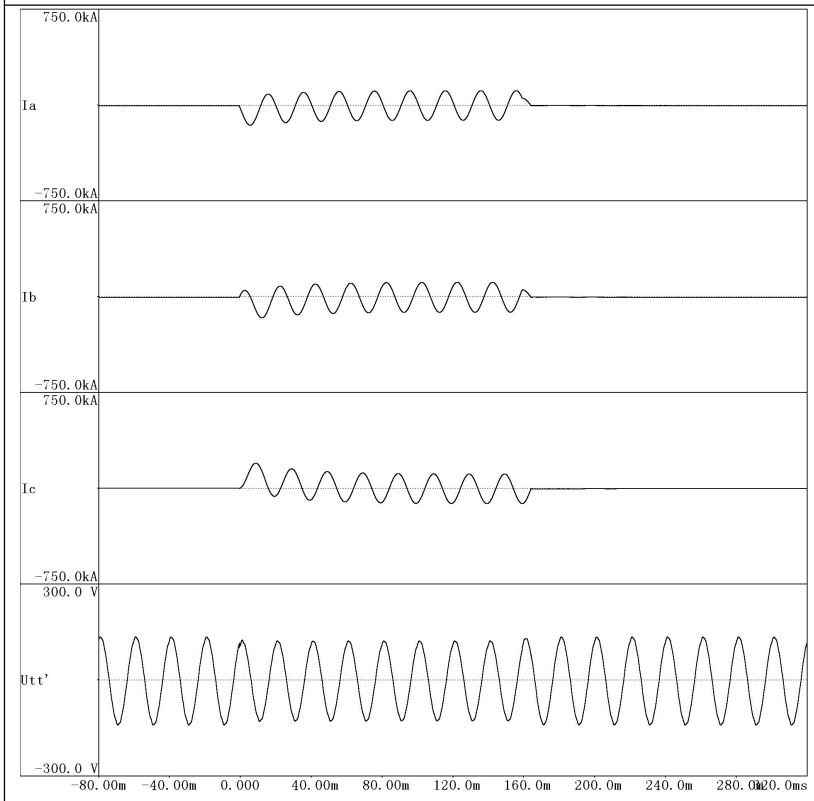
IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT		
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	SIEMENS	—
	- manufacturer's model or type reference .....:	NH1-gG	—
	- rated voltage (V) .....:	415V	—
	- rated current (A) .....:	250A	—
	- rated breaking capacity (kA) .....:	80kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 x Ue) (V) .....:	440	—
	test current (kA) .....:	82.20	—
	rated frequency (Hz) .....:	50	—
	power factor .....:	0.17	—
	Time constant (ms).....:	/	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 3.315 L2: 25.30 L3: 24.58	—
	- Joule integral I²dt (A²s) .....:	L1: 276.8 L2: 370100 L3: 209300	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:		—
	- point at which the measurement is made .....:	C phase	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	0.375	—
	- max. let-through current (kA) .....:	L1: 0 L2: 19.96 L3: 20.03	—
	- Joule integral I²dt (A²s) .....:	L1: L2: 319300 L3: 378300	—
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~.....:	1000V	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (1,1 Ue) (V) ..... :	457.0V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0.005mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIEMENS	—
	- manufacturer's model or type reference ..... :	NH1-gG	—
	- rated current (A) .....:	250A	—
	- power loss (W) ..... :	/	—
	- rated breaking capacity (kA) .....:	80kA	—
	- conductor cross-section (mm²) ..... :	120mm²	—
	- test current Ie (A) ..... :	250A	—
	Measured temperature-rise.....:	see appended table 8.3.6.5	P

8.3.6.5	**TABLE: Temperature-rise (measurements)**	
Temperature rise dT of part:	dT (K) measured	dT (K) required
Terminals	36.1	80
Manual operating means: metallic / non-metallic	15.2	35
Parts intended to be touched but not hand-held: metallic / non-metallic	31.7	50
Parts which need not be touched during normal operation	30.9	60
supplementary information:		

Record curves for short-circuit test

Three phases prospective Curve



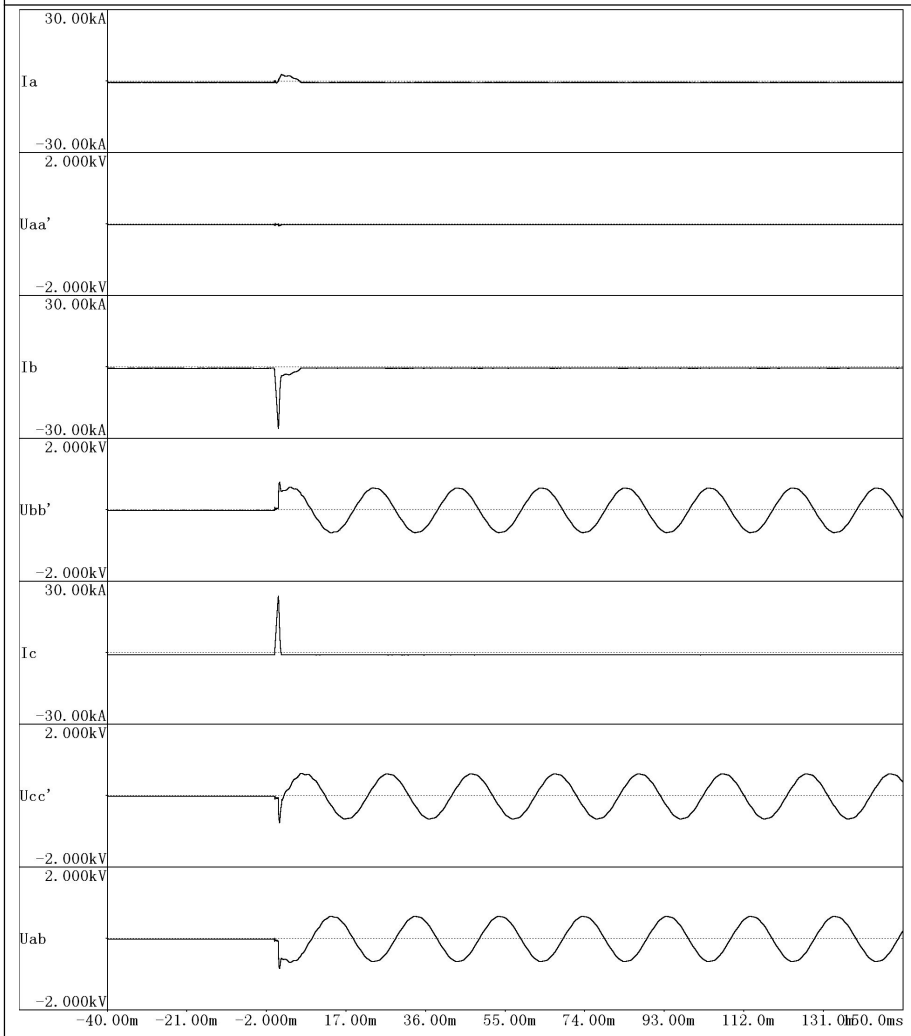
Curve No. : CW-F-3P-415V80000A0.2
Test voltage：440V

Ia= 81.73kA
Ib= 82.82kA
Ic= 82.05kA
average current I= 82.20kA

Ipmax= 182.2kA

Cosa= 0.183
Cosb= 0.165
Cosc= 0.154
average CosΦ= 0.167

Fuse protected short-circuit withstand a)withstand test



Curve No.：V160016#1-1
Description of product ：switch-disconnect
Specification of product：3P/250A
Sample No.：#1
Test sequence：O
Test voltage：440V
Prospective current：82.20kA
Prospective PF：0.167

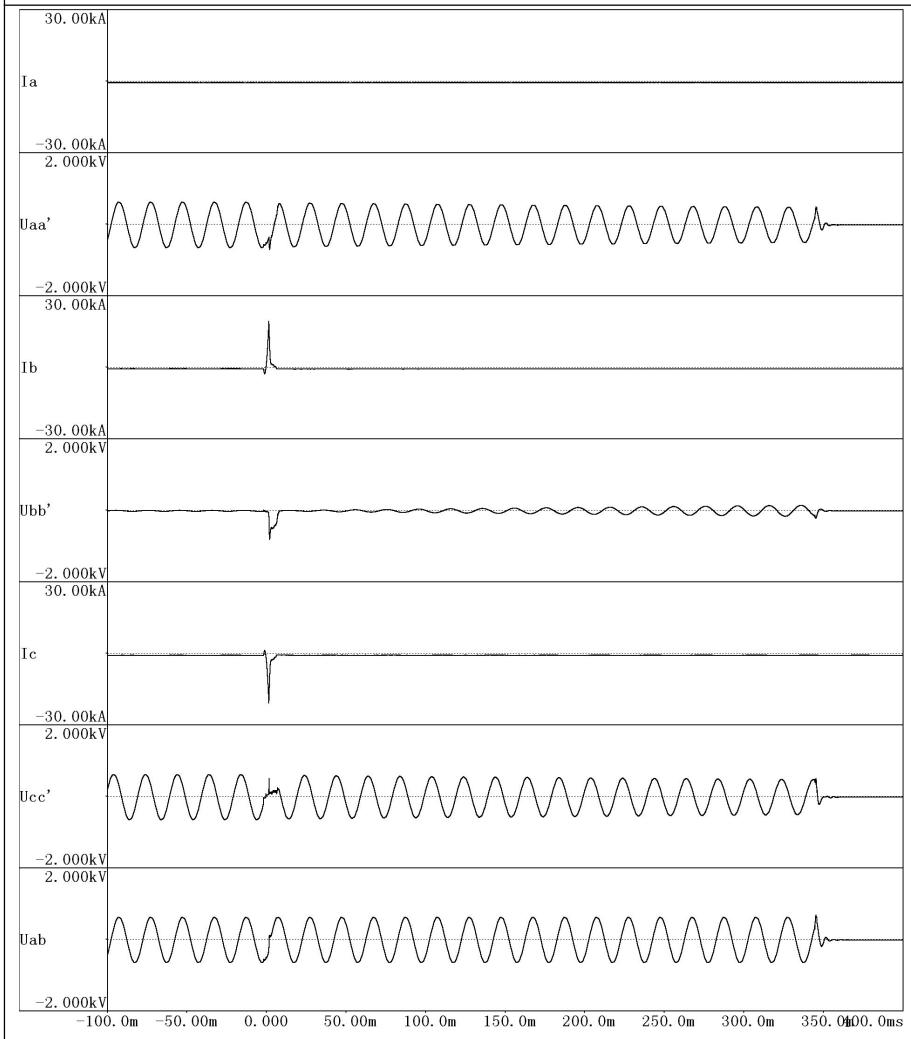
Ipa= 3.315kA
Ipb= 25.30kA
Ipc= 24.58kA

I^2ta= 276.8 AAS
I^2tb= 386.1kAAS
I^2tc= 209.3kAAS

Make-break time Tta= 2.680ms
Make-break time Ttb= 6.477ms
Make-break time Ttc= 1.745ms

Arcing time Tra= 2.680ms
Arcing time Trb= 5.410ms
Arcing time Trc= 910.0μs

Fuse protected short-circuit withstand b) Making test



Curve No.：V160016#1-2
Description of product ：switch-disconnect
Specification of product：3P/250A
Sample No.：#1
Test sequence：M
Test voltage：440V
Prospective current：82.20kA
Prospective PF：0.167

Ipa= --A
Ipb= 19.96kA
Ipc= 20.03kA

I^2ta= --AAS
I^2tb= 319.3kAAS
I^2tc= 378.1kAAS

Make-break time Tta= --ms
Make-break time Ttb= 6.960ms
Make-break time Ttc= 6.820ms

Arcing time Tra= --ms
Arcing time Trb= 6.960ms
Arcing time Trc= 6.820ms

List of test equipment used:
(Note: This is an example of the required attachment. Other forms with a different layout but containing similar information are also acceptable.)

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
8.3.6.2.1	Fuse protected short-circuit withstand	AC A200kA Short-circuit System ESR001	10kA~200kA	2018-1-16
		Torque driver ESR052	0-50Nm	2018-1-16
8.3.6.3	Dielectric verification	Withstand Voltage Device ESR070	AC Output 0.05kV~5kV; AC Leakage Current 0.01mA~110mA; DC Output 0.05kV~6kV;DC Leakage Current 0.01mA~11mA	2018-1-16
8.3.6.4	Leakage current	Withstand Voltage Device ESR070	AC Output 0.05kV~5kV; AC Leakage Current 0.01mA~110mA; DC Output 0.05kV~6kV;DC Leakage Current 0.01mA~11mA	2018-1-16
8.3.6.5	Temperature-rise verification	Data Acquisition Device(Temperature) ESR028-01	0~400℃	2018-1-14
		63KVA three phases muti-magnetic transformer ESR080	200A-4000A	2018-1-14