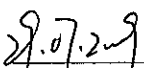

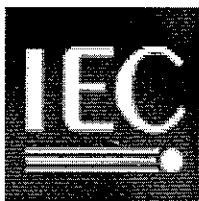


Produkte
Products

Prüfbericht - Nr.: 15032525 001 <i>Test Report No.:</i>		Seite 1 von 1 Page 1 of 1	
Auftraggeber: <i>Client:</i>		Wenzhou Jinlida Electrical Co., Ltd. Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604, P.R. China	
Gegenstand der Prüfung: <i>Test item:</i>		Low-voltage Fuse	
Bezeichnung: <i>Identification:</i>	NH00	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	153123295	Eingangsdatum: <i>Date of receipt:</i>	22.06.2009
Prüfport: <i>Testing location:</i>	Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China		
Prüfgrundlage: <i>Test specification:</i>	IEC 60269-1:2006 IEC 60269-2:2006		
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>		
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.		
geprüft/ tested by:		kontrolliert/ reviewed by:	
	Kenny Shi/PE		Bo Xia/Reviewer
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
29.07.2009			30.07.2009
Sonstiges/ Other Aspects:			
This report consists of two parts: Part I for IEC 60269-1:2006. Part II for IEC 60269-2:2006.			
Abkürzungen:	P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet	Abbreviations:	P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			



Test Report issued under the responsibility of:

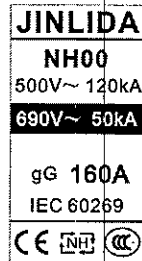


TEST REPORT IEC 60269-1 Low-voltage fuses Part 1: General requirements	
Report Reference No. : 15032525 001 Part I Date of issue : 30.07.2009 Total number of pages : 50 pages	
Testing Laboratory : TÜV Rheinland (Shanghai) Co., Ltd. Address : 10-15/F, Huatsing Building, No.88, Lane 777, Guangzhong Road West, 200072 Shanghai Zhabei District, P.R. China	
Applicant's name : Wenzhou Jinlida Electrical Co., Ltd. Address : Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604 P.R. China	
Test specification: Standard : IEC 60269-1:2006 (Fourth edition) Test procedure : CB Non-standard test method : N/A	
Test Report Form No. : IEC60269_1A Test Report Form(s) Originator : EZU Master TRF : Dated 2009-04	
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Test item description : Fuses (fuse-link and fuse-base) Trade Mark : JINLIDA Manufacturer : Same as applicant Model/Type reference : NH00 Ratings : AC 500V; 16A,20A,25A,32A,40A,50A,63A,80A,100A,125A,160A; 120kA; Size 00	

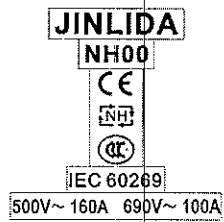
Testing procedure and testing location:	
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address.....:	TÜV Rheinland (Shanghai) Co., Ltd. Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
<input type="checkbox"/> Associated CB Test Laboratory: Testing location/ address.....:	
Tested by (name + signature).....: Approved by (+ signature):	
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature):	
Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature).....: Approved by (+ signature):	
Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature):	
Supervised by (+ signature).....: Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature):	
Supervised by (+ signature).....: Testing location/ address.....:	

Summary of testing:	
Tests performed (name of test and test clause): For homogeneous series of NH00, type tests are listed in table 11, 12, 13 and 14 in EN 60269-1:2006	Testing location: Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
Summary of compliance with National Differences: N/A	

Copy of marking plate:



Marking plate of fuse-link



Marking plate of fuse-base

Test item particulars:	
Fuse-holder	Yes/No
Fuse-base	Yes/No
Fuse-carrier	Yes/No
Fuse-link.....	Yes/No
Fuse for use by authorized persons	Yes/No
Fuse for use by unskilled persons	Yes/No
.....:	
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	06.2009
Date (s) of performance of tests	06.2009-07.2009
General remarks:	
<p>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. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>	
General product information:	
N/A	

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	CHARACTERISTICS OF FUSES		
5.2	Rated voltage (V) as specified	AC 500V	P
5.3.1	Rated current (A) of the fuse-link in accordance with specified values	16A,20A,25A,32A,40A,50A,63 A,80A,100A,125A,160A	P
5.3.2	Rated current (A) of the fuse-holder	160A	P
5.4	Rated frequency (Hz)	50Hz	P
5.5	Max. rated power dissipation (VA) of fuse-link	<=12W	P
	Rated acceptable power dissipation (VA) of fuse-holder	12W	P
5.6	Limits of time-current characteristics based on reference ambient air temperature Ta of +20°C		P
5.6.1	Time-current zones deviated from standardized, or available in manufacturers documentation (with tolerances)		P
5.6.2	Conventional times and currents see Table 2		P
5.6.3	Gates		P
5.7	Breaking range and breaking capacity	120kA	P
5.7.1	Breaking range and utilization category	gG	P
5.7.2	Rated breaking capacity (A) of fuse-link corresponds to the rated voltage (V), and is equal or higher than given minimum (A) in subsequent part of this standard	120kA	P
5.8	Cut-off current and I ² t characteristics are referred to the values of voltage, frequency and power factor		P
5.8.1	Cut-off current characteristics, if required, given by the manufacturer according to Figure 4		P
5.8.2	Pre-arcing I ² t characteristics for pre-arcing times of less than 0,1 s down to a time corresponding to the rated breaking capacity given by the manufacturer :		P
	The operating I ² t characteristics with specified voltages as parameter for pre-arcing times less than 0,1 s given by the manufacturer		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
6	MARKINGS		
	Markings are durable and easily legible		P
6.1	Fuse-holders marked by:		P
	- name of manufacturer or trade mark which enable identification of fuse-holder	JINLIDA	P
	- manufacturer's identification reference enabling to find all characteristics listed in 5.1.1	NH00	P
	- rated voltage (V)	500V	P
	- rated current (A)	160A	P
	- kind of current and rated frequency (Hz)	AC and 50Hz	P
6.2	Fuse-link(s) except small fuse-link(s) marked by:		P
	- name of manufacturer or trade mark which enable identification of fuse-links	JINLIDA	P
	- manufacturer's identification reference enabling to find all characteristics listed in 5.1.2	NH00	P
	- rated voltage (V)	500V	P
	- rated current (A)	16~160A	P
	- breaking range and utilization category (if applicable) (5.7.1)	gG	P
	- kind of current	AC	P
	- rated frequency (Hz), if applicable (5.4)	50Hz	P
	Small fuse-links marked by:		N/A
	- trademark		N/A
	- list reference of manufacturer		N/A
	- rated voltage (V)		N/A
	- rated current (A)		N/A
6.3	Symbols for the kind of current and frequency in accordance with IEC 60417		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
7	STANDARD CONDITIONS FOR CONSTRUCTION		
7.1	Mechanical design		P
7.1.1	Replacement of fuse-links easily and safely		P
7.1.2	Connections, including terminals		P
	Contact force is not transmitted through insulating material other than ceramic or other material with characteristics not less suitable, unless		P
	there is sufficient resilience in the metallic parts to compensate any possible shrinkage or other deformation of the insulating material		P
	Terminals cannot turn or be displaced when the connecting screws are tightened		P
	Terminals shall be such, that the conductors cannot be displaced		P
	Parts gripping the conductors are of metal		P
	Gripping parts cannot unduly damage conductors		P
	Terminals readily accessible under the intended conditions of installation		P
7.1.3	Fuse-contacts		P
	Fuse-contacts are such that necessary contact force is maintained under the conditions of service and operation		P
	Contact is such that electromagnetic forces occurring during operation under conditions in accordance with 7.5 not impair electrical connections between		P
	a) fuse-base and fuse-carrier		N/A
	b) fuse-carrier and fuse-link		N/A
	c) fuse-link and fuse-base		P
	Fuse contacts are so constructed and of such material that, when fuse is properly installed and service conditions are normal, adequate contact is maintained		P
	a) after repeated engagement and disengagement		P
	b) after being left undisturbed in service for long period		P
7.1.4	Construction of a gauge-piece		P
	Gauge-piece is so designed that it withstands normal stresses occurring during use		P

IEC 60269-1				
Clause	Requirement + Test		Result - Remark	Verdict
7.1.5	Mechanical strength of fuse-link			P
	Fuse-link have adequate mechanical strength and its contacts are securely fixed			P
7.2	Insulating properties and suitability for isolation			P
	Fuses are such that they do not lose insulating properties at voltages to which they are subjected in normal service			P
	Fuse passes the tests for verification of insulating properties and suitability for isolation in accordance with 8.2			P
7.3	Temperature rise, power dissipation of the fuse-link and acceptable power dissipation of the fuse-holder			P
	See Table 5			P
	Requirements are verified by tests according to 8.3			P
7.4	Operation			P
	Fuse-link is so designed and proportioned that, when tested in its appropriate test arrangement at rated frequency and ambient air temperature of $(20 \pm 5)^\circ\text{C}$			P
	- is able to carry continuously any current not exceeding its rated current			P
	- is able to withstand overload conditions as they may occur in normal service (see 8.4.3.4)			P
	Fuse-link satisfy these conditions if it passes the tests prescribed in 8.4			P
7.5	Breaking capacity			P
	Fuse is capable of breaking, at rated frequency and at voltage not exceeding the recovery voltage specified in 8.5, any circuit having prospective current between			P
	- current I_f (for "g" fuse-links)			P
	- current $k_2 I_n$ (for "a" fuse-links)			N/A
	- for a.c., rated breaking capacity at power factors not lower than those in Table 20			P
	- for d.c., rated breaking capacity at time constants not greater than those limits in Table 21			N/A
	Arc voltage not exceed values given in Table 6.....			P
	Fuse satisfy these conditions if it passes the tests prescribed in 8.5			P
7.6	Cut-off current characteristic			P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Values of cut-off current measured as specified in 8.6 are less than, or equal to, the values corresponding to cut-off current characteristics assigned by the manufacturer		P
7.7	I ² t characteristics		P
	Pre-arcing I ² t values verified according to 8.7 (Table 7)		P
	Operating I ² t values verified according to 8.7		P
7.8	Overcurrent discrimination of fuse-links		P
7.9	Protection against electric shock		P
	The degree of protection when the fuse is under normal service conditions:	IP00	P
	The degree of protection when replacing the fuse-link:	IP00	P
	The degree of protection when the fuse-link and fuse-carrier is removed:	IP	N/A
7.9.1	Clearances and creepage distances		P
	Clearances are not less than the values given in Table 9		P
	Creepage distances correspond to material group, as defined in 2.7.1.3 of IEC 60664-1, corresponding with rated voltage given in Table 10	500V	P
7.9.2	Leakage currents of equipment suitable for isolation		N/A
	Value of leakage current (mA) not exceed		N/A
	- 0,5 mA per pole for fuses in new conditions		N/A
	- 2 mA per pole for fuses having been submitted to test according to 8.5		N/A
7.9.3	Additional constructional requirements for fuses with non-separable fuse-carriers, suitable for isolation		N/A
	Fuse-holder are marked with the symbol IEC 60617-S00369		N/A
	When fuse is in open position, with fuse-link remaining inside the fuse-carrier, isolating distance between the fuse contacts in accordance with the isolating function are provided		N/A
	Indication of this position is provided by the position of the fuse-carrier		N/A

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	There exists a locking means in order to lock the fuses in the isolated position, locking is possible only in this position		N/A
	Fuses are designed so that the fuse-carrier remains attached to the fuse-base giving correct indication of the open position, and of locking		N/A
7.10	Resistance to heat		P
	All components are sufficiently resistant to heat which may occur in normal use (see 8.9 and 8.10)		P
7.11	Mechanical strength		P
	All components of fuse are sufficiently resistant to mechanical stresses which may occur in normal use (see 8.3 to 3.5 and 8.11.1)		P
7.12	Resistance to corrosion		P
	All metallic components of fuse are resistant to corrosive influences which may occur in normal use		P
7.12.1	Resistance to rusting		P
	Ferrous components are so protected that they meet relevant tests (see 8.2.4.2 and 8.11.2.3)		P
7.12.2	Resistance to season cracking		P
	Current-carrying parts are sufficiently resistant to season cracking (see 8.2.4.2 and 8.11.2.1)		P
7.13	Resistance to abnormal heat and fire		P
	All components of fuse are sufficiently resistant to abnormal heat and fire (see 8.11.2.2)		P
7.14	Electromagnetic compatibility		N/A
	Fuses within the scope of this standard are not sensitive to normal electromagnetic disturbances		N/A
	No immunity tests are required		N/A

IEC 60269-1				
Clause	Requirement + Test		Result - Remark	Verdict
8	TESTS			
8.1.2	At the beginning of each test, the fuse is approximately at the ambient temperature			P
8.1.3	Tests made on fuses in clean and dry condition			P
8.1.4	Arrangement of the fuse and dimensions			P
	Except for degree of protection test (see 8.8), fuse are mounted in free air in draught-free surroundings in the normal operation position and on insulating material of sufficient rigidity			P
	Before tests are started, specified external dimensions are measured and results compared with dimensions specified in the relevant data sheet of the manufacturer or specified in subsequent parts		Part II	P
8.1.5	Testing of fuse-links			P
	Fuse-links tested with the kind(s) of current for which they are rated			P
	Fuse-links tested for a.c. with frequency for which they are rated			P
8.1.5.1	Complete tests			P
	Internal resistance R measured by a current $\leq 0,1 I_n$			P
	Measuring current (A)			P
	Ambient air temperature in range of $20 \pm 5 \text{ }^\circ\text{C}$			P
	The values of resistance		(see appended table)	P
8.1.5.2	Testing of fuse-links of a homogeneous series			P
	Fuse-links tested like a homogeneous series		Yes/No	P
	If yes: fuse-links have identical enclosures in form and construction (except of fuse-elements and contacts)			P
	- the same arc-extinguishing medium and same completeness of filling			P
	- fuse-elements of identical materials			P
	- their cross-section of fuse-elements not exceed the cross-section of fuse-links having the highest rated current			P
	- number of fuse-elements do not exceed number of fuse-elements of fuse-links with the highest rated current			P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum distances between adjacent fuse-elements and between the fuse-elements and the inner surface of the cartridge is not less than those in the fuse-link with the highest rated current		P
	- fuse-links used with a given fuse-holder, or		P
	- fuse-links intended to be used in an arrangement identical for all rated currents of the homogeneous series		N/A
	- value of $R I_n^{3/2}$ does not exceed the value for the fuse-link with largest rated current of the homogeneous series (R measured as indicated in 8.1.5.1)		N/A
	the rated breaking capacity of fuse-links not greater than that of the fuse-link with the largest rated current within the homogeneous series		P
	- if not, the fuse-links with greater breaking capacity subjected to tests no. 1 and no. 2		N/A
	The fuse-link having the largest rated current tested completely according to Table 11		P
	The fuse-link having the smallest rated current tested only according to Table 12		P
	The fuse-links between the largest and smallest rated current tested according to Table 13		P
8.1.6	Testing of fuse-holders		P
	The fuse-holders are subjected to the tests according to Table 14		P
8.2	Verification of the insulating properties and of the suitability for isolation		P
8.2.1	Arrangement of the fuse-holder		P
	The fuse-holder fitted with a fuse-links of the largest dimensions for the type of fuse-holder concerned		P
	The fuse-base fixed to a metal plate, unless otherwise specified		P
	Fuse-link is replace while live - surfaces of fuse-link, of device for replacing it or of fuse-carrier, if of insulating material, are provided with metal coverings connected during tests to the frame of the apparatus; if of metal, they are connected direct to the frame		P
8.2.2	Verification of the insulating properties		P
	Points of application of the test voltage		P
	The test voltage is applied between:		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	a) live parts and the frame with the fuse-link and the device for replacing it, or		P
	the fuse-carrier, if any, in position		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		P
	b) the terminals without fuse-link, device for replacing or the fuse-carrier		P
	no breakdown of insulation or flashover during 1 min of the applying test voltage		P
	c) live parts of different polarity in the case of multipole fuse-holder with fuse-links, fuse-carrier(s) or device(s) for replacing the fuse-links		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		N/A
	d) live parts which in the case of a multipole fuse-holder reach different potential after the fuse-link operates (equipped by fuse-carrier or device for replacing without fuse-link)		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		N/A
	The r.m.s. value of test voltage (V) as specified in Table 15	1890V	P
8.2.2.3.2	Fuse-holder is subjected to humid atmospheric conditions		P
	Relative humidity of ambient air (%)	91-95	P
	Ambient air temperature (°C)	20-30	P
	Duration of treatment (h)	144	P
	Insulation resistance is measured between the points prescribed in 8.2.2.1 by applying d.c. voltage of approximately 500 V		P
	Points of measuring:		P
	a) min. measured value (MΩ)	200MΩ	P
	b) min. measured value (MΩ)	200MΩ	P
	c) min. measured value (MΩ)		N/A
	d) min. measured value (MΩ)		N/A
	The insulation resistance not less than MΩ	1MΩ	P
8.2.3	Verification of the suitability for isolation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Clearances larger than values given in Table 9 are verified by dimensional measurement or by voltage test		N/A
	Points of application of the test voltage		N/A
	The test voltage is applied between:		N/A
	- terminals when the fuse-link and device for replacing it, are removed		N/A
	Test voltage (kV) for verification of the rated impulse withstand voltage is given in Table 16	kV	N/A
	The 1,2/50 μ s impulse voltage applied 5 times for each polarity at intervals of 1 s minimum		N/A
	no breakdown of insulation or flashover during of the applying test voltage		N/A
	no disruptive discharge during the test		N/A
8.2.4.2	Fuse-holder is subjected to humid atmospheric conditions		N/A
	Relative humidity of ambient air (%)		N/A
	Ambient air temperature ($^{\circ}$ C)		N/A
	Duration of treatment (h)		N/A
	Insulation resistance is measured between the points prescribed in 8.2.2.1 by applying d.c. voltage of approximately 500 V		N/A
	Points of measuring:		N/A
	a) min. measured value (M Ω)		N/A
	b) min. measured value (M Ω)		N/A
	c) min. measured value (M Ω)		N/A
	d) min. measured value (M Ω)		N/A
	The insulation resistance not less than 1 M Ω		N/A
8.3	Verification of temperature rise and power dissipation		P
8.3.1	One fuse used for test (unless otherwise stated by the manufacturer) mounted in free air		P
	Test performed at an ambient air temperature of (20 \pm 5) $^{\circ}$ C		P
	Ambient air temperature during the test ($^{\circ}$ C)		P
	Cross-sectional area (see Table17) (mm ² or mm x mm)	70 mm ²	-

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Tightened by torque; torque (Nm)	10Nm	-
8.3.2	The temperature of the fuse measured by method of measuring	Thermocouple	P
8.3.3	Measurement of the power dissipation of the fuse-link		P
	One fuse used for test (unless otherwise stated by the manufacturer) mounted in free air		P
	Test performed at an ambient air temperature of (20±5) °C		P
	Ambient air temperature during the test (°C)	20°C	P
	Cross-sectional area (see Table17) (mm ² or mm x mm)	70 mm ²	-
	Tightened by torque; torque (Nm)	10Nm	-
8.3.4.1	Temperature rise of the fuse-holder		P
	Applied a.c. current (A) for test equal to the rated current of the fuse-holder	160A	P
	Test made with fuse-link (A), or	160A	P
	with a dummy fuse-link specified in subsequent parts	Part II	P
	Temperature rise limits T for contacts and terminals (Table 5):		P
	spring loaded contacts; limit (K)	unenclosed / enclosed max. 44K<65K	P
	bolted contacts; limit (K)	unenclosed / enclosed	N/A
	terminals; limit (K)	unenclosed / enclosed max. 44K<65K	P
8.3.4.2	Power dissipation of a fuse-link		P
	The test made with a.c. at the current (A) equal to the rated current of the fuse-link	160A	P
	The points of measuring	Central of blade	P
	Measured value of power (W) dissipation in limits (W) specified in subsequent parts	10,3W<12W	P
8.3.5	The acceptable power dissipation (W) of fuse-holder not less than the rated power dissipation of the corresponding fuse-links		P
	After the tests prescribed in 8.3, the insulating parts of the fuse-holders cooled down to ambient temperature withstood the test voltage according to 8.2	1890V	P

IEC 60269-1				
Clause	Requirement + Test		Result - Remark	Verdict
	No deformation after tests of 8.3			P
8.4	Verification of operation		For 160A	P
8.4.1	The test arrangement as specified in 8.1.4			P
	Length (m) of conductors (see 8.3.1)..... :		2m	P
	their cross-sectional area (mm ²) as specified in Table 17 :		70	P
8.4.2	Ambient air temperature during test within (20±5) °C			P
8.4.3.1	Verification of conventional non-fusing and fusing current			P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :		200A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2) :		2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2) :		256A	-
	the fuse-link operated within the conventional time of (minutes) (Table 2) :		57,3min	P
8.4.3.2	Verification of rated current of "g" fuse-links			P
	One fuse-link submitted to a pulse test for 100 h			P
	On-period equal to conventional time (h) :		2h	P
	Off-period of 0,1 of the conventional time :		12min	P
	Test current (A) equal to 1,05 of the rated current . :		168A	P
	After the test, the fuse-link not have changed its characteristics			P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :		200A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2) :		2h	P
8.4	Verification of operation		For 125A	P
8.4.1	The test arrangement as specified in 8.1.4			P
	Length (m) of conductors (see 8.3.1)..... :		2m	P
	their cross-sectional area (mm ²) as specified in Table 17 :		50	P
8.4.2	Ambient air temperature during test within (20±5) °C			P
8.4.3.1	Verification of conventional non-fusing and fusing current			P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	156,3A	–
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		–
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	2h	P
	Off-period of 0,1 of the conventional time	12min	P
	Test current (A) equal to 1,05 of the rated current . :	131,3A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	156,3A	–
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
8.4	Verification of operation	For 100A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	35	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	125A	–
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		–
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P

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Clause	Requirement + Test	Result - Remark	Verdict
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h) :	2h	P
	Off-period of 0,1 of the conventional time :	12min	P
	Test current (A) equal to 1,05 of the rated current . :	105A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	125A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2) :	2h	P
8.4	Verification of operation	For 80A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17 :	25	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	100A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2) :	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2) :		-
	the fuse-link operated within the conventional time of (minutes) (Table 2) :		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h) :	2h	P
	Off-period of 0,1 of the conventional time :	12min	P
	Test current (A) equal to 1,05 of the rated current . :	84A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	100A	-

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Clause	Requirement + Test	Result - Remark	Verdict
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
8.4	Verification of operation	For 63A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	16	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	78,7A	–
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		–
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	1h	P
	Off-period of 0,1 of the conventional time	6min	P
	Test current (A) equal to 1,05 of the rated current . :	66,2A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	78,7A	–
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
8.4	Verification of operation	For 50A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	10	P
8.4.2	Ambient air temperature during test within (20±5) °C		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	62,5A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	1h	P
	Off-period of 0,1 of the conventional time	6min	P
	Test current (A) equal to 1,05 of the rated current ..	52,5A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	62,5A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
8.4	Verification of operation	For 40A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	10	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	50A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-

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Clause	Requirement + Test	Result - Remark	Verdict
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	1h	P
	Off-period of 0,1 of the conventional time	6min	P
	Test current (A) equal to 1,05 of the rated current . :	42A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	50A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
8.4	Verification of operation	For 32A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	6	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	40A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	1h	P
	Off-period of 0,1 of the conventional time	6min	P
	Test current (A) equal to 1,05 of the rated current . :	33,6A	P
	After the test, the fuse-link not have changed its characteristics		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I_{nf}) (see Table 2)	40A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
8.4	Verification of operation	For 25A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	4	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I_{nf}) (see Table 2)	31,3A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I_f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	1h	P
	Off-period of 0,1 of the conventional time	6min	P
	Test current (A) equal to 1,05 of the rated current ..	26,3A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I_{nf}) (see Table 2)	31,3A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
8.4	Verification of operation	For 20A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	2,5	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	25A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	1h	P
	Off-period of 0,1 of the conventional time	6min	P
	Test current (A) equal to 1,05 of the rated current . :	21A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	25A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
8.4	Verification of operation	For 16A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	2,5	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	20A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-

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Clause	Requirement + Test	Result - Remark	Verdict
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	1h	P
	Off-period of 0,1 of the conventional time	6min	P
	Test current (A) equal to 1,05 of the rated current . :	16,8A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	20A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	1h	P
8.4.3.3	Verification of time-current characteristics and gates		P
8.4.3.3.1	The time-current characteristics verified on the basis of the test according to 8.5		P
	Values of pre-arcing and operating times within the time-current zones:		P
	- indicated by the manufacturer		N/A
	- specified in subsequent parts	Part II	P
	Verification for smaller current ratings, if only one largest rated current fuse-link is subjected to the test according to 8.5 (in case of homogeneous series):		N/A
	"g" fuse-links (except "gD", "gG" and "gM")		N/A
	Tests made in connection with verification of the gates (see 8.4.3.3.2)		N/A
	Ambient air temperature within (20±5) °C		N/A
	rated current I _n (A) of the fuse-link		-
	test performed at voltage (V)		-
	test 3a) prospective current (A) equal to kI _n (10 ≤ k ≤ 20)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	test 4a) prospective current (A) equal to kI _n (5 ≤ k ≤ 8)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	test 5a) prospective current (A) equal to kI_n ($2,5 \leq k \leq 4$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	Verification for smaller current ratings, if only one largest rated current fuse-link is subjected to the test according to 8.5 (in case of homogeneous series):		N/A
	"a" fuse-links		N/A
	Ambient air temperature within $(20 \pm 5) ^\circ\text{C}$		N/A
	rated current I_n (A) of the fuse-link		-
	test performed at voltage (V)		-
	test 3a) prospective current (A) equal to $nk_2 I_n$ ($5 \leq n \leq 8$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	test 4a) prospective current (A) equal to $nk_2 I_n$ ($2 \leq n \leq 3$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	test 5a) prospective current (A) equal to $nk_2 I_n$ ($1 \leq n \leq 1,5$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	160	-
	test performed at voltage (V)	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s	460A;54s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	950A;3,3s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	1450A;638ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	2590A;10ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-

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Clause	Requirement + Test	Result - Remark	Verdict
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)	125	-
	test performed at voltage (V)	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s	355A;68s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	715A;2,8s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	1100A;626ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	1910A;9ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)		-
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P

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Clause	Requirement + Test	Result - Remark	Verdict
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	100	-
	test performed at voltage (V) :	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s :	290A;54s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	580A;3,0s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	820A;800ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	1450A;8ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		-
	test performed at voltage (V) :		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		-
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	80	-
	test performed at voltage (V) :	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s :	215A;64s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	425A;2,6s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	610A;780ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	1100A;9ms	P
	"aM" fuse-links		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	rated current of the fuse-link (A)..... :		–
	test performed at voltage (V) :		–
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		–
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	“gG” and “gM” fuse-links	“gG” / “gM”	P
	rated current of the fuse-link (A)..... :	63	–
	test performed at voltage (V) :	Not specified	–
	a) testing current (A); pre-arcing time (s) higher than 10 s :	160A;78s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	320A;2,9s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	450A;680ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	820A;8ms	P
	“aM” fuse-links		N/A
	rated current of the fuse-link (A)..... :		–
	test performed at voltage (V) :		–
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		–
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	50	–
	test performed at voltage (V) :	Not specified	–
	a) testing current (A); pre-arcing time (s) higher than 10 s :	125A;60s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	250A;3,1s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	350A;706ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	610A;9ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		–
	test performed at voltage (V) :		–
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		–
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	40	–
	test performed at voltage (V) :	Not specified	–
	a) testing current (A); pre-arcing time (s) higher than 10 s :	95A;62s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	190A;2,8s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	260A;680ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	450A;8ms	P

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Clause	Requirement + Test	Result - Remark	Verdict
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		-
	test performed at voltage (V) :		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		-
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	32	-
	test performed at voltage (V) :	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s :	75A;80s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	150A;3,1s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	200A;820ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	350A;10ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		-
	test performed at voltage (V) :		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		-
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	25	-
	test performed at voltage (V)	Not specified	--
	a) testing current (A); pre-arcing time (s) higher than 10 s	52A;78s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	110A;2,9s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	150A;760ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	260A;9ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm).....		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	20	-
	test performed at voltage (V)	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s	42A;110s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	85A;3,4s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	110A;820ms	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) testing current (A); pre-arcing time (s) less than 0,1 s	200A;10ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm).....		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	16	-
	test performed at voltage (V)	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s	33A;108s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	65A;3,4s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	85A;780ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	150A;10ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm).....		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.4	Overload	For 16A and 160A	P
	The test arrangement is same as that for the temperature rise test (see 8.3.1)		P
	Three fuse-links submitted to 50 pulses having the same duration and test current		P
	test performed at voltage (V)	Not specified	
	"g" fuse-links:		P
	test current (A) equal to 0,8 times the current stated for a pre-arcing time of 5 s	30,4A/464A	P
	duration of each pulse 5 s		P
	time (s) interval between pulses equal to 20 % of the conventional time (s) specified in Table 2	12min/24min	P
	"a" fuse-links:		N/A
	rated current I_n (A) of fuse-link		N/A
	test current (A) equal to $k_1 I_n \pm 2\%$		N/A
	the pulse duration (s) corresponds to that indicated on the overload curve for $k_1 I_n$ stated by manufacturer		N/A
	time (s) intervals between pulses equal to 30 times the pulse duration		N/A
	fuse-links having ambient air temperature subjected to a current (A) equal to current for the overload test	30,4A/464A	P
	pre-arcing time (s) of sample lies within the manufacturers time-current zone	1) 68s/64,9s 2) 74s/46,3s 3) 72s/57,2s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	70	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	160A	P
	for a time (h) equal to the conventional time	2h	P

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Clause	Requirement + Test	Result - Remark	Verdict
	test current increased to 1,45 I _z (A) (I _z specified in Table 19)	243,6A	P
	the fuse-link operated in time (s) less than the conventional time (s)	5207s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	25	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	80A	P
	for a time (h) equal to the conventional time	2h	P
	test current increased to 1,45 I _z (A) (I _z specified in Table 19)	123,3A	P
	the fuse-link operated in time (s) less than the conventional time (s)	3798s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	16	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	63A	P
	for a time (h) equal to the conventional time	1h	P
	test current increased to 1,45 I _z (A) (I _z specified in Table 19)	91,4A	P
	the fuse-link operated in time (s) less than the conventional time (s)	4007s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	4	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	25A	P
	for a time (h) equal to the conventional time	1h	P
	test current increased to 1,45 I _z (A) (I _z specified in Table 19)	39,2A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	the fuse-link operated in time (s) less than the conventional time (s)	3452s	P
8.4.3.6	Operation of indicating devices and strikers, if any		P
	Operation of indicating device verified in combination with the verification of breaking capacity (see 8.5.5)		P
	The verification of striker operation:		N/A
	"g" fuse-link tested at current (A) equal to current I_4 (see Table 20 and 21)		N/A
	recovery voltage (V)		N/A
	stated recovery voltage (V)		N/A
	"a" fuse-link tested at current (A) equal to current $2k_1 I_n$ (A) (see Figure 2)		N/A
	recovery voltage (V)		N/A
	stated recovery voltage (V)		N/A
	Striker operate during all tests made at recovery voltage of at least 20 V		N/A
	No failure of indicating device or striker		P
8.5	Verification of the breaking capacity		P
8.5.1	The test arrangements as specified in 8.1.4		P
8.5.2	Characteristics of the test circuit as specified		P
	Scheme of test circuit (see Figure 5)		P
	Deviations form specified characteristics of test circuit		P
8.5.3	Measuring instruments		P
8.5.4	Calibration of test circuit		P
	Calibration oscillograms and their evaluation		P
8.5.6	The breaking-capacity tests made at an ambient air temperature of $(20 \pm 5) ^\circ\text{C}$		P
	Breaking-capacity tests on a.c. fuses		P
8.5.5.1	Table 20, test No. 1 for "g" and "a" fuse-links	For 16A	P
	Rated breaking capacity of the fuse-links (kA), at voltage (V)	120kA,500VAC	-
	Rated current (A) of the fuse-links	16A	P
	Prospective current I_1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%	120kA	P
	Power factor	0,20	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Initiation of arcing after voltage zero: within 40° - 65° for sample 1 and within 65° - 90° for sample 2 and 3, or	1) 49,2 2) 66,3 3) 85,3	P
	for sample 1) arcing after voltage zero within 0° + 10°, - 0°		N/A
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568V 2) 568V 3) 568V	P
	Cut-off current (A)	1) 3,7kA 2) 3,8kA 3) 3,7kA	P
8.5.8	Acceptability of No. 1 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	918,6V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 15 2) 25 3) 15	P
8.5.5.1	Table 20, test No. 1 for "g" and "a" fuse-links	For 160A	P
	Rated breaking capacity of the fuse-links (kA), at voltage (V)	120kA,500VAC	-
	Rated current (A) of the fuse-links	160A	P
	Prospective current I1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%	120kA	P
	Power factor	0,20	P
	Initiation of arcing after voltage zero: within 40° - 65° for sample 1 and within 65° - 90° for sample 2 and 3, or	1) 58,8 2) 86,7 3) 89,3	P

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Clause	Requirement + Test	Result - Remark	Verdict
	for sample 1) arcing after voltage zero within 0° + 10°, - 0°		N/A
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568V 2) 568V 3) 568V	P
	Cut-off current (A)	1)12,6kA 2) 14,5kA 3) 15,3kA	P
8.5.8	Acceptability of No. 1 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	914,3V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 25 2) 7 3) 20	P
8.5.5.1	Table 20, test No. 2 for "g" and "a" fuse-links		P
	Prospective current I ₂ (kA)	11,88kA	P
	Test made under conditions which approximate those giving maximum arc energy		P
	Power factor	0,27	P
	Making angle after voltage zero: within tolerance 0° + 20°, - 0°	1) 8,6 2) 5,6 3) 8,7	P
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568 2) 568 3) 568	P
	Recovery voltage maintained at a value (V); duration (s) for sample (No.)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	For other samples duration 15 s (8.5.5.2)		P
8.5.8	Acceptability of No. 2 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	1035V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 500 2) 300 3) 500	P
8.5.5.1	Table 20, test No. 2* for "g" and "a" fuse-links, for $I_2 \geq I_1$	(see appended table)	N/A
	Prospective current I_2 (kA) for test No. 2 greater than the rated breaking capacity (kA)		N/A
	Test made on six samples replacing tests of Nos. 1 and 2. Test made with current I_1 (kA)		N/A
	Making angels differ approximately 30° between each test		N/A
	Power factor		N/A
8.5.8	Acceptability of No. 2 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.5.1	Table 20, test No. 3 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_3 (A) equal to $3,2 I_f$	820A	P
	Prospective current for "a" fuse-link I_3 (A) equal to $2,5 k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current $\pm 20\%$		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2)		P
8.5.8	Acceptability of No. 3 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 14 2) 3)	P
8.5.5.1	Table 20, test No. 4 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_4 (A) equal to $2,0 I_f$	520A	P
	Prospective current for "a" fuse-link I_4 (A) equal to $1,6 k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current + 20%, - 0%		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2) :		P
8.5.8	Acceptability of No. 4 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P

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Clause	Requirement + Test	Result - Remark	Verdict
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 7 2) 3)	P
8.5.5.1	Table 20, test No. 5 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_5 (A) equal to $1,25 I_f$	320A	P
	Prospective current for "a" fuse-link I_5 (A) equal to $k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current + 20%, - 0%		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2) :		P
8.5.8	Acceptability of No. 5 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 20 2) 3)	P
	Breaking-capacity tests on d.c. fuses		N/A
8.5.5.1	Table 21, d.c.test No. 1 for "g" and "a" fuse-links		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated breaking d.c. capacity of the fuse-links (kA), at voltage (V)		—
	Rated current (A) of the fuse-links		N/A
	Rated voltage (V) of the fuse-links		N/A
	Prospective current I_1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	—
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 1 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 2 for "g" and "a" fuse-links		N/A
	a) During test No. 1 arcing commences at a current $\geq 0,5 I_1$, test No. 2 was not performed		N/A
	b) Prospective current I_2 (A). Test made under conditions which approximate those giving maximum arc energy		N/A
	Time constant (ms) between 15 to 20 ms		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Arcing commences at current (A) :	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 2 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6) :		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 3 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A) :		-
	Prospective current I ₃ (A) equal to 3,2 I _f :		N/A
	Tolerance on current (%) ± 20% :		N/A
	Time constant (ms) between 15 to 20 ms :		N/A
	Arcing commences at current (A) :	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 3 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6) :		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 4 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A) :		—
	Prospective current I_4 (A) equal to $2,0 I_f$:		N/A
	Tolerance on current (%) + 20%, - 0% :		N/A
	Time constant (ms) between 15 to 20 ms :		N/A
	Arcing commences at current (A) :	1) 2) 3)	—
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 4 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6) :		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.5.5.1	Table 21, d.c.test No. 5 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A)		—
	Prospective current I_s (A) equal to $1,25 I_f$		N/A
	Tolerance on current (%) + 20%, - 0%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	
	Value of recovery voltage: voltage (V) within tolerances $115 + 5\%$, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 5 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.6	Verification of the cut-off current characteristics		P
8.6.2	The values measured did not exceed cut-off characteristics indicated by the manufacturer (see 5.8.1)		P
8.7	Verification of I^2t characteristics and overcurrent discrimination		P
8.7.2	The operating I^2t values measured not exceed the values indicated by the manufacturer, or		P
	those specified in subsequent parts		P
	The pre-arcing I^2t values not less than minimum pre-arcing values given by the manufacturer, or		N/A

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	they lie within the limits indicated in Table 7		P
8.7.3	Verification of compliance for fuse-links at 0,01 s		P
	"gG" and "gM" fuse-links at 0,01 s comply with Table 7		P
8.7.4	Verification of overcurrent discrimination		P
	The discrimination of the fuse-links verified by means of the time-current characteristics and the pre-arcing and operating I^2t values		P
8.8	Verification of the degree of protection of enclosures		P
	Degree of protection IP : IP00		P
	Verification by test under conditions specified in IEC 60529 :		P
8.9	Verification of resistance to heat		P
	No damage impaired by heat during the previous tests (in particular with respect to 8.3, 8.4, 8.5 and 8.10)		P
8.10	Verification of non-deterioration of contacts		P
8.10.1	Three samples provided with standardized dummy fuse-links of the highest current rating (A) intended to be used in the fuse-holder (see subsequent parts) :		P
8.10.2	Test current (A) for load period : 200A		P
	Duration (s) of load period : 0,5h		P
	Duration (s) of no-load period : 0,2h		P
	a) Test of 250 cycles, measured values not exceed the limits given in subsequent parts		P
	b) Test of 750 cycles, measured values not exceed the limits given in subsequent parts		P
8.11	Mechanical and miscellaneous tests		P
8.11.1	Mechanical strength		P
	Mechanical characteristics of fuse and its parts judged in the context of normal handling and mounting as well as with results shown after breaking-capacity test (see 8.5), if not otherwise specified in the subsequent parts		P
8.11.2	Miscellaneous tests		P
8.11.2.1	Verification of freedom from season cracking		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Current-carrying parts made of rolled copper alloy with less than 83% copper content and with all grease removed, placed for 4 h in test cabinet having temperature of $(30 \pm 10) ^\circ\text{C}$		P
	After this, samples placed for 8 h in test cabinet, on the bottom of which is ammonium chloride solution having pH value 10 - 11		P
	After test no cracks visible to the unaided eye		P
8.11.2.2	Verification of resistance to abnormal heat and fire		P
8.11.2.2.1	Parts of insulating material, except ceramic, have a limited duration of burning without spreading fire by flames or burning droplets or glowing particles falling from the specimen		P
8.11.2.2.5	Glow-wire test: $(650 \pm 10) ^\circ\text{C}$		N/A
	Parts of insulating materials not necessary to retain current-carrying parts in position even though they are in contact with them, made the glow-wire test $(650 \pm 10) ^\circ\text{C}$		N/A
	No visible flame, or burning or glowing of the specimen extinguish within max. (s) after removal of the glow-wire. Limit $(30 \pm 1) \text{ s}$		N/A
	No burning of the tissue paper		N/A
	No scorching of the pinewood board		N/A
	Glow-wire test: $(960 \pm 10) ^\circ\text{C}$	No flame	P
	Parts of insulating materials necessary to retain current-carrying parts and parts of the earthing circuit, if any, in position, made the glow-wire test $(960 \pm 10) ^\circ\text{C}$		P
	No visible flame, or burning or glowing of the specimen extinguish within max. (s) after removal of the glow-wire. Limit $(30 \pm 1) \text{ s}$		P
	No burning of the tissue paper		P
	No scorching of the pinewood board		P
8.11.2.3	Verification of resistance to rusting		P
	Tested parts after degreasing (10 min in specified solution) placed for 10 min in air saturated with moisture and after that dried 10 min in an ambient temperature $(100 \pm 5) ^\circ\text{C}$		P
	Surface of tested parts show no signs of rust		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict

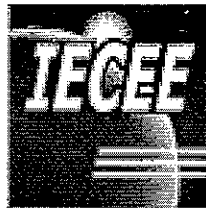
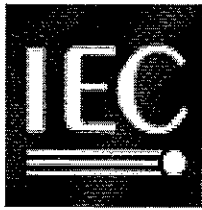
APPENDIX 1

8.1.5.1	TABLE: Internal resistance of the fuse-links											P
	a) rated current (A) of the fuse-link :										16	—
	measuring current (A) :										1,6	—
	ambient air temperature (°C) :										25	—
internal resistance	sample No.											
	1	2	3	4	5	6	7	8	9	10	11	12
R (mΩ)	6,813	7,250	7,188	6,750	7,563	7,688	7,375	7,188	7,313	7,625	7,938	7,500
	b) rated current (A) of the fuse-link :										20	—
	measuring current (A) :										2	—
	ambient air temperature (°C) :										25	—
internal resistance	sample No.											
	1	2	3	4	5							
R (mΩ)	4,550	4,650	5,550	4,850	4,950							
	c) rated current (A) of the fuse-link :										25	—
	measuring current (A) :										2,5	—
	ambient air temperature (°C) :										25	—
internal resistance	sample No.											
	1	2	3	4	5	6						
R (mΩ)	3,320	3,480	3,520	3,440	3,640	3,680						
	c) rated current (A) of the fuse-link :										32	—
	measuring current (A) :										3,2	—
	ambient air temperature (°C) :										25	—
internal resistance	sample No.											
	1	2	3	4	5							
R (mΩ)	2,531	2,594	2,656	2,625	2,750							
	c) rated current (A) of the fuse-link :										40	—
	measuring current (A) :										4	—
	ambient air temperature (°C) :										25	—
internal resistance	sample No.											
	1	2	3	4	5							
R (mΩ)	1,725	1,775	1,800	1,725	1,750							
	c) rated current (A) of the fuse-link :										50	—
	measuring current (A) :										5	—
	ambient air temperature (°C) :										25	—
internal resistance	sample No.											
	1	2	3	4	5							

IEC 60269-1														
Clause	Requirement + Test											Result - Remark	Verdict	
R (mΩ)	1,400	1,380	1,460	1,480	1,420									
	c) rated current (A) of the fuse-link											:	63	—
	measuring current (A)											:	6,3	—
	ambient air temperature (°C)											:	25	—
internal resistance	sample No.													
	1	2	3	4	5	6								
R (mΩ)	1,206	1,222	1,254	1,302	1,286	1,317								
	c) rated current (A) of the fuse-link											:	80	—
	measuring current (A)											:	8	—
	ambient air temperature (°C)											:	25	—
internal resistance	sample No.													
	1	2	3	4	5	6								
R (mΩ)	0,750	0,788	0,763	0,813	0,763	0,775								
	c) rated current (A) of the fuse-link											:	100	—
	measuring current (A)											:	10	—
	ambient air temperature (°C)											:	25	—
internal resistance	sample No.													
	1	2	3	4	5									
R (mΩ)	0,620	0,610	0,630	0,610	0,620									
	c) rated current (A) of the fuse-link											:	125	—
	measuring current (A)											:	12,5	—
	ambient air temperature (°C)											:	25	—
internal resistance	sample No.													
	1	2	3	4	5									
R (mΩ)	0,464	0,456	0,472	0,480	0,488									
	c) rated current (A) of the fuse-link											:	160	—
	measuring current (A)											:	16	—
	ambient air temperature (°C)											:	25	—
internal resistance	sample No.													
	1	2	3	4	5	6	7	8	9	10	11	12		
R (mΩ)	0,306	0,319	0,325	0,344	0,325	0,331	0,313	0,331	0,325	0,344	0,306	0,338		
internal resistance	sample No.													
	13	14	15	16	17	18	19							
R (mΩ)	0,319	0,313	0,350	0,338	0,306	0,319	0,331							

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.5.5.1	TABLE: Table 20, test No. 2* for "g" and "a" fuse-links, for $I_2 \geq I_1$				N/A
sample No.	making angle after voltage zero	recovery voltage		cut off current	resistance between contacts
	(°)	(V)	(%)	(A)	(MΩ)
1					
2					
3					
4					
5					
6					



Test Report issued under the responsibility of:



TEST REPORT IEC 60269-2 Low-voltage fuses Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to I	
Report Reference No.....	15032525 001 Part II
Date of issue.....	30.07.2009
Total number of pages.....	18 pages
Testing Laboratory	TÜV Rheinland (Shanghai) Co., Ltd.
Address.....	10-15/F, Huatsing Building, No.88, Lane 777, Guangzhong Road West, 200072 Shanghai Zhabei District, P.R. China
Applicant's name	Wenzhou Jinlida Electrical Co., Ltd.
Address.....	Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604 P.R. China
Test specification:	
Standard	IEC 60269 - 2 : 2006 (third edition) (see also IEC 60269 – 1:1998)
Test procedure.....	CB
Non-standard test method.....	N/A
Test Report Form No.....	IEC60269_2A
Test Report Form(s) Originator	EZU
Master TRF.....	Dated 2007-12
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Test item description.....	Fuses(fuse link and fuse base)
Trade Mark	JINLIDA
Manufacturer.....	Same as applicant
Model/Type reference.....	NH00
Ratings.....	AC 500V; 16A,20A,25A,32A,40A,50A,63A,80A,100A,125A,160A; 120kA; Size 00

Testing procedure and testing location:	
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address.....:	TÜV Rheinland (Shanghai) Co., Ltd. Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
<input type="checkbox"/> Associated CB Test Laboratory: Testing location/ address.....: Tested by (name + signature).....: Approved by (+ signature):	
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature): Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature).....: Approved by (+ signature): Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address.....:	

Summary of testing:	
Tests performed (name of test and test clause): For homogeneous series of NH00, type tests are listed in table 11, 12, 13 and 14 in EN 60269-1:2006	Testing location: Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
Summary of compliance with National Differences: N/A	

Copy of marking plate:

Refer to 15032525 001 part I.

Test item particulars	
Classification of installation and use	See part I
Supply Connection	See part I
Fuse system	A /B/C/D/E/F/G/H/I
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	06.2009
Date (s) of performance of tests	06.2009-07.2009
General remarks:	
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. "(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:	
N/A	

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
Requirements IEC 60269-1			
FUSE SYSTEM A – FUSES WITH FUSE-LINKS WITH BLADE CONTACTS (NH FUSE SYSTEM)			
5	CHARACTERISTICS OF FUSES		
5.2	Rated voltage (V) as specified	500VAC	P
5.3.1	Rated current (A) of the fuse-link in accordance with specified values		P
5.3.2	Rated current (A) of the fuse-holder and the size of the fuse-link	Size 00	P
5.5	Rated power (W) dissipation of fuse-link see Figure 101	<12W	P
	Rated acceptable power (VA) dissipation of fuse-bases given in Figure 102	12W	P
5.6	Limits of time-current characteristics		P
5.6.1	Time-current characteristics, time-current zones and overload curves		P
5.6.2	Conventional times and current see Table 101		P
5.6.3	Gates		P
5.7.2	Rated breaking capacity (A)	120kA	P
6	MARKING		
	Markings are legible		P
6.1	Fuse-holders marked by:		P
	- IEC 60269-2		P
	- size	00	P
	Marking of rated current and rated voltage are discernible from the front		P
6.2	Fuse-links marked by:		P
	- IEC 60269-2		P
	- size or reference	00	P
	- rated breaking capacity	120kA	P
	Marking of rated current and rated voltage are discernible from the front		P
	Fuse-links are marked as described in Table 104.. :		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
7	STANDARD CONDITIONS FOR CONSTRUCTION		
7.1	Mechanical design		P
	The dimensions of the fuse-links given in Figure 101		P
	Dimensions:		P
	dimension marking a1: prescribed (mm); measured (mm)	78,5±1,5;	P
	dimension marking a2: prescribed (mm); measured (mm)	54-6;	P
	dimension marking a3: prescribed (mm); measured (mm)	45±1,5;	P
	dimension marking a4: prescribed (mm); measured (mm)	49±1,5;	P
	dimension marking b1min: prescribed (mm); measured (mm)	15;	P
	dimension marking b2min: prescribed (mm); measured (mm)	4,5;	P
	dimension marking b3max: prescribed (mm); measured (mm)	5;	P
	dimension marking b4min: prescribed (mm); measured (mm)	12;	P
	dimension marking c1: prescribed (mm); measured (mm)	35;	P
	dimension marking c2: prescribed (mm); measured (mm)	10-1;	P
	dimension marking d: prescribed (mm); measured (mm)	2+1,5/-0,5	P
	dimension marking e1max: prescribed (mm); measured (mm)	48;	P
	dimension marking e2max: prescribed (mm); measured (mm)	30;	P
	dimension marking e3: prescribed (mm); measured (mm)	20±5;	P
	dimension marking e4: prescribed (mm); measured (mm)	6;	P
	dimension marking f: prescribed (mm); measured (mm)	15;	P
	dimension marking z: prescribed (mm); measured (mm)	3;	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The dimensions of the fuse-base given in Figure 102		P
	Dimensions:		P
	dimension marking g: prescribed (mm); measured (mm)	47 ± 1;	P
	dimension marking h: prescribed (mm); measured (mm)	100 ± 1,5;	P
	dimension marking n1max: prescribed (mm); measured (mm)	30;	P
	dimension marking n2max: prescribed (mm); measured (mm)	38;	P
	dimension marking p1max: prescribed (mm); measured (mm)	40;	P
	dimension marking p2: prescribed (mm); measured (mm)		N/A
	dimension marking r min: prescribed (mm); measured (mm)	17	P
	dimension marking s max: prescribed (mm); measured (mm)	21	P
	dimension marking t min: prescribed (mm); measured (mm)	15	P
	dimension marking v: prescribed (mm); measured (mm)	56,5+1,5	P
	dimension marking w1: prescribed (mm); measured (mm)	0 ± 0,7;	P
	dimension marking w2: prescribed (mm); measured (mm)	25 ± 0,7;	P
	dimension marking x min: prescribed (mm); measured (mm)	14;	P
	dimension marking y: prescribed (mm); measured (mm)	7,5 ± 0,5;	P
	dimension marking z max: prescribed (mm); measured (mm)	3	P
7.1.2	Connections, including terminals cross-sectional ranges (Table 105) torques to be applied (Table 111) (lug terminal)		P
7.1.3	Contact surfaces should be silver plated	Yes / No	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If no test according to 8.10 are passed with dummies described in 8.10.1		P
7.1.5	Dynamic short-circuit withstand shall meet cut-off currents (Table 112)		P
7.1.7	Construction of fuse-link		P
	Blade contacts made of solid material		P
	If any other construction, manufacturer demonstrate that construction adequate		N/A
	Endplates not permitted to protrude radially from insulation body		P
	preferable to insulate the gripping lugs from live parts		P
	Fuse-links has an indicator		P
	Electrically conductive parts of indicator not ejected from the fuse-link during operation		P
7.2	Insulating properties		P
	Creepage distances and clearances of fuses and fuse-accessories meet requirements of IEC 60664-1 for overvoltage category III and pollution degree 3..:		P
7.7	I^2t characteristics		P
	maximum pre-arcing I^2t (Table 7 of IEC 60269-1)		P
	rated currents lower than 16 A (Table 106)		N/A
	maximum operating I^2t for "aM" fuse-links (Table 107) test No. 2 of the largest rated current of each homogeneous series (Table 20 of IEC 60269-1)		N/A
7.8	Overcurrent discrimination of "gG" fuse-links (see 8.7.4, Table 108)		P
7.9	Protection against electric shock		P
	increased by means of partition walls and covers of fuse-contacts		P
	operation by authorized persons, instructed in electrical matters, using replacement handles according to this fuse system		P

IEC 60269-2				
Clause	Requirement + Test		Result - Remark	Verdict
8	TESTS			
	IEC 60269-1 applies with the following supplementary requirements			P
8.1.4	Arrangement of fuse and dimensions			P
	Requirements of 7.2 verified on fuse-bases			P
	Creepage distances and clearances of fuse-links according to 7.2 are verified			P
	Clearances verified on fuse-link inserted into model fuse-base according to Figure 111.....			P
8.1.6	Testing of fuse-holders			P
	In addition to test given in IEC 60269-1 tested according to Table 109			P
8.2.2.1	Points of application of test voltage			P
	In addition to IEC 60269-1 e) between isolated metal gripping-lugs and terminals of test fuse-bases		1890V	P
8.2.3.2	Value of test voltage		Not applicable	N/A
	rated impulse withstand voltage in Table 110			N/A
8.2.3.3	Test method			N/A
	5 impulses of both polarities and of shape 1,2/50 μ s and rated withstand voltage level according to Table 110			N/A
	minimum period between impulses are 1 s			
8.2.4	Acceptability of test results			P
8.2.4.3	No flash-over or puncture shall occur during test ...			P
8.2.5	Resistance to tracking			P
	plastic parts of fuse-links and fuse-bases tested and shall pass at PTI level stated by manufacturer		500M	P
8.3	Verification of temperature rise and power dissipation			P
8.3.1	Arrangement of the fuse			P
	Tightened by torque (Nm)		10	—
8.3.2	Measurement of the temperature rise			P
	Protective covers and fuse-carriers as provided by manufacturer mounted			P
8.3.4.1	Temperature rise of the fuse-holder		See part I	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Dummy (Figure 105) Point at which temperature rise is measured (Figure 106)		P
8.3.4.2	Power dissipation of a fuse-link (Figure 106)	10,3W	P
8.4.3.1	Verification of conventional non-fusing and fusing current	See part I	P
	non-fusing current test – second test specimen are used for b)	See part I	P
8.4.3.5	Conventional cable overload protection test (for “gG” fuse-links only)	See part I	P
	Details of special test are given in Annex A	Not required	N/A
Annex A	Special test for cable overload protection		N/A
	For fuses with $I_n > 16$ A of the sizes 00, 0, 1 and 2. :		N/A
A.1	Arrangement of the fuse		N/A
	Three fuse-links in fuse-bases mounted in a box... :		N/A
	Ambient air temperature outside the fuse box shall be $(30^{+5}_0^{\circ}\text{C})$	°C	N/A
A.2	Test method and acceptability of test results		N/A
	$1,13 I_n$ flowed through the fuse-links for conventional time (see Table 2 of IEC 60269-1)	A for s	N/A
	Non of fuse-links operated		N/A
	Test current raised without interruption within 5 s to $1,45 I_n$	A	N/A
	One fuse-link operated within conventional time :		N/A
8.5.5.1	Verification of the peak withstand current of a fuse-base	Not applicable	N/A
	not be carried out , if this has already been verified during the breaking capacity test of fuse-links with the highest rating of the size		N/A
8.5.5.1.1	Arrangement of the fuse		N/A
	single-phase type, 8.5.1 of IEC 60269-1 peak values of the test currents (Table 112) : maximum values (see 8.5.5.1.3)..... : dummy fuse-link (Figure 101)		N/A
8.5.5.1.2	Test method		N/A

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	fuse-base 1 (Figure107) resilient spring travel is limited to elastic range..... : contacts opened up three times		N/A
	fuse-base 2 (see 8.11.1.2) F_{max} according to Table 118		N/A
8.5.5.1.3	Acceptability of test results		N/A
	fuse-links not be ejected		N/A
	no signs of arcing or welding or other damage		N/A
8.5.8	Acceptability of test results		N/A
	Fuse or circuit-breaker not operate during this test		N/A
8.7.4	Verification of overcurrent discrimination		P
	verified by I^2t values evaluated from the recorded test results		P
	Arrangement of the samples as for the breaking capacity test		P
	two samples tested at the r.m.s. prospective test current I , corresponding to minimum pre-arcing I^2t	1) 2)	P
	the other samples tested at the r.m.s. prospective test current I , corresponding to operating I^2t	3) 4)	P
	test voltage (V)		—
	The values of I^2t lie within corresponding limits specified in Table 113.....		P
8.9	Verification of resistance to heat		P
	Tests apply to fuse-link and fuse-base		P
	Fuse-holder with fuse-links having maximum power dissipation are cyclically loaded as pre-treatment... :		P
	After cooling to normal temperature breaking capacity tested at I_1 (see 8.5)..... :	$I_1 = 120kA$	P
	Fuse-links with organic material Fuse-holder with fuse-links having maximum power dissipation are cyclically loaded as pre-treatment...		N/A
	After cooling to normal temperature breaking capacity tested at I_1 and I_5 (see 8.5)..... :	$I_1 =$ $I_5 =$	N/A
8.9.1	Fuse-base		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	test below apply if it is not obvious that components are not affected adversely by given temperature and withdrawal forces		P
8.9.1.1	Test arrangement		P
	Figure 105 and 108		P
	Test se-up in heating chamber		P
8.9.1.2	Test method		P
	Temperature of (80 ⁺⁵ ₀)°C for 2 h		P
	160% rated current for 2 h..... :	160% I _n =256A	P
	Test voltage :	50 V	
	3 min after switching off tensile force F _{max} (see Table 118) exerted for 15 s	F _{max} =	P
8.9.1.3	Acceptability of test results		P
	Contact pieces not have moved to affect the further use		P
	Dimensions of Figure 102 are considered		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.9.2	Fuse-links with gripping lugs of moulded material or of metal fixed in moulded material	No such part	N/A
8.9.2.1	Test arrangement		N/A
	Figure 108		N/A
8.9.2.2	Test method		N/A
	Temperature of (80 ⁺⁵ ₀)°C for 2 h		N/A
	150% rated current for conventional time :	A for h	N/A
	Test voltage :	V	
	3 min after fuse-link operated or conventional time expired tensile force F _{max} (see Table 118) exerted for 15 s	F _{max} =	N/A
8.9.2.3	Acceptability of test results		N/A
	Gripping lugs remain fully operational		N/A
	Dimensions of Figure 101 (d and c ₂) not be exceeded by more than 2 mm		N/A
8.10	Verification of non-deterioration of contacts and direct terminal clamps		P

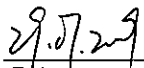
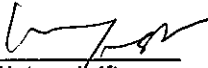

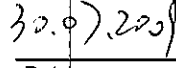
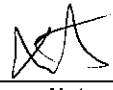

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.10.1	Arrangement of the fuse		P
	Figure 105		P
	for lug terminals, torque in Table 111..... :	10 Nm	—
	Insulation of conductors removed over the whole length		P
8.10.1.2	Direct terminal clamps		P
	Test performed on 10 direct terminal clamps of five fuse-bases		P
	Distance between fuse-base centres of at least three times e_2 (see Figure 101)		P
	Torque of tightened of screws	Nm	—
	Conductor cross-section	mm ²	—
8.10.2	Test method		P
	Test current (A) for load period	200A	P
	Duration (s) of load period	0,5h	P
	Duration (s) of no-load period	0,2h	P
	Test voltage (V)	50V	—
	a) Test of 50 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	b) Test of 250 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	c) Test of 500 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	d) Test of 750 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
8.10.2.1	Contacts		P
	Points between voltage drop is measured (A and B in Figure 106)		P
	Withdrawal force (Table 118); measured force after 250 cycles (N)	1) 2) 3)	P

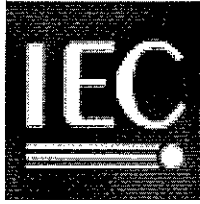
IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Withdrawal force (Table 118); measured force after 750 cycles (N)	1) 2) 3)	P
	If measured values too low, test of 8.5.5.1		N/A
8.10.2.2	Direct terminal clamps		P
	Points between voltage drop is measured (Figure 110)		P
	Test sequence for all types conductors (see Table 116)		P
	Verification of temperature rise (see 8.3.4.1) (see figure 110).....		P
8.10.3	Acceptability of test results		P
8.10.3.1	Contacts		P
	Limit value after 250 th cycle $\leq 15\%$		P
	Limit value after 500 th cycle $\leq 30\%$		P
	Limit value after 750 th cycle $\leq 40\%$		P
	Difference between last and first measurement of temperature rise less than 20 K		P
8.10.3.2	Direct terminal clamps		P
	Permissible tolerance for resistance R_{cl0} for Al conductors : $R_{cl0\ max} \leq 2 R_{cl0\ min}$		P
	Permissible changes of the resistance from R_{cl50} to R_{cl750} : see Table 117		P
	Copper or cleaned aluminium conductors		P
	Uncleaned aluminium conductors		N/A
	Change from 50 th to 250 th cycle		P
	Change after 250 th to 500 th cycle		P
	Change after 500 th to 750 th cycle		P
	Change between 50 th to 750 th cycle		P
	Temperature rise at test spot F < 75K		P
8.11	Mechanical and miscellaneous tests		P
8.11.1.1	Mechanical strength of fuse-holders		P
	Test set-up subjected to temperature rise test at rated current	160A	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	fuse-link or fuse-carrier are withdrawn and inserted into fuse-base 100 times	100 times	—
	All parts are intact and function normally		P
	Test set-up subjected to further temperature rise test at rated current (values obtained are not more than 5 K or 15 % above the values from temperature-rise test prior)	Max. 39K	P
8.11.1.2	Mechanical strength of the fuse-base		P
	Test-link inserted three times in the fuse-base : (Dimensions of blade contacts see Figure 101) (Withdrawal force F lied within limits in Table 118)		P
	Steel screws are fastened three times at the terminals, torque of 1,2 times value specified by manufacturer or value of Table 111		P
	Contact pieces not have moved to affect the further use		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.11.1.8	Impact resistance of gripping-lugs of moulded material or of metal fixed in moulded material		N/A
8.11.1.8.1	Test arrangement		N/A
8.11.1.8.2	Facility is given in Figure 109		N/A
	One fuse-link ... $(150 \pm 5)^{\circ}\text{C}$ for 168 h		—
	Another one -15°C for 72 h		—
	One impact on each of gripping-lugs		N/A
8.11.1.8.3	Acceptability of test results		N/A
	No damage capable of hindering their further use		N/A
	No bent out by more than 3 mm		N/A
	Coupling with a handle (Figure 103) not are hindered		N/A
8.11.2.3	Verification of resistance to rusting		N/A
8.11.2.3.1	According to ISO 6988 cyclic moist atmosphere containing 0,2% SO ₂ (SFW 0,2 S) for 1 cycle		N/A
8.11.2.3.2	Optional test (severe environmental conditions)		N/A

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse-links and fuse-bases for used in environment of pollution degree ≥ 3 tested with SFW 2,0 S for 5 cycles		N/A
	They marked accordingly		N/A
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base		P
8.11.2.4.1	Test method		P
	Period 168 h	168	
	for equipment comprising moulded elements to support live parts (150 \pm 5) $^{\circ}$ C	150	
	for covers (100 \pm 5) $^{\circ}$ C		
	Period greater than 1 h	1h	
	for sealing compounds; stability of marking(150 \pm 5) $^{\circ}$ C		
	After cooling to ambient temperature the following are tested.		P
	Fuse-links: breaking capacity with I_1 and I_2		P
	Fuse-base: mechanical strength in accordance with 8.11.1.2		P
8.11.1.2	Mechanical strength of the fuse-base		P
	Test-link inserted three times in the fuse-base : (Dimensions of blade contacts see Figure 101) (Withdrawal force F lied within limits in Table 118)		P
	Steel screws are fastened three times at the terminals, torque of 1,2 times value specified by manufacturer or value of Table 111		P
	Contact pieces not have moved to affect the further use		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.11.2.4.2	Acceptability of test results		P
	Not have changed of positions of fuse-base contacts to correct functioning		P
	No fracture nor any signs of fracture on insulating body with terminals		P
	Mechanical strength of cemented joints not impaired		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sealing compounds not shifted to extent permitting live parts to exposed		P
	Fuse-links operate correctly		P
	Marking are durable and easily legible		P

Prüfbericht - Nr.: 15033141 001 <i>Test Report No.:</i>		Seite 1 von 1 Page 1 of 1	
Auftraggeber: <i>Client:</i>		Wenzhou Jinlida Electrical Co., Ltd. Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604, P.R. China	
Gegenstand der Prüfung: <i>Test item:</i>		Low-voltage Fuse	
Bezeichnung: <i>Identification:</i>		Serien-Nr.: <i>Serial No.:</i>	Engineering sample
NH1			
Wareneingangs-Nr.: <i>Receipt No.:</i>		Eingangsdatum: <i>Date of receipt:</i>	153123295 22.06.2009
153123295			
Prüfart: <i>Testing location:</i>		Hunan Electrical Equipment Testing & Inspection Institute No. 4 Xinzhong Road, Changsha, Hunan, P.R. China	
Prüfgrundlage: <i>Test specification:</i>		IEC 60269-1:2006 IEC 60269-2:2006	
Prüfresultat: <i>Test Result:</i>		Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). The test item passed the test specification(s).	
Prüflaboratorium: <i>Testing Laboratory:</i>		TÜV Rheinland (Shanghai) Co., Ltd.	
geprüft/ tested by:		kontrolliert/ reviewed by:	
 Datum: 29.07.2009 Name/Stellung: Kenny Shi/PE Unterschrift:  Date: 29.07.2009 Name/Position: Kenny Shi/PE Signature: 		 Datum: 30.07.2009 Name/Stellung: Bo Xia/Reviewer Unterschrift:  Date: 30.07.2009 Name/Position: Bo Xia/Reviewer Signature: 	
Sonstiges/ Other Aspects:			
This report consists of two parts: Part I for IEC 60269-1:2006. Part II for IEC 60269-2:2006.			
Abkürzungen:		Abbreviations:	
P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet		P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			



Test Report issued under the responsibility of:






TEST REPORT IEC 60269-1 Low-voltage fuses Part 1: General requirements	
Report Reference No.....	15033141 001 Part I
Date of issue	30.07.2009
Total number of pages	43 pages
Testing Laboratory.....	TÜV Rheinland (Shanghai) Co., Ltd.
Address	10-15/F, Huatsing Building, No.88, Lane 777, Guangzhong Road West, 200072 Shanghai Zhabei District, P.R. China
Applicant's name.....	Wenzhou Jinlida Electrical Co., Ltd.
Address	Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604 P.R. China
Test specification:	
Standard.....	IEC 60269-1:2006 (Fourth edition)
Test procedure	CB
Non-standard test method.....	N/A
Test Report Form No.	IEC60269_1A
Test Report Form(s) Originator	EZU
Master TRF	Dated 2009-04
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Test item description	Fuses (fuse-link and fuse-base)
Trade Mark	JINLIDA
Manufacturer	Same as applicant
Model/Type reference	NH1
Ratings	AC 500V; 80A,100A,125A,160A,200A,224A,250A; 120kA; Size 1

Testing procedure and testing location:	
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address.....:	TÜV Rheinland (Shanghai) Co., Ltd. Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
<input type="checkbox"/> Associated CB Test Laboratory: Testing location/ address.....: Tested by (name + signature).....: Approved by (+ signature):	
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature): Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature).....: Approved by (+ signature): Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address.....:	

Summary of testing:	
Tests performed (name of test and test clause): For homogeneous series of NH1, type tests are listed in table 11, 12, 13 and 14 in EN 60269-1:2006	Testing location: Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
Summary of compliance with National Differences: N/A	

Copy of marking plate:

JINLIDA
NH1
500V~120kA
690V~50kA
gG 250A
IEC 60269
  

Marking plate of fuse-link

JINLIDA
NH1
500V~250A
690V~200A
IEC 60269

Marking plate of fuse-base

Test item particulars	
Fuse-holder	Yes/No
Fuse-base	Yes/No
Fuse-carrier	Yes/No
Fuse-link	Yes/No
Fuse for use by authorized persons	Yes/No
Fuse for use by unskilled persons	Yes/No
.....	
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	06.2009
Date (s) of performance of tests	06.2009-07.2009
General remarks:	
<p>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. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>	
General product information:	
N/A	

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	CHARACTERISTICS OF FUSES		
5.2	Rated voltage (V) as specified	AC 500V	P
5.3.1	Rated current (A) of the fuse-link in accordance with specified values	80A,100A,125A,160A,200A,224A,250A	P
5.3.2	Rated current (A) of the fuse-holder	250A	P
5.4	Rated frequency (Hz)	50Hz	P
5.5	Max. rated power dissipation (VA) of fuse-link	<=23W	P
	Rated acceptable power dissipation (VA) of fuse-holder	32W	P
5.6	Limits of time-current characteristics based on reference ambient air temperature Ta of +20°C		P
5.6.1	Time-current zones deviated from standardized, or available in manufacturers documentation (with tolerances)		P
5.6.2	Conventional times and currents see Table 2		P
5.6.3	Gates		P
5.7	Breaking range and breaking capacity	120kA	P
5.7.1	Breaking range and utilization category	gG	P
5.7.2	Rated breaking capacity (A) of fuse-link corresponds to the rated voltage (V), and is equal or higher than given minimum (A) in subsequent part of this standard	120kA	P
5.8	Cut-off current and I ² t characteristics are referred to the values of voltage, frequency and power factor		P
5.8.1	Cut-off current characteristics, if required, given by the manufacturer according to Figure 4		P
5.8.2	Pre-arcing I ² t characteristics for pre-arcing times of less than 0,1 s down to a time corresponding to the rated breaking capacity given by the manufacturer :		P
	The operating I ² t characteristics with specified voltages as parameter for pre-arcing times less than 0,1 s given by the manufacturer		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
6	MARKINGS		
	Markings are durable and easily legible		P
6.1	Fuse-holders marked by:		P
	- name of manufacturer or trade mark which enable identification of fuse-holder	JINLIDA	P
	- manufacturer's identification reference enabling to find all characteristics listed in 5.1.1	NH1	P
	- rated voltage (V)	500V	P
	- rated current (A)	250A	P
	- kind of current and rated frequency (Hz)	AC and 50Hz	P
6.2	Fuse-link(s) except small fuse-link(s) marked by:		P
	- name of manufacturer or trade mark which enable identification of fuse-links	JINLIDA	P
	- manufacturer's identification reference enabling to find all characteristics listed in 5.1.2	NH1	P
	- rated voltage (V)	500V	P
	- rated current (A)	80~250A	P
	- breaking range and utilization category (if applicable) (5.7.1)	gG	P
	- kind of current	AC	P
	- rated frequency (Hz), if applicable (5.4)	50Hz	P
	Small fuse-links marked by:		N/A
	- trademark		N/A
	- list reference of manufacturer		N/A
	- rated voltage (V)		N/A
	- rated current (A)		N/A
6.3	Symbols for the kind of current and frequency in accordance with IEC 60417		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
7	STANDARD CONDITIONS FOR CONSTRUCTION		
7.1	Mechanical design		P
7.1.1	Replacement of fuse-links easily and safely		P
7.1.2	Connections, including terminals		P
	Contact force is not transmitted through insulating material other than ceramic or other material with characteristics not less suitable, unless		P
	there is sufficient resilience in the metallic parts to compensate any possible shrinkage or other deformation of the insulating material		P
	Terminals cannot turn or be displaced when the connecting screws are tightened		P
	Terminals shall be such, that the conductors cannot be displaced		P
	Parts gripping the conductors are of metal		P
	Gripping parts cannot unduly damage conductors		P
	Terminals readily accessible under the intended conditions of installation		P
7.1.3	Fuse-contacts		P
	Fuse-contacts are such that necessary contact force is maintained under the conditions of service and operation		P
	Contact is such that electromagnetic forces occurring during operation under conditions in accordance with 7.5 not impair electrical connections between		P
	a) fuse-base and fuse-carrier		N/A
	b) fuse-carrier and fuse-link		N/A
	c) fuse-link and fuse-base		P
	Fuse contacts are so constructed and of such material that, when fuse is properly installed and service conditions are normal, adequate contact is maintained		P
	a) after repeated engagement and disengagement		P
	b) after being left undisturbed in service for long period		P
7.1.4	Construction of a gauge-piece		P
	Gauge-piece is so designed that it withstands normal stresses occurring during use		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.5	Mechanical strength of fuse-link		P
	Fuse-link have adequate mechanical strength and its contacts are securely fixed		P
7.2	Insulating properties and suitability for isolation		P
	Fuses are such that they do not lose insulating properties at voltages to which they are subjected in normal service		P
	Fuse passes the tests for verification of insulating properties and suitability for isolation in accordance with 8.2		P
7.3	Temperature rise, power dissipation of the fuse-link and acceptable power dissipation of the fuse-holder		P
	See Table 5 :		P
	Requirements are verified by tests according to 8.3		P
7.4	Operation		P
	Fuse-link is so designed and proportioned that, when tested in its appropriate test arrangement at rated frequency and ambient air temperature of $(20 \pm 5)^\circ\text{C}$		P
	- is able to carry continuously any current not exceeding its rated current		P
	- is able to withstand overload conditions as they may occur in normal service (see 8.4.3.4)		P
	Fuse-link satisfy these conditions if it passes the tests prescribed in 8.4		P
7.5	Breaking capacity		P
	Fuse is capable of breaking, at rated frequency and at voltage not exceeding the recovery voltage specified in 8.5, any circuit having prospective current between		P
	- current I_f (for "g" fuse-links) :		P
	- current $k_2 I_n$ (for "a" fuse-links) :		N/A
	- for a.c., rated breaking capacity at power factors not lower than those in Table 20 :		P
	- for d.c., rated breaking capacity at time constants not greater than those limits in Table 21 :		N/A
	Arc voltage not exceed values given in Table 6..... :		P
	Fuse satisfy these conditions if it passes the tests prescribed in 8.5		P
7.6	Cut-off current characteristic		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Values of cut-off current measured as specified in 8.6 are less than, or equal to, the values corresponding to cut-off current characteristics assigned by the manufacturer		P
7.7	I ² t characteristics		P
	Pre-arcing I ² t values verified according to 8.7 (Table 7)		P
	Operating I ² t values verified according to 8.7		P
7.8	Overcurrent discrimination of fuse-links		P
7.9	Protection against electric shock		P
	The degree of protection when the fuse is under normal service conditions:	IP00	P
	The degree of protection when replacing the fuse-link:	IP00	P
	The degree of protection when the fuse-link and fuse-carrier is removed:	IP	N/A
7.9.1	Clearances and creepage distances		P
	Clearances are not less than the values given in Table 9		P
	Creepage distances correspond to material group, as defined in 2.7.1.3 of IEC 60664-1, corresponding with rated voltage given in Table 10	500V	P
7.9.2	Leakage currents of equipment suitable for isolation		N/A
	Value of leakage current (mA) not exceed		N/A
	- 0,5 mA per pole for fuses in new conditions		N/A
	- 2 mA per pole for fuses having been submitted to test according to 8.5		N/A
7.9.3	Additional constructional requirements for fuses with non-separable fuse-carriers, suitable for isolation		N/A
	Fuse-holder are marked with the symbol IEC 60617-S00369		N/A
	When fuse is in open position, with fuse-link remaining inside the fuse-carrier, isolating distance between the fuse contacts in accordance with the isolating function are provided		N/A
	Indication of this position is provided by the position of the fuse-carrier		N/A

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	There exists a locking means in order to lock the fuses in the isolated position, locking is possible only in this position		N/A
	Fuses are designed so that the fuse-carrier remains attached to the fuse-base giving correct indication of the open position, and of locking		N/A
7.10	Resistance to heat		P
	All components are sufficiently resistant to heat which may occur in normal use (see 8.9 and 8.10)		P
7.11	Mechanical strength		P
	All components of fuse are sufficiently resistant to mechanical stresses which may occur in normal use (see 8.3 to 8.5 and 8.11.1)		P
7.12	Resistance to corrosion		P
	All metallic components of fuse are resistant to corrosive influences which may occur in normal use		P
7.12.1	Resistance to rusting		P
	Ferrous components are so protected that they meet relevant tests (see 8.2.4.2 and 8.11.2.3)		P
7.12.2	Resistance to season cracking		P
	Current-carrying parts are sufficiently resistant to season cracking (see 8.2.4.2 and 8.11.2.1)		P
7.13	Resistance to abnormal heat and fire		P
	All components of fuse are sufficiently resistant to abnormal heat and fire (see 8.11.2.2)		P
7.14	Electromagnetic compatibility		N/A
	Fuses within the scope of this standard are not sensitive to normal electromagnetic disturbances		N/A
	No immunity tests are required		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8	TESTS		
8.1.2	At the beginning of each test, the fuse is approximately at the ambient temperature		P
8.1.3	Tests made on fuses in clean and dry condition		P
8.1.4	Arrangement of the fuse and dimensions		P
	Except for degree of protection test (see 8.8), fuse are mounted in free air in draught-free surroundings in the normal operation position and on insulating material of sufficient rigidity		P
	Before tests are started, specified external dimensions are measured and results compared with dimensions specified in the relevant data sheet of the manufacturer or specified in subsequent parts	Part II	P
8.1.5	Testing of fuse-links		P
	Fuse-links tested with the kind(s) of current for which they are rated		P
	Fuse-links tested for a.c. with frequency for which they are rated		P
8.1.5.1	Complete tests		P
	Internal resistance R measured by a current $\leq 0,1 I_n$		P
	Measuring current (A)		P
	Ambient air temperature in range of $20 \pm 5 \text{ }^\circ\text{C}$		P
	The values of resistance	(see appended table)	P
8.1.5.2	Testing of fuse-links of a homogeneous series		P
	Fuse-links tested like a homogeneous series	Yes/No	P
	If yes: fuse-links have identical enclosures in form and construction (except of fuse-elements and contacts)		P
	- the same arc-extinguishing medium and same completeness of filling		P
	- fuse-elements of identical materials		P
	- their cross-section of fuse-elements not exceed the cross-section of fuse-links having the highest rated current		P
	- number of fuse-elements do not exceed number of fuse-elements of fuse-links with the highest rated current		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum distances between adjacent fuse-elements and between the fuse-elements and the inner surface of the cartridge is not less than those in the fuse-link with the highest rated current		P
	- fuse-links used with a given fuse-holder, or		P
	- fuse-links intended to be used in an arrangement identical for all rated currents of the homogeneous series		N/A
	- value of $RI_n^{3/2}$ does not exceed the value for the fuse-link with largest rated current of the homogeneous series (R measured as indicated in 8.1.5.1)		N/A
	the rated breaking capacity of fuse-links not greater than that of the fuse-link with the largest rated current within the homogeneous series		P
	- if not, the fuse-links with greater breaking capacity subjected to tests no. 1 and no. 2		N/A
	The fuse-link having the largest rated current tested completely according to Table 11		P
	The fuse-link having the smallest rated current tested only according to Table 12		P
	The fuse-links between the largest and smallest rated current tested according to Table 13		P
8.1.6	Testing of fuse-holders		P
	The fuse-holders are subjected to the tests according to Table 14		P
8.2	Verification of the insulating properties and of the suitability for isolation		P
8.2.1	Arrangement of the fuse-holder		P
	The fuse-holder fitted with a fuse-links of the largest dimensions for the type of fuse-holder concerned		P
	The fuse-base fixed to a metal plate, unless otherwise specified		P
	Fuse-link is replace while live - surfaces of fuse-link, of device for replacing it or of fuse-carrier, if of insulating material, are provided with metal coverings connected during tests to the frame of the apparatus; if of metal, they are connected direct to the frame		P
8.2.2	Verification of the insulating properties		P
	Points of application of the test voltage		P
	The test voltage is applied between:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) live parts and the frame with the fuse-link and the device for replacing it, or		P
	the fuse-carrier, if any, in position		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		P
	b) the terminals without fuse-link, device for replacing or the fuse-carrier		P
	no breakdown of insulation or flashover during 1 min of the applying test voltage		P
	c) live parts of different polarity in the case of multipole fuse-holder with fuse-links, fuse-carrier(s) or device(s) for replacing the fuse-links		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		N/A
	d) live parts which in the case of a multipole fuse-holder reach different potential after the fuse-link operates (equipped by fuse-carrier or device for replacing without fuse-link)		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		N/A
	The r.m.s. value of test voltage (V) as specified in Table 15	1890V	P
8.2.2.3.2	Fuse-holder is subjected to humid atmospheric conditions		P
	Relative humidity of ambient air (%)	91-95	P
	Ambient air temperature (°C)	20-30	P
	Duration of treatment (h)	144	P
	Insulation resistance is measured between the points prescribed in 8.2.2.1 by applying d.c. voltage of approximately 500 V		P
	Points of measuring:		P
	a) min. measured value (MΩ)	200MΩ	P
	b) min. measured value (MΩ)	200MΩ	P
	c) min. measured value (MΩ)		N/A
	d) min. measured value (MΩ)		N/A
	The insulation resistance not less than MΩ	1MΩ	P
8.2.3	Verification of the suitability for isolation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Clearances larger than values given in Table 9 are verified by dimensional measurement or by voltage test		N/A
	Points of application of the test voltage		N/A
	The test voltage is applied between:		N/A
	- terminals when the fuse-link and device for replacing it, are removed		N/A
	Test voltage (kV) for verification of the rated impulse withstand voltage is given in Table 16	kV	N/A
	The 1,2/50 μ s impulse voltage applied 5 times for each polarity at intervals of 1 s minimum		N/A
	no breakdown of insulation or flashover during of the applying test voltage		N/A
	no disruptive discharge during the test		N/A
8.2.4.2	Fuse-holder is subjected to humid atmospheric conditions		N/A
	Relative humidity of ambient air (%)		N/A
	Ambient air temperature ($^{\circ}$ C)		N/A
	Duration of treatment (h)		N/A
	Insulation resistance is measured between the points prescribed in 8.2.2.1 by applying d.c. voltage of approximately 500 V		N/A
	Points of measuring:		N/A
	a) min. measured value (M Ω)		N/A
	b) min. measured value (M Ω)		N/A
	c) min. measured value (M Ω)		N/A
	d) min. measured value (M Ω)		N/A
	The insulation resistance not less than 1 M Ω		N/A
8.3	Verification of temperature rise and power dissipation		P
8.3.1	One fuse used for test (unless otherwise stated by the manufacturer) mounted in free air		P
	Test performed at an ambient air temperature of (20 \pm 5) $^{\circ}$ C		P
	Ambient air temperature during the test ($^{\circ}$ C)		P
	Cross-sectional area (see Table17) (mm ² or mm x mm)	120 mm ²	-

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Clause	Requirement + Test	Result - Remark	Verdict
	Tightened by torque; torque (Nm)	32Nm	-
8.3.2	The temperature of the fuse measured by method of measuring	Thermocouple	P
8.3.3	Measurement of the power dissipation of the fuse-link		P
	One fuse used for test (unless otherwise stated by the manufacturer) mounted in free air		P
	Test performed at an ambient air temperature of (20±5) °C		P
	Ambient air temperature during the test (°C)	20°C	P
	Cross-sectional area (see Table17) (mm ² or mm x mm)	120 mm ²	-
	Tightened by torque; torque (Nm)	32Nm	-
8.3.4.1	Temperature rise of the fuse-holder		P
	Applied a.c. current (A) for test equal to the rated current of the fuse-holder	250A	P
	Test made with fuse-link (A), or	250A	P
	with a dummy fuse-link specified in subsequent parts	Part II	P
	Temperature rise limits T for contacts and terminals (Table 5):		P
	spring loaded contacts; limit (K)	unenclosed / enclosed max. 38K<65K	P
	bolted contacts; limit (K)	unenclosed / enclosed	N/A
	terminals; limit (K)	unenclosed / enclosed max. 39K<65K	P
8.3.4.2	Power dissipation of a fuse-link		P
	The test made with a.c. at the current (A) equal to the rated current of the fuse-link	250A	P
	The points of measuring	Central of blade	P
	Measured value of power (W) dissipation in limits (W) specified in subsequent parts	19,2W<23W	P
8.3.5	The acceptable power dissipation (W) of fuse-holder not less than the rated power dissipation of the corresponding fuse-links		P
	After the tests prescribed in 8.3, the insulating parts of the fuse-holders cooled down to ambient temperature withstood the test voltage according to 8.2	1890V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No deformation after tests of 8.3		P
8.4	Verification of operation	For 250A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	120	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I_{nf}) (see Table 2)	312,5A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I_f) (see Table 2)	400A	-
	the fuse-link operated within the conventional time of (minutes) (Table 2)	2054s	P
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	3h	P
	Off-period of 0,1 of the conventional time	18min	P
	Test current (A) equal to 1,05 of the rated current . :	262,5A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I_{nf}) (see Table 2)	312,5A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
8.4	Verification of operation	For 224A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	95	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) the fuse-link subjected to the conventional non-fusing current (Inf) (see Table 2)	280A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (If) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	3h	P
	Off-period of 0,1 of the conventional time	18min	P
	Test current (A) equal to 1,05 of the rated current ..	235,2A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (Inf) (see Table 2)	280A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
8.4	Verification of operation	For 200A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	95	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (Inf) (see Table 2)	250A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (If) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P

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Clause	Requirement + Test	Result - Remark	Verdict
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h) :	3h	P
	Off-period of 0,1 of the conventional time :	18min	P
	Test current (A) equal to 1,05 of the rated current . :	210A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	250A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2) :	3h	P
8.4	Verification of operation	For 160A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17 :	70	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	200A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2) :	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2) :		-
	the fuse-link operated within the conventional time of (minutes) (Table 2) :		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h) :	2h	P
	Off-period of 0,1 of the conventional time :	12min	P
	Test current (A) equal to 1,05 of the rated current . :	168A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	200A	-

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Clause	Requirement + Test	Result - Remark	Verdict
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
8.4	Verification of operation	For 125A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	50	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	156,3A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	2h	P
	Off-period of 0,1 of the conventional time	12min	P
	Test current (A) equal to 1,05 of the rated current . :	131,3A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	156,3A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
8.4	Verification of operation	For 100A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	35	P
8.4.2	Ambient air temperature during test within (20±5) °C		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	125A	--
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	2h	P
	Off-period of 0,1 of the conventional time	12min	P
	Test current (A) equal to 1,05 of the rated current . .	105A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	125A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
8.4	Verification of operation	For 80A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	25	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	100A	--
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)	128A	-

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Clause	Requirement + Test	Result - Remark	Verdict
	the fuse-link operated within the conventional time of (minutes) (Table 2)	3916s	P
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	2h	P
	Off-period of 0,1 of the conventional time	12min	P
	Test current (A) equal to 1,05 of the rated current . :	84A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	100A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
8.4.3.3	Verification of time-current characteristics and gates		P
8.4.3.3.1	The time-current characteristics verified on the basis of the test according to 8.5		P
	Values of pre-arcing and operating times within the time-current zones:		P
	- indicated by the manufacturer		N/A
	- specified in subsequent parts	Part II	P
	Verification for smaller current ratings, if only one largest rated current fuse-link is subjected to the test according to 8.5 (in case of homogeneous series):		N/A
	"g" fuse-links (except "gD", "gG" and "gM")		N/A
	Tests made in connection with verification of the gates (see 8.4.3.3.2)		N/A
	Ambient air temperature within (20±5) °C		N/A
	rated current I _n (A) of the fuse-link		-
	test performed at voltage (V)		-
	test 3a) prospective current (A) equal to kI _n (10 ≤ k ≤ 20)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	test 4a) prospective current (A) equal to kI _n (5 ≤ k ≤ 8)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	test 5a) prospective current (A) equal to kI_n ($2,5 \leq k \leq 4$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	Verification for smaller current ratings, if only one largest rated current fuse-link is subjected to the test according to 8.5 (in case of homogeneous series):		N/A
	"a" fuse-links		N/A
	Ambient air temperature within $(20 \pm 5) ^\circ\text{C}$		N/A
	rated current I_n (A) of the fuse-link		-
	test performed at voltage (V)		-
	test 3a) prospective current (A) equal to $nk_2 I_n$ ($5 \leq n \leq 8$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	test 4a) prospective current (A) equal to $nk_2 I_n$ ($2 \leq n \leq 3$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	test 5a) prospective current (A) equal to $nk_2 I_n$ ($1 \leq n \leq 1,5$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	250	-
	test performed at voltage (V)	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s	750A;72s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	1650A;2,3s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	2590A;680ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	4500A;8ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-

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Clause	Requirement + Test	Result - Remark	Verdict
	test performed at voltage (V)		
	Cross-sectional area (see Table18) (mm ² or mm x mm)		
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	224	-
	test performed at voltage (V)	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s	610A;79s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	1250A;2,8s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	1910A;810ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	3420A;10ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm).....		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P

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Clause	Requirement + Test	Result - Remark	Verdict
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	200	—
	test performed at voltage (V) :	Not specified	—
	a) testing current (A); pre-arcing time (s) higher than 10 s :	610A;68s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	1250A;2,7s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	1910A;730ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	3420A;8ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		—
	test performed at voltage (V) :		—
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		—
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	160	—
	test performed at voltage (V) :	Not specified	—
	a) testing current (A); pre-arcing time (s) higher than 10 s :	460A;70s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	950A;2,4s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	1450A;710ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	2590A;9ms	P
	"aM" fuse-links		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	rated current of the fuse-link (A)..... :		–
	test performed at voltage (V) :		–
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		–
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	“gG” and “gM” fuse-links	“gG” / “gM”	P
	rated current of the fuse-link (A)..... :	125	–
	test performed at voltage (V) :	Not specified	–
	a) testing current (A); pre-arcing time (s) higher than 10 s :	355A;59s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	715A;2,1s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	1100A;690ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	1910A;9ms	P
	“aM” fuse-links		N/A
	rated current of the fuse-link (A)..... :		–
	test performed at voltage (V) :		–
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		–
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	100	—
	test performed at voltage (V) :	Not specified	—
	a) testing current (A); pre-arcing time (s) higher than 10 s :	290A;66s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	580A;2,8s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	820A;810ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	1450A;10ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		—
	test performed at voltage (V) :		—
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		—
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	80	—
	test performed at voltage (V) :	Not specified	—
	a) testing current (A); pre-arcing time (s) higher than 10 s :	215A;70s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	425A;2,4s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	610A;770ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	1100A;9ms	P

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Clause	Requirement + Test	Result - Remark	Verdict
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		-
	test performed at voltage (V) :		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		-
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.4	Overload	For 80A and 250A	P
	The test arrangement is same as that for the temperature rise test (see 8.3.1)		P
	Three fuse-links submitted to 50 pulses having the same duration and test current :		P
	test performed at voltage (V) :	Not specified	-
	"g" fuse-links:		P
	test current (A) equal to 0,8 times the current stated for a pre-arcing time of 5 s :	208A/760A	P
	duration of each pulse 5 s		P
	time (s) interval between pulses equal to 20 % of the conventional time (s) specified in Table 2 :	24min/36min	P
	"a" fuse-links:		N/A
	rated current I_n (A) of fuse-link :		N/A
	test current (A) equal to $k_1 I_n \pm 2\%$:		N/A
	the pulse duration (s) corresponds to that indicated on the overload curve for $k_1 I_n$ stated by manufacturer :		N/A
	time (s) intervals between pulses equal to 30 times the pulse duration :		N/A
	fuse-links having ambient air temperature subjected to a current (A) equal to current for the overload test	208A/760A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	pre-arcing time (s) of sample lies within the manufacturers time-current zone	1) 83s/64,9s 2) 100s/46,3s 3) 92s/57,2s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	95	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	200A	P
	for a time (h) equal to the conventional time	3h	P
	test current increased to 1,45 I _z (A) (I _z specified in Table 19)	308,9A	P
	the fuse-link operated in time (s) less than the conventional time (s)	2485s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	70	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	160A	P
	for a time (h) equal to the conventional time	2h	P
	test current increased to 1,45 I _z (A) (I _z specified in Table 19)	243,6A	P
	the fuse-link operated in time (s) less than the conventional time (s)	2725s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	25	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	80A	P
	for a time (h) equal to the conventional time	2h	P
	test current increased to 1,45 I _z (A) (I _z specified in Table 19)	123,3A	P
	the fuse-link operated in time (s) less than the conventional time (s)	3007s	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3.6	Operation of indicating devices and strikers, if any		P
	Operation of indicating device verified in combination with the verification of breaking capacity (see 8.5.5)		P
	The verification of striker operation:		N/A
	"g" fuse-link tested at current (A) equal to current I_4 (see Table 20 and 21)		N/A
	recovery voltage (V)		N/A
	stated recovery voltage (V)		N/A
	"a" fuse-link tested at current (A) equal to current $2k_1 I_n$ (A) (see Figure 2)		N/A
	recovery voltage (V)		N/A
	stated recovery voltage (V)		N/A
	Striker operate during all tests made at recovery voltage of at least 20 V		N/A
	No failure of indicating device or striker		P
8.5	Verification of the breaking capacity		P
8.5.1	The test arrangements as specified in 8.1.4		P
8.5.2	Characteristics of the test circuit as specified		P
	Scheme of test circuit (see Figure 5)		P
	Deviations form specified characteristics of test circuit		P
8.5.3	Measuring instruments		P
8.5.4	Calibration of test circuit		P
	Calibration oscillograms and their evaluation		P
8.5.6	The breaking-capacity tests made at an ambient air temperature of $(20 \pm 5) ^\circ\text{C}$		P
	Breaking-capacity tests on a.c. fuses		P
8.5.5.1	Table 20, test No. 1 for "g" and "a" fuse-links	For 80A	P
	Rated breaking capacity of the fuse-links (kA), at voltage (V)	120kA,500VAC	-
	Rated current (A) of the fuse-links	80A	P
	Prospective current I_1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%	120kA	P
	Power factor	0,20	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Initiation of arcing after voltage zero: within 40° - 65° for sample 1 and within 65° - 90° for sample 2 and 3, or	1) 46,0 2) 68,0 3) 77,0	P
	for sample 1) arcing after voltage zero within 0° + 10°, - 0°		N/A
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568V 2) 568V 3) 568V	P
	Cut-off current (A)	1) 3,7kA 2) 3,8kA 3) 3,7kA	P
8.5.8	Acceptability of No. 1 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	918,6V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 15 2) 25 3) 15	P
8.5.5.1	Table 20, test No. 1 for "g" and "a" fuse-links	For 250A	P
	Rated breaking capacity of the fuse-links (kA), at voltage (V)	120kA,500VAC	-
	Rated current (A) of the fuse-links	250A	P
	Prospective current I1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%	120kA	P
	Power factor	0,20	P
	Initiation of arcing after voltage zero: within 40° - 65° for sample 1 and within 65° - 90° for sample 2 and 3, or	1) 50,0 2) 65,0 3) 66,0	P

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Clause	Requirement + Test	Result - Remark	Verdict
	for sample 1) arcing after voltage zero within 0° + 10°, - 0°		N/A
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568V 2) 568V 3) 568V	P
	Cut-off current (A)	1) 16,4kA 2) 17,8kA 3) 18,2kA	P
8.5.8	Acceptability of No. 1 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	931,7V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 40 2) 50 3) 35	P
8.5.5.1	Table 20, test No. 2 for "g" and "a" fuse-links		P
	Prospective current I ₂ (kA)	15,00kA	P
	Test made under conditions which approximate those giving maximum arc energy		P
	Power factor	0,20	P
	Making angle after voltage zero: within tolerance 0° + 20°, - 0°	1) 8,0 2) 5,0 3) 10,0	P
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568 2) 568 3) 568	P
	Recovery voltage maintained at a value (V); duration (s) for sample (No.)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	For other samples duration 15 s (8.5.5.2)		P
8.5.8	Acceptability of No. 2 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	912,3V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 400 2) 300 3) 400	P
8.5.5.1	Table 20, test No. 2* for "g" and "a" fuse-links, for $I_2 \geq I_1$	(see appended table)	N/A
	Prospective current I_2 (kA) for test No. 2 greater than the rated breaking capacity (kA)		N/A
	Test made on six samples replacing tests of Nos. 1 and 2. Test made with current I_1 (kA)		N/A
	Making angels differ approximately 30° between each test		N/A
	Power factor		N/A
8.5.8	Acceptability of No. 2 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.5.1	Table 20, test No. 3 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_3 (A) equal to $3,2 I_f$	1300A	P
	Prospective current for "a" fuse-link I_3 (A) equal to $2,5 k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current $\pm 20\%$		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2)		P
8.5.8	Acceptability of No. 3 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 15 2) 3)	P
8.5.5.1	Table 20, test No. 4 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_4 (A) equal to $2,0 I_f$	820A	P
	Prospective current for "a" fuse-link I_4 (A) equal to $1,6 k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current + 20%, - 0%		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2) :		P
8.5.8	Acceptability of No. 4 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P

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Clause	Requirement + Test	Result - Remark	Verdict
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 10 2) 3)	P
8.5.5.1	Table 20, test No. 5 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_5 (A) equal to $1,25 I_f$	520A	P
	Prospective current for "a" fuse-link I_5 (A) equal to $k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current + 20%, - 0%		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2) :		P
8.5.8	Acceptability of No. 5 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 30 2) 3)	P
	Breaking-capacity tests on d.c. fuses		N/A
8.5.5.1	Table 21, d.c.test No. 1 for "g" and "a" fuse-links		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated breaking d.c. capacity of the fuse-links (kA), at voltage (V)		-
	Rated current (A) of the fuse-links		N/A
	Rated voltage (V) of the fuse-links		N/A
	Prospective current I_1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 1 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 2 for "g" and "a" fuse-links		N/A
	a) During test No. 1 arcing commences at a current $\geq 0,5 I_1$, test No. 2 was not performed		N/A
	b) Prospective current I_2 (A). Test made under conditions which approximate those giving maximum arc energy		N/A
	Time constant (ms) between 15 to 20 ms		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Arcing commences at current (A)	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 2 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 3 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A)		-
	Prospective current I_3 (A) equal to 3,2 I_f		N/A
	Tolerance on current (%) ± 20%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 3 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 4 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A) :		-
	Prospective current I ₄ (A) equal to 2,0 I _f :		N/A
	Tolerance on current (%) + 20%, - 0% :		N/A
	Time constant (ms) between 15 to 20 ms :		N/A
	Arcing commences at current (A) :	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 4 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6) :		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.5.1	Table 21, d.c.test No. 5 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A) :		-
	Prospective current I_s (A) equal to $1,25 I_f$:		N/A
	Tolerance on current (%) + 20%, - 0% :		N/A
	Time constant (ms) between 15 to 20 ms :		N/A
	Arcing commences at current (A) :	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances $115 + 5\%$, - 9% of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 5 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6) :		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance ($M\Omega$) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.6	Verification of the cut-off current characteristics		P
8.6.2	The values measured did not exceed cut-off characteristics indicated by the manufacturer (see 5.8.1)		P
8.7	Verification of I^2t characteristics and overcurrent discrimination		P
8.7.2	The operating I^2t values measured not exceed the values indicated by the manufacturer, or		P
	those specified in subsequent parts		P
	The pre-arcing I^2t values not less than minimum pre-arcing values given by the manufacturer, or		N/A

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	they lie within the limits indicated in Table 7		P
8.7.3	Verification of compliance for fuse-links at 0,01 s		P
	"gG" and "gM" fuse-links at 0,01 s comply with Table 7		P
8.7.4	Verification of overcurrent discrimination		P
	The discrimination of the fuse-links verified by means of the time-current characteristics and the pre-arcing and operating I^2t values		P
8.8	Verification of the degree of protection of enclosures		P
	Degree of protection IP : IP00		P
	Verification by test under conditions specified in IEC 60529 :		P
8.9	Verification of resistance to heat		P
	No damage impaired by heat during the previous tests (in particular with respect to 8.3, 8.4, 8.5 and 8.10)		P
8.10	Verification of non-deterioration of contacts		P
8.10.1	Three samples provided with standardized dummy fuse-links of the highest current rating (A) intended to be used in the fuse-holder (see subsequent parts) :		P
8.10.2	Test current (A) for load period :	312,5A	P
	Duration (s) of load period :	0,75h	P
	Duration (s) of no-load period :	0,3h	P
	a) Test of 250 cycles, measured values not exceed the limits given in subsequent parts		P
	b) Test of 750 cycles, measured values not exceed the limits given in subsequent parts		P
8.11	Mechanical and miscellaneous tests		P
8.11.1	Mechanical strength		P
	Mechanical characteristics of fuse and its parts judged in the context of normal handling and mounting as well as with results shown after breaking-capacity test (see 8.5), if not otherwise specified in the subsequent parts		P
8.11.2	Miscellaneous tests		P
8.11.2.1	Verification of freedom from season cracking		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Current-carrying parts made of rolled copper alloy with less than 83% copper content and with all grease removed, placed for 4 h in test cabinet having temperature of $(30 \pm 10) ^\circ\text{C}$		P
	After this, samples placed for 8 h in test cabinet, on the bottom of which is ammonium chloride solution having pH value 10 - 11		P
	After test no cracks visible to the unaided eye		P
8.11.2.2	Verification of resistance to abnormal heat and fire		P
8.11.2.2.1	Parts of insulating material, except ceramic, have a limited duration of burning without spreading fire by flames or burning droplets or glowing particles falling from the specimen		P
8.11.2.2.5	Glow-wire test: $(650 \pm 10) ^\circ\text{C}$		N/A
	Parts of insulating materials not necessary to retain current-carrying parts in position even though they are in contact with them, made the glow-wire test $(650 \pm 10) ^\circ\text{C}$		N/A
	No visible flame, or burning or glowing of the specimen extinguish within max. (s) after removal of the glow-wire. Limit $(30 \pm 1) \text{ s}$		N/A
	No burning of the tissue paper		N/A
	No scorching of the pinewood board		N/A
	Glow-wire test: $(960 \pm 10) ^\circ\text{C}$	No flame	P
	Parts of insulating materials necessary to retain current-carrying parts and parts of the earthing circuit, if any, in position, made the glow-wire test $(960 \pm 10) ^\circ\text{C}$		P
	No visible flame, or burning or glowing of the specimen extinguish within max. (s) after removal of the glow-wire. Limit $(30 \pm 1) \text{ s}$		P
	No burning of the tissue paper		P
	No scorching of the pinewood board		P
8.11.2.3	Verification of resistance to rusting		P
	Tested parts after degreasing (10 min in specified solution) placed for 10 min in air saturated with moisture and after that dried 10 min in an ambient temperature $(100 \pm 5) ^\circ\text{C}$		P
	Surface of tested parts show no signs of rust		P

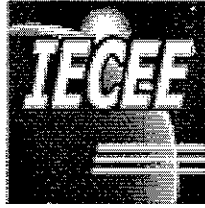
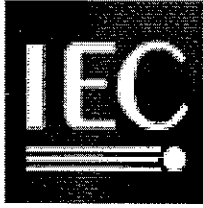
IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict

APPENDIX 1

8.1.5.1	TABLE: Internal resistance of the fuse-links											P	
	a) rated current (A) of the fuse-link		:									80	—
	measuring current (A)		:									8	—
	ambient air temperature (°C)		:									25	—
internal resistance	sample No.												
	1	2	3	4	5	6	7	8	9	10	11	12	
R (mΩ)	0,789	0,806	0,810	0,802	0,821	0,821	0,835	0,790	0,821	0,805	0,839	0,817	
internal resistance	sample No.												
	13												
R (mΩ)	0,821												
	b) rated current (A) of the fuse-link		:									100	—
	measuring current (A)		:									10	—
	ambient air temperature (°C)		:									25	—
internal resistance	sample No.												
	1	2	3	4	5								
R (mΩ)	0,651	4,648	0,663	0,659	0,659								
	c) rated current (A) of the fuse-link		:									125	—
	measuring current (A)		:									12,5	—
	ambient air temperature (°C)		:									25	—
internal resistance	sample No.												
	1	2	3	4	5								
R (mΩ)	0,549	0,546	0,537	0,546	0,547								
	c) rated current (A) of the fuse-link		:									160	—
	measuring current (A)		:									16	—
	ambient air temperature (°C)		:									25	—
internal resistance	sample No.												
	1	2	3	4	5	6							
R (mΩ)	0,405	0,407	0,400	0,406	0,406	0,404							
	c) rated current (A) of the fuse-link		:									200	—
	measuring current (A)		:									20	—
	ambient air temperature (°C)		:									25	—
internal resistance	sample No.												
	1	2	3	4	5	6							
R (mΩ)	0,318	0,322	0,329	0,320	0,340	0,332							
	c) rated current (A) of the fuse-link		:									224	—
	measuring current (A)		:									22,4	—

IEC 60269-1													
Clause	Requirement + Test											Result - Remark	Verdict
	ambient air temperature (°C) :											25	—
internal resistance	sample No.												
	1	2	3	4	5								
R (mΩ)	0,274	0,280	0,279	0,288	0,282								
	c) rated current (A) of the fuse-link :											250	—
	measuring current (A) :											25	—
	ambient air temperature (°C) :											25	—
internal resistance	sample No.												
	1	2	3	4	5	6	7	8	9	10	11	12	
R (mΩ)	0,249	0,253	0,252	0,250	0,259	0,253	0,254	0,248	0,251	0,253	0,259	0,252	
internal resistance	sample No.												
	13	14	15										
R (mΩ)	0,239	0,243	0,247										

8.5.5.1	TABLE: Table 20, test No. 2* for "g" and "a" fuse-links, for $I_2 \geq I_1$										N/A	
sample No.	making angle after voltage zero	recovery voltage		cut off current		resistance between contacts						
	(°)	(V)	(%)	(A)		(MΩ)						
1												
2												
3												
4												
5												
6												



Test Report issued under the responsibility of:



TEST REPORT IEC 60269-2 Low-voltage fuses Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to I	
Report Reference No.: 15033141 001 Part II Date of issue: 30.07.2009 Total number of pages: 18 pages	
CB Testing Laboratory: TÜV Rheinland (Shanghai) Co., Ltd. Address: 10-15/F, Huatsing Building, No.88, Lane 777, Guangzhong Road West, 200072 Shanghai Zhabei District, P.R. China	
Applicant's name: Wenzhou Jinlida Electrical Co., Ltd. Address: Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604 P.R. China	
Test specification: Standard: IEC 60269 - 2 : 2006 (third edition) (see also IEC 60269 – 1:1998) Test procedure: CB Non-standard test method: N/A	
Test Report Form No.: IEC60269_2A Test Report Form(s) Originator: EZU Master TRF: Dated 2007-12	
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Test item description: Fuses(fuse link and fuse base) Trade Mark: JINLIDA Manufacturer: Same as applicant Model/Type reference: NH1 Ratings: AC 500V; 80A,100A,125A,160A,200A,224A,250A; 120kA; Size 1	

Testing procedure and testing location:	
<input checked="" type="checkbox"/> CB Testing Laboratory: Testing location/ address.....:	TÜV Rheinland (Shanghai) Co., Ltd. Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
<input type="checkbox"/> Associated CB Test Laboratory: Testing location/ address.....:	
Tested by (name + signature).....: Approved by (+ signature):	
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature):	
Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature).....: Approved by (+ signature):	
Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature):	
Supervised by (+ signature).....: Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature):	
Supervised by (+ signature).....: Testing location/ address.....:	

Summary of testing:	
Tests performed (name of test and test clause): For homogeneous series of NH1, type tests are listed in table 11, 12, 13 and 14 in EN 60269-1:2006	Testing location: Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
Summary of compliance with National Differences: N/A	

Copy of marking plate:
Refer to 15033141 001 Part I.

Test item particulars:	
Classification of installation and use.....:	See part I
Supply Connection	See part I
Fuse system.....:	A/B/C/D/E/F/G/H/I
.....:	
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	06.2009
Date (s) of performance of tests	06.2009-07.2009
General remarks:	
<p>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. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>	
General product information:	
N/A	

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
Requirements IEC 60269-1			
FUSE SYSTEM A – FUSES WITH FUSE-LINKS WITH BLADE CONTACTS (NH FUSE SYSTEM)			
5	CHARACTERISTICS OF FUSES		
5.2	Rated voltage (V) as specified	500VAC	P
5.3.1	Rated current (A) of the fuse-link in accordance with specified values		P
5.3.2	Rated current (A) of the fuse-holder and the size of the fuse-link	Size 1	P
5.5	Rated power (W) dissipation of fuse-link see Figure 101	<23W	P
	Rated acceptable power (VA) dissipation of fuse-bases given in Figure 102	32W	P
5.6	Limits of time-current characteristics		P
5.6.1	Time-current characteristics, time-current zones and overload curves		P
5.6.2	Conventional times and current see Table 101		P
5.6.3	Gates		P
5.7.2	Rated breaking capacity (A)	120kA	P
6	MARKING		
	Markings are legible		P
6.1	Fuse-holders marked by:		P
	- IEC 60269-2		P
	- size	1	P
	Marking of rated current and rated voltage are discernible from the front		P
6.2	Fuse-links marked by:		P
	- IEC 60269-2		P
	- size or reference	1	P
	- rated breaking capacity	120kA	P
	Marking of rated current and rated voltage are discernible from the front		P
	Fuse-links are marked as described in Table 104.. :		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
7	STANDARD CONDITIONS FOR CONSTRUCTION		
7.1	Mechanical design		P
	The dimensions of the fuse-links given in Figure 101		P
	Dimensions:		P
	dimension marking a1: prescribed (mm); measured (mm)	135±2,5;	P
	dimension marking a2: prescribed (mm); measured (mm)	75-10;	P
	dimension marking a3: prescribed (mm); measured (mm)	62±1,5;	P
	dimension marking a4: prescribed (mm); measured (mm)	68±1,5;	P
	dimension marking b1min: prescribed (mm); measured (mm)	20;	P
	dimension marking b2min: prescribed (mm); measured (mm)	5;	P
	dimension marking b3max: prescribed (mm); measured (mm)	6;	P
	dimension marking b4min: prescribed (mm); measured (mm)	17;	P
	dimension marking c1: prescribed (mm); measured (mm)	40;	P
	dimension marking c2: prescribed (mm); measured (mm)	11-2;	P
	dimension marking d: prescribed (mm); measured (mm)	2,5+1,5/-0,5	P
	dimension marking e1max: prescribed (mm); measured (mm)	53;	P
	dimension marking e2max: prescribed (mm); measured (mm)	52;	P
	dimension marking e3: prescribed (mm); measured (mm)	20+5/-2;	P
	dimension marking e4: prescribed (mm); measured (mm)	6;	P
	dimension marking f: prescribed (mm); measured (mm)	15;	P
	dimension marking z: prescribed (mm); measured (mm)	5	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The dimensions of the fuse-base given in Figure 102		P
	Dimensions:		P
	dimension marking g: prescribed (mm); measured (mm)	53 ± 1;	P
	dimension marking h: prescribed (mm); measured (mm)	175 ± 1,5;	P
	dimension marking n1max: prescribed (mm); measured (mm)	52;	P
	dimension marking n2max: prescribed (mm); measured (mm)	60;	P
	dimension marking p1max: prescribed (mm); measured (mm)	55;	P
	dimension marking p2: prescribed (mm); measured (mm)	35;	P
	dimension marking r min: prescribed (mm); measured (mm)	17;	P
	dimension marking s max: prescribed (mm); measured (mm)	38;	P
	dimension marking t min: prescribed (mm); measured (mm)	21;	P
	dimension marking v: prescribed (mm); measured (mm)	80+3;	P
	dimension marking w1: prescribed (mm); measured (mm)	30 ± 0,7;	P
	dimension marking w2: prescribed (mm); measured (mm)	25 ± 0,7;	P
	dimension marking x min: prescribed (mm); measured (mm)	20;	P
	dimension marking y: prescribed (mm); measured (mm)	10,5 ± 0,5;	P
	dimension marking z max: prescribed (mm); measured (mm)	5	P
7.1.2	Connections, including terminals cross-sectional ranges (Table 105) torques to be applied (Table 111) (lug terminal)		P
7.1.3	Contact surfaces should be silver plated	Yes / No	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If no test according to 8.10 are passed with dummies described in 8.10.1		P
7.1.5	Dynamic short-circuit withstand shall meet cut-off currents (Table 112)		P
7.1.7	Construction of fuse-link		P
	Blade contacts made of solid material		P
	If any other construction, manufacturer demonstrate that construction adequate		N/A
	Endplates not permitted to protrude radially from insulation body		P
	preferable to insulate the gripping lugs from live parts		P
	Fuse-links has an indicator.....		P
	Electrically conductive parts of indicator not ejected from the fuse-link during operation		P
7.2	Insulating properties		P
	Creepage distances and clearances of fuses and fuse-accessories meet requirements of IEC 60664-1 for overvoltage category III and pollution degree 3...:		P
7.7	I^2t characteristics		P
	maximum pre-arcing I^2t (Table 7 of IEC 60269-1)		P
	rated currents lower than 16 A (Table 106)		N/A
	maximum operating I^2t for "aM" fuse-links (Table 107) test No. 2 of the largest rated current of each homogeneous series (Table 20 of IEC 60269-1):		N/A
7.8	Overcurrent discrimination of "gG" fuse-links (see 8.7.4, Table 108)		P
7.9	Protection against electric shock		P
	increased by means of partition walls and covers of fuse-contacts		P
	operation by authorized persons, instructed in electrical matters, using replacement handles according to this fuse system.....		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
8	TESTS		
	IEC 60269-1 applies with the following supplementary requirements		P
8.1.4	Arrangement of fuse and dimensions		P
	Requirements of 7.2 verified on fuse-bases :		P
	Creepage distances and clearances of fuse-links according to 7.2 are verified :		P
	Clearances verified on fuse-link inserted into model fuse-base according to Figure 111..... :		P
8.1.6	Testing of fuse-holders		P
	In addition to test given in IEC 60269-1 tested according to Table 109 :		P
8.2.2.1	Points of application of test voltage		P
	In addition to IEC 60269-1 e) between isolated metal gripping-lugs and terminals of test fuse-bases :	1890V	P
8.2.3.2	Value of test voltage	Not applicable	N/A
	rated impulse withstand voltage in Table 110..... :		N/A
8.2.3.3	Test method		N/A
	5 impulses of both polarities and of shape 1,2/50 μ s and rated withstand voltage level according to Table 110 : minimum period between impulses are 1 s :		N/A
8.2.4	Acceptability of test results		P
8.2.4.3	No flash-over or puncture shall occur during test ... :		P
8.2.5	Resistance to tracking		P
	plastic parts of fuse-links and fuse-bases tested and shall pass at PTI level stated by manufacturer :	500M	P
8.3	Verification of temperature rise and power dissipation		P
8.3.1	Arrangement of the fuse		P
	Tightened by torque (Nm) :	32	P
8.3.2	Measurement of the temperature rise		P
	Protective covers and fuse-carriers as provided by manufacturer mounted :		P
8.3.4.1	Temperature rise of the fuse-holder	See part I	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Dummy (Figure 105) Point at which temperature rise is measured (Figure 106)		P
8.3.4.2	Power dissipation of a fuse-link (Figure 106)	19,2W	P
8.4.3.1	Verification of conventional non-fusing and fusing current	See part I	P
	non-fusing current test – second test specimen are used for b)	See part I	P
8.4.3.5	Conventional cable overload protection test (for “gG” fuse-links only)	See part I	P
	Details of special test are given in Annex A	Not required	N/A
Annex A	Special test for cable overload protection		N/A
	For fuses with $I_n > 16$ A of the sizes 00, 0, 1 and 2. :		N/A
A.1	Arrangement of the fuse		N/A
	Three fuse-links in fuse-bases mounted in a box... :		N/A
	Ambient air temperature outside the fuse box shall be $(30^{+5}_0 \text{ } ^\circ\text{C})$	$^\circ\text{C}$	N/A
A.2	Test method and acceptability of test results		N/A
	$1,13 I_n$ flowed through the fuse-links for conventional time (see Table 2 of IEC 60269-1)	A for s	N/A
	Non of fuse-links operated		N/A
	Test current raised without interruption within 5 s to $1,45 I_n$	A	N/A
	One fuse-link operated within conventional time :		N/A
8.5.5.1	Verification of the peak withstand current of a fuse-base	Not applicable	N/A
	not be carried out , if this has already been verified during the breaking capacity test of fuse-links with the highest rating of the size		N/A
8.5.5.1.1	Arrangement of the fuse		N/A
	single-phase type, 8.5.1 of IEC 60269-1 peak values of the test currents (Table 112)		N/A
	maximum values (see 8.5.5.1.3)..... :		
	dummy fuse-link (Figure 101)		
8.5.5.1.2	Test method		N/A

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	fuse-base 1 (Figure107) resilient spring travel is limited to elastic range : contacts opened up three times :		N/A
	fuse-base 2 (see 8.11.1.2) F_{max} according to Table 118		N/A
8.5.5.1.3	Acceptability of test results		N/A
	fuse-links not be ejected		N/A
	no signs of arcing or welding or other damage		N/A
8.5.8	Acceptability of test results		N/A
	Fuse or circuit-breaker not operate during this test		N/A
8.7.4	Verification of overcurrent discrimination		P
	verified by I^2t values evaluated from the recorded test results		P
	Arrangement of the samples as for the breaking capacity test		P
	two samples tested at the r.m.s. prospective test current I , corresponding to minimum pre-arcing I^2t	1) 2)	P
	the other samples tested at the r.m.s. prospective test current I , corresponding to operating I^2t	3) 4)	P
	test voltage (V) :		
	The values of I^2t lie within corresponding limits specified in Table 113..... :		P
8.9	Verification of resistance to heat		P
	Tests apply to fuse-link and fuse-base		P
	Fuse-holder with fuse-links having maximum power dissipation are cyclically loaded as pre-treatment... :		P
	After cooling to normal temperature breaking capacity tested at I_1 (see 8.5)..... :	$I_1 = 120kA$	P
	Fuse-links with organic material Fuse-holder with fuse-links having maximum power dissipation are cyclically loaded as pre-treatment....		N/A
	After cooling to normal temperature breaking capacity tested at I_1 and I_5 (see 8.5)..... :	$I_1 =$ $I_5 =$	N/A
8.9.1	Fuse-base		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	test below apply if it is not obvious that components are not affected adversely by given temperature and withdrawal forces		P
8.9.1.1	Test arrangement		P
	Figure 105 and 108		P
	Test se-up in heating chamber		P
8.9.1.2	Test method		P
	Temperature of $(80^{+5}_0)^{\circ}\text{C}$ for 2 h		P
	160% rated current for 2 h..... :	160% $I_n = 400\text{A}$	P
	Test voltage :	50 V	
	3 min after switching off tensile force F_{max} (see Table 118) exerted for 15 s	$F_{\text{max}} =$	P
8.9.1.3	Acceptability of test results		P
	Contact pieces not have moved to affect the further use		P
	Dimensions of Figure 102 are considered		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.9.2	Fuse-links with gripping lugs of moulded material or of metal fixed in moulded material	No such part	N/A
8.9.2.1	Test arrangement		N/A
	Figure 108		N/A
8.9.2.2	Test method		N/A
	Temperature of $(80^{+5}_0)^{\circ}\text{C}$ for 2 h		N/A
	150% rated current for conventional time :	A for h	N/A
	Test voltage :	V	—
	3 min after fuse-link operated or conventional time expired tensile force F_{max} (see Table 118) exerted for 15 s	$F_{\text{max}} =$	N/A
8.9.2.3	Acceptability of test results		N/A
	Gripping lugs remain fully operational		N/A
	Dimensions of Figure 101 (d and c_2) not be exceeded by more than 2 mm		N/A
8.10	Verification of non-deterioration of contacts and direct terminal clamps		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.10.1	Arrangement of the fuse		P
	Figure 105		P
	for lug terminals, torque in Table 111..... :	32 Nm	
	Insulation of conductors removed over the whole length		P
8.10.1.2	Direct terminal clamps		P
	Test performed on 10 direct terminal clamps of five fuse-bases		P
	Distance between fuse-base centres of at least three times e_2 (see Figure 101)		P
	Torque of tightened of screws	Nm	
	Conductor cross-section	mm ²	
8.10.2	Test method		P
	Test current (A) for load period	312,5A	P
	Duration (s) of load period	0,75h	P
	Duration (s) of no-load period	0,3h	P
	Test voltage (V)	50V	—
	a) Test of 50 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	b) Test of 250 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	c) Test of 500 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	d) Test of 750 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
8.10.2.1	Contacts		P
	Points between voltage drop is measured (A and B in Figure 106)		P
	Withdrawal force (Table 118); measured force after 250 cycles (N)	1) 2) 3)	P

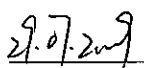
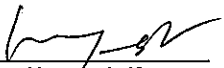
IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Withdrawal force (Table 118); measured force after 750 cycles (N)	1) 2) 3)	P
	If measured values too low, test of 8.5.5.1		N/A
8.10.2.2	Direct terminal clamps		P
	Points between voltage drop is measured (Figure 110)		P
	Test sequence for all types conductors (see Table 116)		P
	Verification of temperature rise (see 8.3.4.1) (see figure 110)		P
8.10.3	Acceptability of test results		P
8.10.3.1	Contacts		P
	Limit value after 250 th cycle $\leq 15\%$		P
	Limit value after 500 th cycle $\leq 30\%$		P
	Limit value after 750 th cycle $\leq 40\%$		P
	Difference between last and first measurement of temperature rise less than 20 K		P
8.10.3.2	Direct terminal clamps		P
	Permissible tolerance for resistance R_{cl0} for Al conductors : $R_{cl0\ max} \leq 2 R_{cl0\ min}$		P
	Permissible changes of the resistance from $R_{cl\ 50}$ to $R_{cl\ 750}$: see Table 117		P
	Copper or cleaned aluminium conductors		P
	Uncleaned aluminium conductors		N/A
	Change from 50 th to 250 th cycle		P
	Change after 250 th to 500 th cycle		P
	Change after 500 th to 750 th cycle		P
	Change between 50 th to 750 th cycle		P
	Temperature rise at test spot F < 75K		P
8.11	Mechanical and miscellaneous tests		P
8.11.1.1	Mechanical strength of fuse-holders		P
	Test set-up subjected to temperature rise test at rated current	250A	P

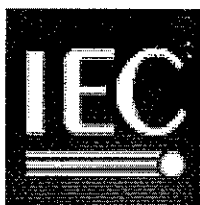
IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	fuse-link or fuse-carrier are withdrawn and inserted into fuse-base 100 times	100 times	—
	All parts are intact and function normally		P
	Test set-up subjected to further temperature rise test at rated current (values obtained are not more than 5 K or 15 % above the values from temperature-rise test prior).....	Max. 43K	P
8.11.1.2	Mechanical strength of the fuse-base		P
	Test-link inserted three times in the fuse-base : (Dimensions of blade contacts see Figure 101) (Withdrawal force F lied within limits in Table 118)		P
	Steel screws are fastened three times at the terminals, torque of 1,2 times value specified by manufacturer or value of Table 111		P
	Contact pieces not have moved to affect the further use		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.11.1.8	Impact resistance of gripping-lugs of moulded material or of metal fixed in moulded material		N/A
8.11.1.8.1	Test arrangement		N/A
8.11.1.8.2	Facility is given in Figure 109		N/A
	One fuse-link ... $(150 \pm 5)^{\circ}\text{C}$ for 168 h		—
	Another one -15°C for 72 h		—
	One impact on each of gripping-lugs		N/A
8.11.1.8.3	Acceptability of test results		N/A
	No damage capable of hindering their further use		N/A
	No bent out by more than 3 mm		N/A
	Coupling with a handle (Figure 103) not are hindered		N/A
8.11.2.3	Verification of resistance to rusting		N/A
8.11.2.3.1	According to ISO 6988 cyclic moist atmosphere containing 0,2% SO ₂ (SFW 0,2 S) for 1 cycle		N/A
8.11.2.3.2	Optional test (severe environmental conditions)		N/A

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse-links and fuse-bases for used in environment of pollution degree ≥ 3 tested with SFW 2,0 S for 5 cycles		N/A
	They marked accordingly		N/A
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base		P
8.11.2.4.1	Test method		P
	Period 168 h	168	—
	for equipment comprising moulded elements to support live parts $(150\pm 5)^{\circ}\text{C}$	150	—
	for covers $(100\pm 5)^{\circ}\text{C}$		—
	Period greater than 1 h	1h	—
	for sealing compounds; stability of marking $(150\pm 5)^{\circ}\text{C}$		—
	After cooling to ambient temperature the following are tested.		P
	Fuse-links: breaking capacity with I_1 and I_2		P
	Fuse-base: mechanical strength in accordance with 8.11.1.2		P
8.11.1.2	Mechanical strength of the fuse-base		P
	Test-link inserted three times in the fuse-base : (Dimensions of blade contacts see Figure 101) (Withdrawal force F lied within limits in Table 118)		P
	Steel screws are fastened three times at the terminals, torque of 1,2 times value specified by manufacturer or value of Table 111		P
	Contact pieces not have moved to affect the further use		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.11.2.4.2	Acceptability of test results		P
	Not have changed of positions of fuse-base contacts to correct functioning		P
	No fracture nor any signs of fracture on insulating body with terminals		P
	Mechanical strength of cemented joints not impaired		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sealing compounds not shifted to extent permitting live parts to exposed		P
	Fuse-links operate correctly		P
	Marking are durable and easily legible		P

Produkte
Products

Prüfbericht - Nr.: 15033142 001 <i>Test Report No.:</i>		Seite 1 von 1 <i>Page 1 of 1</i>	
Auftraggeber: <i>Client:</i>		Wenzhou Jinlida Electrical Co., Ltd. <i>Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604, P.R. China</i>	
Gegenstand der Prüfung: <i>Test item:</i>		Low-voltage Fuse	
Bezeichnung: <i>Identification:</i>	NH2	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	153123295	Eingangsdatum: <i>Date of receipt:</i>	22.06.2009
Prüfört: <i>Testing location:</i>	Hunan Electrical Apparatus Testing Institute <i>4 Xinzhong Road, Changsha, Hunan, P.R. China</i>		
Prüfgrundlage: <i>Test specification:</i>	IEC 60269-1:2006 IEC 60269-2:2006		
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>		
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.		
geprüft/ tested by:		kontrolliert/ reviewed by:	
	Kenny Shi/PE		Bo Xia/Reviewer
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
29.07.2009			30.07.2009
Sonstiges/ Other Aspects:			
This report consists of two parts: Part I for IEC 60269-1:2006. Part II for IEC 60269-2:2006.			
Abkürzungen:	P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet	Abbreviations:	P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			



Test Report issued under the responsibility of:

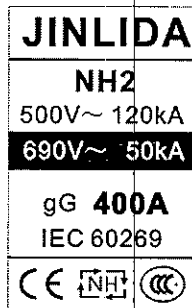


TEST REPORT IEC 60269-1 Low-voltage fuses Part 1: General requirements	
Report Reference No.....	15033142 001 Part I
Date of issue	30.07.2009
Total number of pages	50 pages
Testing Laboratory	TÜV Rheinland (Shanghai) Co., Ltd.
Address	10-15/F, Huatsing Building, No.88, Lane 777, Guangzhong Road West, 200072 Shanghai Zhabei District, P.R. China
Applicant's name.....	Wenzhou Jinlida Electrical Co., Ltd.
Address	Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604 P.R. China
Test specification:	
Standard	IEC 60269-1:2006 (Fourth edition)
Test procedure	CB
Non-standard test method.....	N/A
Test Report Form No.	IEC60269_1A
Test Report Form(s) Originator	EZU
Master TRF	Dated 2009-04
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Test item description	Fuses (fuse-link and fuse-base)
Trade Mark	JINLIDA
Manufacturer	Same as applicant
Model/Type reference	NH2
Ratings	AC 500V; 160A,200A,250A,300A,400A; 120kA; Size 2

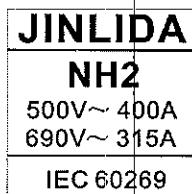
Testing procedure and testing location:	
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address:	TÜV Rheinland (Shanghai) Co., Ltd. Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
<input type="checkbox"/> Associated CB Test Laboratory: Testing location/ address:	
Tested by (name + signature).....: Approved by (+ signature):	
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature):	
Testing location/ address:	
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature).....: Approved by (+ signature):	
Testing location/ address:	
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature):	
Supervised by (+ signature).....: Testing location/ address:	
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature):	
Supervised by (+ signature).....: Testing location/ address:	

Summary of testing:	
Tests performed (name of test and test clause): For homogeneous series of NH2, type tests are listed in table 11, 12, 13 and 14 in EN 60269-1:2006	Testing location: Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
Summary of compliance with National Differences: N/A	

Copy of marking plate:



Marking plate of fuse-link



Marking plate of fuse-base

Test item particulars:	
Fuse-holder	Yes/No
Fuse-base	Yes/No
Fuse-carrier	Yes/No
Fuse-link.....	Yes/No
Fuse for use by authorized persons	Yes/No
Fuse for use by unskilled persons	Yes/No
.....:	
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	06.2009
Date (s) of performance of tests	06.2009-07.2009
General remarks:	
<p>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. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>	
General product information:	
N/A	

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	CHARACTERISTICS OF FUSES		
5.2	Rated voltage (V) as specified	AC 500V	P
5.3.1	Rated current (A) of the fuse-link in accordance with specified values	160A,200A,250A,300A,315A,400A	P
5.3.2	Rated current (A) of the fuse-holder	400A	P
5.4	Rated frequency (Hz)	50Hz	P
5.5	Max. rated power dissipation (VA) of fuse-link	<=34W	P
	Rated acceptable power dissipation (VA) of fuse-holder	45W	P
5.6	Limits of time-current characteristics based on reference ambient air temperature Ta of +20°C		P
5.6.1	Time-current zones deviated from standardized, or available in manufacturers documentation (with tolerances)		P
5.6.2	Conventional times and currents see Table 2		P
5.6.3	Gates		P
5.7	Breaking range and breaking capacity	120kA	P
5.7.1	Breaking range and utilization category	gG	P
5.7.2	Rated breaking capacity (A) of fuse-link corresponds to the rated voltage (V), and is equal or higher than given minimum (A) in subsequent part of this standard	120kA	P
5.8	Cut-off current and I ² t characteristics are referred to the values of voltage, frequency and power factor		P
5.8.1	Cut-off current characteristics, if required, given by the manufacturer according to Figure 4		P
5.8.2	Pre-arcing I ² t characteristics for pre-arcing times of less than 0,1 s down to a time corresponding to the rated breaking capacity given by the manufacturer :		P
	The operating I ² t characteristics with specified voltages as parameter for pre-arcing times less than 0,1 s given by the manufacturer		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
6	MARKINGS		
	Markings are durable and easily legible		P
6.1	Fuse-holders marked by:		P
	- name of manufacturer or trade mark which enable identification of fuse-holder	JINLIDA	P
	- manufacturer's identification reference enabling to find all characteristics listed in 5.1.1	NH2	P
	- rated voltage (V)	500V	P
	- rated current (A)	400A	P
	- kind of current and rated frequency (Hz)	AC and 50Hz	P
6.2	Fuse-link(s) except small fuse-link(s) marked by:		P
	- name of manufacturer or trade mark which enable identification of fuse-links	JINLIDA	P
	- manufacturer's identification reference enabling to find all characteristics listed in 5.1.2	NH2	P
	- rated voltage (V)	500V	P
	- rated current (A)	160~400A	P
	- breaking range and utilization category (if applicable) (5.7.1)	gG	P
	- kind of current	AC	P
	- rated frequency (Hz), if applicable (5.4)	50Hz	P
	Small fuse-links marked by:		N/A
	- trademark		N/A
	- list reference of manufacturer		N/A
	- rated voltage (V)		N/A
	- rated current (A)		N/A
6.3	Symbols for the kind of current and frequency in accordance with IEC 60417		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
7	STANDARD CONDITIONS FOR CONSTRUCTION		
7.1	Mechanical design		P
7.1.1	Replacement of fuse-links easily and safely		P
7.1.2	Connections, including terminals		P
	Contact force is not transmitted through insulating material other than ceramic or other material with characteristics not less suitable, unless		P
	there is sufficient resilience in the metallic parts to compensate any possible shrinkage or other deformation of the insulating material		P
	Terminals cannot turn or be displaced when the connecting screws are tightened		P
	Terminals shall be such, that the conductors cannot be displaced		P
	Parts gripping the conductors are of metal		P
	Gripping parts cannot unduly damage conductors		P
	Terminals readily accessible under the intended conditions of installation		P
7.1.3	Fuse-contacts		P
	Fuse-contacts are such that necessary contact force is maintained under the conditions of service and operation		P
	Contact is such that electromagnetic forces occurring during operation under conditions in accordance with 7.5 not impair electrical connections between		P
	a) fuse-base and fuse-carrier		N/A
	b) fuse-carrier and fuse-link		N/A
	c) fuse-link and fuse-base		P
	Fuse contacts are so constructed and of such material that, when fuse is properly installed and service conditions are normal, adequate contact is maintained		P
	a) after repeated engagement and disengagement		P
	b) after being left undisturbed in service for long period		P
7.1.4	Construction of a gauge-piece		P
	Gauge-piece is so designed that it withstands normal stresses occurring during use		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.5	Mechanical strength of fuse-link		P
	Fuse-link have adequate mechanical strength and its contacts are securely fixed		P
7.2	Insulating properties and suitability for isolation		P
	Fuses are such that they do not lose insulating properties at voltages to which they are subjected in normal service		P
	Fuse passes the tests for verification of insulating properties and suitability for isolation in accordance with 8.2		P
7.3	Temperature rise, power dissipation of the fuse-link and acceptable power dissipation of the fuse-holder		P
	See Table 5		P
	Requirements are verified by tests according to 8.3		P
7.4	Operation		P
	Fuse-link is so designed and proportioned that, when tested in its appropriate test arrangement at rated frequency and ambient air temperature of $(20 \pm 5)^\circ\text{C}$		P
	- is able to carry continuously any current not exceeding its rated current		P
	- is able to withstand overload conditions as they may occur in normal service (see 8.4.3.4)		P
	Fuse-link satisfy these conditions if it passes the tests prescribed in 8.4		P
7.5	Breaking capacity		P
	Fuse is capable of breaking, at rated frequency and at voltage not exceeding the recovery voltage specified in 8.5, any circuit having prospective current between		P
	- current I_f (for "g" fuse-links)		P
	- current $k_2 I_n$ (for "a" fuse-links)		N/A
	- for a.c., rated breaking capacity at power factors not lower than those in Table 20		P
	- for d.c., rated breaking capacity at time constants not greater than those limits in Table 21		N/A
	Arc voltage not exceed values given in Table 6.....		P
	Fuse satisfy these conditions if it passes the tests prescribed in 8.5		P
7.6	Cut-off current characteristic		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Values of cut-off current measured as specified in 8.6 are less than, or equal to, the values corresponding to cut-off current characteristics assigned by the manufacturer		P
7.7	I ² t characteristics		P
	Pre-arcing I ² t values verified according to 8.7 (Table 7)		P
	Operating I ² t values verified according to 8.7		P
7.8	Overcurrent discrimination of fuse-links		P
7.9	Protection against electric shock		P
	The degree of protection when the fuse is under normal service conditions:	IP00	P
	The degree of protection when replacing the fuse-link:	IP00	P
	The degree of protection when the fuse-link and fuse-carrier is removed:	IP	N/A
7.9.1	Clearances and creepage distances		P
	Clearances are not less than the values given in Table 9		P
	Creepage distances correspond to material group, as defined in 2.7.1.3 of IEC 60664-1, corresponding with rated voltage given in Table 10	500V	P
7.9.2	Leakage currents of equipment suitable for isolation		N/A
	Value of leakage current (mA) not exceed		N/A
	- 0,5 mA per pole for fuses in new conditions		N/A
	- 2 mA per pole for fuses having been submitted to test according to 8.5		N/A
7.9.3	Additional constructional requirements for fuses with non-separable fuse-carriers, suitable for isolation		N/A
	Fuse-holder are marked with the symbol IEC 60617-S00369		N/A
	When fuse is in open position, with fuse-link remaining inside the fuse-carrier, isolating distance between the fuse contacts in accordance with the isolating function are provided		N/A
	Indication of this position is provided by the position of the fuse-carrier		N/A

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	There exists a locking means in order to lock the fuses in the isolated position, locking is possible only in this position		N/A
	Fuses are designed so that the fuse-carrier remains attached to the fuse-base giving correct indication of the open position, and of locking		N/A
7.10	Resistance to heat		P
	All components are sufficiently resistant to heat which may occur in normal use (see 8.9 and 8.10)		P
7.11	Mechanical strength		P
	All components of fuse are sufficiently resistant to mechanical stresses which may occur in normal use (see 8.3 to 8.5 and 8.11.1)		P
7.12	Resistance to corrosion		P
	All metallic components of fuse are resistant to corrosive influences which may occur in normal use		P
7.12.1	Resistance to rusting		P
	Ferrous components are so protected that they meet relevant tests (see 8.2.4.2 and 8.11.2.3)		P
7.12.2	Resistance to season cracking		P
	Current-carrying parts are sufficiently resistant to season cracking (see 8.2.4.2 and 8.11.2.1)		P
7.13	Resistance to abnormal heat and fire		P
	All components of fuse are sufficiently resistant to abnormal heat and fire (see 8.11.2.2)		P
7.14	Electromagnetic compatibility		N/A
	Fuses within the scope of this standard are not sensitive to normal electromagnetic disturbances		N/A
	No immunity tests are required		N/A

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
8	TESTS		
8.1.2	At the beginning of each test, the fuse is approximately at the ambient temperature		P
8.1.3	Tests made on fuses in clean and dry condition		P
8.1.4	Arrangement of the fuse and dimensions		P
	Except for degree of protection test (see 8.8), fuse are mounted in free air in draught-free surroundings in the normal operation position and on insulating material of sufficient rigidity		P
	Before tests are started, specified external dimensions are measured and results compared with dimensions specified in the relevant data sheet of the manufacturer or specified in subsequent parts	Part II	P
8.1.5	Testing of fuse-links		P
	Fuse-links tested with the kind(s) of current for which they are rated		P
	Fuse-links tested for a.c. with frequency for which they are rated		P
8.1.5.1	Complete tests		P
	Internal resistance R measured by a current $\leq 0,1 I_n$		P
	Measuring current (A) :		P
	Ambient air temperature in range of $20 \pm 5 \text{ }^\circ\text{C}$		P
	The values of resistance	(see appended table)	P
8.1.5.2	Testing of fuse-links of a homogeneous series		P
	Fuse-links tested like a homogeneous series :	Yes/No	P
	If yes: fuse-links have identical enclosures in form and construction (except of fuse-elements and contacts)		P
	- the same arc-extinguishing medium and same completeness of filling		P
	- fuse-elements of identical materials		P
	- their cross-section of fuse-elements not exceed the cross-section of fuse-links having the highest rated current		P
	- number of fuse-elements do not exceed number of fuse-elements of fuse-links with the highest rated current		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- minimum distances between adjacent fuse-elements and between the fuse-elements and the inner surface of the cartridge is not less than those in the fuse-link with the highest rated current		P
	- fuse-links used with a given fuse-holder, or		P
	- fuse-links intended to be used in an arrangement identical for all rated currents of the homogeneous series		N/A
	- value of $R I_n^{3/2}$ does not exceed the value for the fuse-link with largest rated current of the homogeneous series (R measured as indicated in 8.1.5.1)		N/A
	the rated breaking capacity of fuse-links not greater than that of the fuse-link with the largest rated current within the homogeneous series		P
	- if not, the fuse-links with greater breaking capacity subjected to tests no. 1 and no. 2		N/A
	The fuse-link having the largest rated current tested completely according to Table 11		P
	The fuse-link having the smallest rated current tested only according to Table 12		P
	The fuse-links between the largest and smallest rated current tested according to Table 13		P
8.1.6	Testing of fuse-holders		P
	The fuse-holders are subjected to the tests according to Table 14		P
8.2	Verification of the insulating properties and of the suitability for isolation		P
8.2.1	Arrangement of the fuse-holder		P
	The fuse-holder fitted with a fuse-links of the largest dimensions for the type of fuse-holder concerned		P
	The fuse-base fixed to a metal plate, unless otherwise specified		P
	Fuse-link is replace while live - surfaces of fuse-link, of device for replacing it or of fuse-carrier, if of insulating material, are provided with metal coverings connected during tests to the frame of the apparatus; if of metal, they are connected direct to the frame		P
8.2.2	Verification of the insulating properties		P
	Points of application of the test voltage		P
	The test voltage is applied between:		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	a) live parts and the frame with the fuse-link and the device for replacing it, or		P
	the fuse-carrier, if any, in position		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		P
	b) the terminals without fuse-link, device for replacing or the fuse-carrier		P
	no breakdown of insulation or flashover during 1 min of the applying test voltage		P
	c) live parts of different polarity in the case of multipole fuse-holder with fuse-links, fuse-carrier(s) or device(s) for replacing the fuse-links		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		N/A
	d) live parts which in the case of a multipole fuse-holder reach different potential after the fuse-link operates (equipped by fuse-carrier or device for replacing without fuse-link)		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		N/A
	The r.m.s. value of test voltage (V) as specified in Table 15	1890V	P
8.2.2.3.2	Fuse-holder is subjected to humid atmospheric conditions		P
	Relative humidity of ambient air (%)	91-95	P
	Ambient air temperature (°C)	20-30	P
	Duration of treatment (h)	144	P
	Insulation resistance is measured between the points prescribed in 8.2.2.1 by applying d.c. voltage of approximately 500 V		P
	Points of measuring:		P
	a) min. measured value (MΩ)	200MΩ	P
	b) min. measured value (MΩ)	200MΩ	P
	c) min. measured value (MΩ)		N/A
	d) min. measured value (MΩ)		N/A
	The insulation resistance not less than MΩ	1MΩ	P
8.2.3	Verification of the suitability for isolation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Clearances larger than values given in Table 9 are verified by dimensional measurement or by voltage test		N/A
	Points of application of the test voltage		N/A
	The test voltage is applied between:		N/A
	- terminals when the fuse-link and device for replacing it, are removed		N/A
	Test voltage (kV) for verification of the rated impulse withstand voltage is given in Table 16	kV	N/A
	The 1,2/50 μ s impulse voltage applied 5 times for each polarity at intervals of 1 s minimum		N/A
	no breakdown of insulation or flashover during of the applying test voltage		N/A
	no disruptive discharge during the test		N/A
8.2.4.2	Fuse-holder is subjected to humid atmospheric conditions		N/A
	Relative humidity of ambient air (%)		N/A
	Ambient air temperature ($^{\circ}$ C)		N/A
	Duration of treatment (h)		N/A
	Insulation resistance is measured between the points prescribed in 8.2.2.1 by applying d.c. voltage of approximately 500 V		N/A
	Points of measuring:		N/A
	a) min. measured value (M Ω)		N/A
	b) min. measured value (M Ω)		N/A
	c) min. measured value (M Ω)		N/A
	d) min. measured value (M Ω)		N/A
	The insulation resistance not less than 1 M Ω		N/A
8.3	Verification of temperature rise and power dissipation		P
8.3.1	One fuse used for test (unless otherwise stated by the manufacturer) mounted in free air		P
	Test performed at an ambient air temperature of (20 \pm 5) $^{\circ}$ C		P
	Ambient air temperature during the test ($^{\circ}$ C)		P
	Cross-sectional area (see Table17) (mm ² or mm x mm)	240 mm ²	-

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Clause	Requirement + Test	Result - Remark	Verdict
	Tightened by torque; torque (Nm)	32Nm	-
8.3.2	The temperature of the fuse measured by method of measuring	Thermocouple	P
8.3.3	Measurement of the power dissipation of the fuse-link		P
	One fuse used for test (unless otherwise stated by the manufacturer) mounted in free air		P
	Test performed at an ambient air temperature of (20±5) °C		P
	Ambient air temperature during the test (°C)	20°C	P
	Cross-sectional area (see Table17) (mm ² or mm x mm)	240 mm ²	-
	Tightened by torque; torque (Nm)	32Nm	-
8.3.4.1	Temperature rise of the fuse-holder		P
	Applied a.c. current (A) for test equal to the rated current of the fuse-holder	400A	P
	Test made with fuse-link (A), or	400A	P
	with a dummy fuse-link specified in subsequent parts	Part II	P
	Temperature rise limits T for contacts and terminals (Table 5):		P
	spring loaded contacts; limit (K)	unenclosed / enclosed max. 43K<65K	P
	bolted contacts; limit (K)	unenclosed / enclosed	N/A
	terminals; limit (K)	unenclosed / enclosed max. 44K<65K	P
8.3.4.2	Power dissipation of a fuse-link		P
	The test made with a.c. at the current (A) equal to the rated current of the fuse-link	400A	P
	The points of measuring	Central of blade	P
	Measured value of power (W) dissipation in limits (W) specified in subsequent parts	30,6W<34W	P
8.3.5	The acceptable power dissipation (W) of fuse-holder not less than the rated power dissipation of the corresponding fuse-links		P
	After the tests prescribed in 8.3, the insulating parts of the fuse-holders cooled down to ambient temperature withstood the test voltage according to 8.2	1890V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No deformation after tests of 8.3		P
8.4	Verification of operation	For 400A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	240	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I_{nf}) (see Table 2)	500A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I_f) (see Table 2)	640A	-
	the fuse-link operated within the conventional time of (minutes) (Table 2)	2352s	P
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	3h	P
	Off-period of 0,1 of the conventional time	18min	P
	Test current (A) equal to 1,05 of the rated current . :	420A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I_{nf}) (see Table 2)	500A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
8.4	Verification of operation	For 315A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	185	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	393,8A	–
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		–
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	3h	P
	Off-period of 0,1 of the conventional time	18min	P
	Test current (A) equal to 1,05 of the rated current . :	330,8A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	393,8A	–
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
8.4	Verification of operation	For 300A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	185	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	375A	–
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		–
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P

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Clause	Requirement + Test	Result - Remark	Verdict
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h) :	3h	P
	Off-period of 0,1 of the conventional time :	18min	P
	Test current (A) equal to 1,05 of the rated current . :	315A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	375A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2) :	3h	P
8.4	Verification of operation	For 250A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17 :	120	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	312,5A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2) :	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2) :		-
	the fuse-link operated within the conventional time of (minutes) (Table 2) :		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h) :	3h	P
	Off-period of 0,1 of the conventional time :	18min	P
	Test current (A) equal to 1,05 of the rated current . :	262,5A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2) :	312,5A	-

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Clause	Requirement + Test	Result - Remark	Verdict
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
8.4	Verification of operation	For 200A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	95	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	250A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	3h	P
	Off-period of 0,1 of the conventional time	18min	P
	Test current (A) equal to 1,05 of the rated current . :	210A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	250A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
8.4	Verification of operation	For 160A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	70	P
8.4.2	Ambient air temperature during test within (20±5) °C		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	200A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)	256	-
	the fuse-link operated within the conventional time of (minutes) (Table 2)	1056s	P
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	2h	P
	Off-period of 0,1 of the conventional time	12min	P
	Test current (A) equal to 1,05 of the rated current . :	168A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	200A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	2h	P
8.4.3.3	Verification of time-current characteristics and gates		P
8.4.3.3.1	The time-current characteristics verified on the basis of the test according to 8.5		P
	Values of pre-arcing and operating times within the time-current zones:		P
	- indicated by the manufacturer		N/A
	- specified in subsequent parts	Part II	P
	Verification for smaller current ratings, if only one largest rated current fuse-link is subjected to the test according to 8.5 (in case of homogeneous series):		N/A
	"g" fuse-links (except "gD", "gG" and "gM")		N/A
	Tests made in connection with verification of the gates (see 8.4.3.3.2)		N/A
	Ambient air temperature within (20±5) °C		N/A
	rated current I _n (A) of the fuse-link		-
	test performed at voltage (V)		-

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Clause	Requirement + Test	Result - Remark	Verdict
	test 3a) prospective current (A) equal to kI_n ($10 \leq k \leq 20$)		N/A
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
	test 4a) prospective current (A) equal to kI_n ($5 \leq k \leq 8$)		N/A
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
	test 5a) prospective current (A) equal to kI_n ($2,5 \leq k \leq 4$)		N/A
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
	Verification for smaller current ratings, if only one largest rated current fuse-link is subjected to the test according to 8.5 (in case of homogeneous series):		N/A
	"a" fuse-links		N/A
	Ambient air temperature within $(20 \pm 5)^\circ\text{C}$		N/A
	rated current I_n (A) of the fuse-link		—
	test performed at voltage (V)		—
	test 3a) prospective current (A) equal to $nk_2 I_n$ ($5 \leq n \leq 8$)		N/A
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
	test 4a) prospective current (A) equal to $nk_2 I_n$ ($2 \leq n \leq 3$)		N/A
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
	test 5a) prospective current (A) equal to $nk_2 I_n$ ($1 \leq n \leq 1,5$)		N/A
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	400	—
	test performed at voltage (V)	Not specified	—

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Clause	Requirement + Test	Result - Remark	Verdict
	a) testing current (A); pre-arcing time (s) higher than 10 s	1420A;68s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	2840A;2,3s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	4500A;690ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	8060A;8ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	315	-
	test performed at voltage (V)	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s	1050A;74s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	2200A;2,5s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	3420A;780ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	6000A;9ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-
	test performed at voltage (V)		-

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Clause	Requirement + Test	Result - Remark	Verdict
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		-
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	300	-
	test performed at voltage (V) :	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s :	1050A;83s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	2200A;2,9s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	3420A;810ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	6000A;10ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		-
	test performed at voltage (V) :		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		-
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P

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Clause	Requirement + Test	Result - Remark	Verdict
	rated current of the fuse-link (A)..... :	250	–
	test performed at voltage (V) :	Not specified	–
	a) testing current (A); pre-arcing time (s) higher than 10 s :	750A;71s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	1650A;2,5s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	2590A;760ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	4500A;9ms	P
	“aM” fuse-links		N/A
	rated current of the fuse-link (A)..... :		–
	test performed at voltage (V) :		–
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		–
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	“gG” and “gM” fuse-links	“gG” / “gM”	P
	rated current of the fuse-link (A)..... :	200	–
	test performed at voltage (V) :	Not specified	–
	a) testing current (A); pre-arcing time (s) higher than 10 s :	610A;78s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	1250A;2,4s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	1910A;730ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	3420A;10ms	P
	“aM” fuse-links		N/A
	rated current of the fuse-link (A)..... :		–

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Clause	Requirement + Test	Result - Remark	Verdict
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm).....		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A).....	160	-
	test performed at voltage (V)	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s	460A;77s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	950A;2,7s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	1450A;690ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	2590A;9ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A).....		-
	test performed at voltage (V)		-
	Cross-sectional area (see Table18) (mm ² or mm x mm).....		-
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.4	Overload	For 160A and 400A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	The test arrangement is same as that for the temperature rise test (see 8.3.1)		P
	Three fuse-links submitted to 50 pulses having the same duration and test current		P
	test performed at voltage (V)	Not specified	
	"g" fuse-links:		P
	test current (A) equal to 0,8 times the current stated for a pre-arcing time of 5 s	464A/1280A	P
	duration of each pulse 5 s		P
	time (s) interval between pulses equal to 20 % of the conventional time (s) specified in Table 2	24min/36min	P
	"a" fuse-links:		N/A
	rated current I_n (A) of fuse-link		N/A
	test current (A) equal to $k_1 I_n \pm 2\%$		N/A
	the pulse duration (s) corresponds to that indicated on the overload curve for $k_1 I_n$ stated by manufacturer		N/A
	time (s) intervals between pulses equal to 30 times the pulse duration		N/A
	fuse-links having ambient air temperature subjected to a current (A) equal to current for the overload test	464A/1280A	P
	pre-arcing time (s) of sample lies within the manufacturers time-current zone	1) 54s/64,9s 2) 58s/46,3s 3) 62s/57,2s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	95	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	200A	P
	for a time (h) equal to the conventional time	3h	P
	test current increased to 1,45 I_z (A) (I_z specified in Table 19)	308,9A	P
	the fuse-link operated in time (s) less than the conventional time (s)	2925s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	fuse-link mounted as specified in 8.4.1		P
	provided with PVC insulated copper conductors of cross-sectional area (mm ²) (see Table 19)	70	P
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link	160A	P
	for a time (h) equal to the conventional time	2h	P
	test current increased to 1,45 I _z (A) (I _z specified in Table 19)	243,6A	P
	the fuse-link operated in time (s) less than the conventional time (s)	3205s	P
8.4.3.6	Operation of indicating devices and strikers, if any		P
	Operation of indicating device verified in combination with the verification of breaking capacity (see 8.5.5)		P
	The verification of striker operation:		N/A
	"g" fuse-link tested at current (A) equal to current I ₄ (see Table 20 and 21)		N/A
	recovery voltage (V)		N/A
	stated recovery voltage (V)		N/A
	"a" fuse-link tested at current (A) equal to current 2k ₁ I _n (A) (see Figure 2)		N/A
	recovery voltage (V)		N/A
	stated recovery voltage (V)		N/A
	Striker operate during all tests made at recovery voltage of at least 20 V		N/A
	No failure of indicating device or striker		P
8.5	Verification of the breaking capacity		P
8.5.1	The test arrangements as specified in 8.1.4		P
8.5.2	Characteristics of the test circuit as specified		P
	Scheme of test circuit (see Figure 5)		P
	Deviations form specified characteristics of test circuit		P
8.5.3	Measuring instruments		P
8.5.4	Calibration of test circuit		P
	Calibration oscillograms and their evaluation		P
8.5.6	The breaking-capacity tests made at an ambient air temperature of (20 ± 5) °C		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Breaking-capacity tests on a.c. fuses		P
8.5.5.1	Table 20, test No. 1 for "g" and "a" fuse-links	For 160A	P
	Rated breaking capacity of the fuse-links (kA), at voltage (V)	120kA,500VAC	-
	Rated current (A) of the fuse-links	160A	P
	Prospective current I _p (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%	120kA	P
	Power factor	0,20	P
	Initiation of arcing after voltage zero: within 40° - 65° for sample 1 and within 65° - 90° for sample 2 and 3, or	1) 58,0 2) 76,0 3) 80,0	P
	for sample 1) arcing after voltage zero within 0° + 10°, - 0°		N/A
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568V 2) 568V 3) 568V	P
	Cut-off current (A)	1) 23,0kA 2) 22,0kA 3) 24,0kA	P
8.5.8	Acceptability of No. 1 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	900,0V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 50 2) 60 3) 50	P
8.5.5.1	Table 20, test No. 1 for "g" and "a" fuse-links	For 400A	P
	Rated breaking capacity of the fuse-links (kA), at voltage (V)	120kA,500VAC	-

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A) of the fuse-links	400A	P
	Prospective current I ₁ (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%	120kA	P
	Power factor	0,20	P
	Initiation of arcing after voltage zero: within 40° - 65° for sample 1 and within 65° - 90° for sample 2 and 3, or	1) 48,0 2) 88,0 3) 78,0	P
	for sample 1) arcing after voltage zero within 0° + 10°, - 0°		N/A
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568V 2) 568V 3) 568V	P
	Cut-off current (A)	1) 47kA 2) 48kA 3) 49kA	P
8.5.8	Acceptability of No. 1 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	950,0V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 50 2) 40 3) 60	P
8.5.5.1	Table 20, test No. 2 for "g" and "a" fuse-links		P
	Prospective current I ₂ (kA)	25,00kA	P
	Test made under conditions which approximate those giving maximum arc energy		P
	Power factor	0,18	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making angle after voltage zero: within tolerance 0° + 20°, - 0°	1) 3,0 2) 6,0 3) 8,0	P
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568 2) 568 3) 568	P
	Recovery voltage maintained at a value (V); duration (s) for sample (No.)		P
	For other samples duration 15 s (8.5.5.2)		P
8.5.8	Acceptability of No. 2 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	900,0V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 70 2) 80 3) 90	P
8.5.5.1	Table 20, test No. 2* for "g" and "a" fuse-links, for $I_2 \geq I_1$	(see appended table)	N/A
	Prospective current I_2 (kA) for test No. 2 greater than the rated breaking capacity (kA)		N/A
	Test made on six samples replacing tests of Nos. 1 and 2. Test made with current I_1 (kA)		N/A
	Making angels differ approximately 30° between each test		N/A
	Power factor		N/A
8.5.8	Acceptability of No. 2 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
8.5.5.1	Table 20, test No. 3 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_3 (A) equal to $3,2 I_f$	2100A	P
	Prospective current for "a" fuse-link I_3 (A) equal to $2,5 k_{2,n}$		N/A
	Power factor	0,45	P
	Tolerance on current $\pm 20\%$		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2)		P
8.5.8	Acceptability of No. 3 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 15 2) 3)	P
8.5.5.1	Table 20, test No. 4 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_4 (A) equal to $2,0 I_f$	1300A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current for "a" fuse-link I_4 (A) equal to $1,6 k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current + 20%, - 0%		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2) :		P
8.5.8	Acceptability of No. 4 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 20 2) 3)	P
8.5.5.1	Table 20, test No. 5 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_5 (A) equal to $1,25 I_f$	820A	P
	Prospective current for "a" fuse-link I_5 (A) equal to $k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current + 20%, - 0%		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2) :		P
8.5.8	Acceptability of No. 5 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P

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Clause	Requirement + Test	Result - Remark	Verdict
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 30 2) 3)	P
	Breaking-capacity tests on d.c. fuses		N/A
8.5.5.1	Table 21, d.c.test No. 1 for "g" and "a" fuse-links		N/A
	Rated breaking d.c. capacity of the fuse-links (kA), at voltage (V)		
	Rated current (A) of the fuse-links		N/A
	Rated voltage (V) of the fuse-links		N/A
	Prospective current I ₁ (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 1 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.5.1	Table 21, d.c.test No. 2 for "g" and "a" fuse-links		N/A
	a) During test No. 1 arcing commences at a current $\geq 0,5 I_1$, test No. 2 was not performed		N/A
	b) Prospective current I_2 (A). Test made under conditions which approximate those giving maximum arc energy		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	
	Value of recovery voltage: voltage (V) within tolerances $115 + 5\%$, $- 9\%$ of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 2 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 3 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A)		
	Prospective current I_3 (A) equal to $3,2 I_f$		N/A
	Tolerance on current (%) $\pm 20\%$		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	

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Clause	Requirement + Test	Result - Remark	Verdict
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 3 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 4 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A)		—
	Prospective current I ₄ (A) equal to 2,0 I _f		N/A
	Tolerance on current (%) + 20%, - 0%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	—
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 4 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 5 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A)		-
	Prospective current I _s (A) equal to 1,25 I _f		N/A
	Tolerance on current (%) + 20%, - 0%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 5 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.6	Verification of the cut-off current characteristics		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.6.2	The values measured did not exceed cut-off characteristics indicated by the manufacturer (see 5.8.1)		P
8.7	Verification of I^2t characteristics and overcurrent discrimination		P
8.7.2	The operating I^2t values measured not exceed the values indicated by the manufacturer, or		P
	those specified in subsequent parts		P
	The pre-arcing I^2t values not less than minimum pre-arcing values given by the manufacturer, or		N/A
	they lie within the limits indicated in Table 7		P
8.7.3	Verification of compliance for fuse-links at 0,01 s		P
	"gG" and "gM" fuse-links at 0,01 s comply with Table 7		P
8.7.4	Verification of overcurrent discrimination		P
	The discrimination of the fuse-links verified by means of the time-current characteristics and the pre-arcing and operating I^2t values		P
8.8	Verification of the degree of protection of enclosures		P
	Degree of protection IP : IP00		P
	Verification by test under conditions specified in IEC 60529 :		P
8.9	Verification of resistance to heat		P
	No damage impaired by heat during the previous tests (in particular with respect to 8.3, 8.4, 8.5 and 8.10)		P
8.10	Verification of non-deterioration of contacts		P
8.10.1	Three samples provided with standardized dummy fuse-links of the highest current rating (A) intended to be used in the fuse-holder (see subsequent parts) :		P
8.10.2	Test current (A) for load period : 500A		P
	Duration (s) of load period : 0,75h		P
	Duration (s) of no-load period : 0,3h		P
	a) Test of 250 cycles, measured values not exceed the limits given in subsequent parts		P
	b) Test of 750 cycles, measured values not exceed the limits given in subsequent parts		P
8.11	Mechanical and miscellaneous tests		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.11.1	Mechanical strength		P
	Mechanical characteristics of fuse and its parts judged in the context of normal handling and mounting as well as with results shown after breaking-capacity test (see 8.5), if not otherwise specified in the subsequent parts		P
8.11.2	Miscellaneous tests		P
8.11.2.1	Verification of freedom from season cracking		P
	Current-carrying parts made of rolled copper alloy with less than 83% copper content and with all grease removed, placed for 4 h in test cabinet having temperature of $(30 \pm 10) ^\circ\text{C}$		P
	After this, samples placed for 8 h in test cabinet, on the bottom of which is ammonium chloride solution having pH value 10 - 11		P
	After test no cracks visible to the unaided eye		P
8.11.2.2	Verification of resistance to abnormal heat and fire		P
8.11.2.2.1	Parts of insulating material, except ceramic, have a limited duration of burning without spreading fire by flames or burning droplets or glowing particles falling from the specimen		P
8.11.2.2.5	Glow-wire test: $(650 \pm 10) ^\circ\text{C}$		N/A
	Parts of insulating materials not necessary to retain current-carrying parts in position even though they are in contact with them, made the glow-wire test $(650 \pm 10) ^\circ\text{C}$		N/A
	No visible flame, or burning or glowing of the specimen extinguish within max. (s) after removal of the glow-wire. Limit $(30 \pm 1) \text{ s}$		N/A
	No burning of the tissue paper		N/A
	No scorching of the pinewood board		N/A
	Glow-wire test: $(960 \pm 10) ^\circ\text{C}$	No flame	P
	Parts of insulating materials necessary to retain current-carrying parts and parts of the earthing circuit, if any, in position, made the glow-wire test $(960 \pm 10) ^\circ\text{C}$		P
	No visible flame, or burning or glowing of the specimen extinguish within max. (s) after removal of the glow-wire. Limit $(30 \pm 1) \text{ s}$		P
	No burning of the tissue paper		P

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Clause	Requirement + Test	Result - Remark	Verdict
	No scorching of the pinewood board		P
8.11.2.3	Verification of resistance to rusting		P
	Tested parts after degreasing (10 min in specified solution) placed for 10 min in air saturated with moisture and after that dried 10 min in an ambient temperature (100 ± 5) °C		P
	Surface of tested parts show no signs of rust		P

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Clause	Requirement + Test	Result - Remark	Verdict

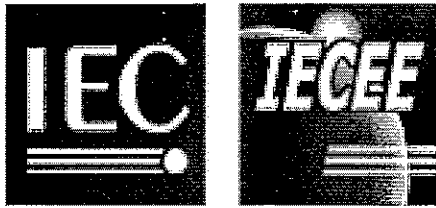
APPENDIX 1

8.1.5.1	TABLE: Internal resistance of the fuse-links												P
	a) rated current (A) of the fuse-link :											160	—
	measuring current (A) :											16	—
	ambient air temperature (°C) :											25	—
internal resistance	sample No.												
	1	2	3	4	5	6	7	8	9	10	11	12	
R (mΩ)	0,377	0,383	0,384	0,386	0,385	0,392	0,393	0,383	0,394	0,386	0,389	0,391	
internal resistance	sample No.												
	13												
R (mΩ)	0,383												
	b) rated current (A) of the fuse-link :											200	—
	measuring current (A) :											20	—
	ambient air temperature (°C) :											25	—
internal resistance	sample No.												
	1	2	3	4	5	6							
R (mΩ)	0,310	0,318	0,311	0,310	0,319	0,308							
	c) rated current (A) of the fuse-link :											250	—
	measuring current (A) :											25	—
	ambient air temperature (°C) :											25	—
internal resistance	sample No.												
	1	2	3	4	5								
R (mΩ)	0,234	0,230	0,235	0,236	0,235								
	c) rated current (A) of the fuse-link :											300	—
	measuring current (A) :											30	—
	ambient air temperature (°C) :											25	—
internal resistance	sample No.												
	1	2	3	4	5								
R (mΩ)	0,192	0,197	0,193	0,201	0,200								
	c) rated current (A) of the fuse-link :											315	—
	measuring current (A) :											31,5	—
	ambient air temperature (°C) :											25	—
internal resistance	sample No.												
	1	2	3	4	5								
R (mΩ)	0,172	0,168	0,169	0,174	0,171								
	c) rated current (A) of the fuse-link :											400	—
	measuring current (A) :											40	—

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Clause	Requirement + Test	Result - Remark	Verdict

		ambient air temperature (°C) :		25								
internal resistance	sample No.											
	1	2	3	4	5	6	7	8	9	10	11	12
R (mΩ)	0,139	0,137	0,138	0,138	0,134	0,140	0,138	0,141	0,132	0,138	0,136	0,137
internal resistance	sample No.											
	13	14	15									
R (mΩ)	0,137	0,136	0,138									

8.5.5.1	TABLE: Table 20, test No. 2* for "g" and "a" fuse-links, for $I_2 \geq I_1$				N/A
sample No.	making angle after voltage zero	recovery voltage		cut off current	resistance between contacts
	(°)	(V)	(%)	(A)	(MΩ)
1					
2					
3					
4					
5					
6					



Test Report issued under the responsibility of:



TEST REPORT IEC 60269-2 Low-voltage fuses Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to I	
Report Reference No.:	15033142 001 Part II
Date of issue	30.07.2009
Total number of pages	18 pages
CB Testing Laboratory	TÜV Rheinland (Shanghai) Co., Ltd.
Address	10-15/F, Huatsing Building, No.88, Lane 777, Guangzhong Road West, 200072 Shanghai Zhabei District, P.R. China
Applicant's name	Wenzhou Jinlida Electrical Co., Ltd.
Address	Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604 P.R. China
Test specification:	
Standard	IEC 60269 - 2 : 2006 (third edition) (see also IEC 60269 – 1:1998)
Test procedure.....	CB
Non-standard test method.....	N/A
Test Report Form No.:	IEC60269_2A
Test Report Form(s) Originator	EZU
Master TRF	Dated 2007-12
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Test item description.....	Fuses(fuse link and fuse base)
Trade Mark	JINLIDA
Manufacturer.....	Same as applicant
Model/Type reference	NH2
Ratings.....	AC 500V; 160A,200A,250A,300A,315A,400A; 120kA; Size 2

Testing procedure and testing location:	
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address.....:	TÜV Rheinland (Shanghai) Co., Ltd. Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
<input type="checkbox"/> Associated CB Test Laboratory: Testing location/ address.....:	
Tested by (name + signature).....: Approved by (+ signature):	
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature): Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature).....: Approved by (+ signature): Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address.....:	

Summary of testing:	
Tests performed (name of test and test clause): For homogeneous series of NH2, type tests are listed in table 11, 12, 13 and 14 in EN 60269-1:2006	Testing location: Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
Summary of compliance with National Differences: N/A	

Copy of marking plate:
Refer to 15033142 001 Part I.

Test item particulars:	
Classification of installation and use.....:	See part I
Supply Connection.....:	See part I
Fuse system.....:	A /B/C/D/E/F/G/H/I
.....:	
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.....:	06.2009
Date (s) of performance of tests.....:	06.2009-07.2009
General remarks:	
<p>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. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>	
General product information:	
N/A	

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
Requirements IEC 60269-1			
FUSE SYSTEM A – FUSES WITH FUSE-LINKS WITH BLADE CONTACTS (NH FUSE SYSTEM)			
5	CHARACTERISTICS OF FUSES		
5.2	Rated voltage (V) as specified	500VAC	P
5.3.1	Rated current (A) of the fuse-link in accordance with specified values		P
5.3.2	Rated current (A) of the fuse-holder and the size of the fuse-link	Size 2	P
5.5	Rated power (W) dissipation of fuse-link see Figure 101	<34W	P
	Rated acceptable power (VA) dissipation of fuse-bases given in Figure 102	45W	P
5.6	Limits of time-current characteristics		P
5.6.1	Time-current characteristics, time-current zones and overload curves		P
5.6.2	Conventional times and current see Table 101 ...:		P
5.6.3	Gates		P
5.7.2	Rated breaking capacity (A).....	120kA	P
6	MARKING		
	Markings are legible		P
6.1	Fuse-holders marked by:		P
	- IEC 60269-2		P
	- size.....	2	P
	Marking of rated current and rated voltage are discernible from the front		P
6.2	Fuse-links marked by:		P
	- IEC 60269-2		P
	- size or reference.....	2	P
	- rated breaking capacity	120kA	P
	Marking of rated current and rated voltage are discernible from the front		P
	Fuse-links are marked as described in Table 104.. :		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
7	STANDARD CONDITIONS FOR CONSTRUCTION		
7.1	Mechanical design		P
	The dimensions of the fuse-links given in Figure 101		P
	Dimensions:		P
	dimension marking a1: prescribed (mm); measured (mm)	150±2,5;	P
	dimension marking a2: prescribed (mm); measured (mm)	75-10;	P
	dimension marking a3: prescribed (mm); measured (mm)	62±2,5;	P
	dimension marking a4: prescribed (mm); measured (mm)	68±2,5;	P
	dimension marking b1min: prescribed (mm); measured (mm)	25;	P
	dimension marking b2min: prescribed (mm); measured (mm)	8;	P
	dimension marking b3max: prescribed (mm); measured (mm)	6;	P
	dimension marking b4min: prescribed (mm); measured (mm)	22;	P
	dimension marking c1: prescribed (mm); measured (mm)	48;	P
	dimension marking c2: prescribed (mm); measured (mm)	11-2;	P
	dimension marking d: prescribed (mm); measured (mm)	2,5+1,5/-0,5	P
	dimension marking e1max: prescribed (mm); measured (mm)	61;	P
	dimension marking e2max: prescribed (mm); measured (mm)	60;	P
	dimension marking e3: prescribed (mm); measured (mm)	20+5/-2;	P
	dimension marking e4: prescribed (mm); measured (mm)	6;	P
	dimension marking f: prescribed (mm); measured (mm)	15;	P
	dimension marking z: prescribed (mm); measured (mm)	5;	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The dimensions of the fuse-base given in Figure 102		P
	Dimensions:		P
	dimension marking g: prescribed (mm); measured (mm)	61 ± 1;	P
	dimension marking h: prescribed (mm); measured (mm)	200 ± 1,5;	P
	dimension marking n1max: prescribed (mm); measured (mm)	60;	P
	dimension marking n2max: prescribed (mm); measured (mm)	68;	P
	dimension marking p1max: prescribed (mm); measured (mm)	60;	P
	dimension marking p2: prescribed (mm); measured (mm)	35;	P
	dimension marking r min: prescribed (mm); measured (mm)	17;	P
	dimension marking s max: prescribed (mm); measured (mm)	46;	P
	dimension marking t min: prescribed (mm); measured (mm)	27;	P
	dimension marking v: prescribed (mm); measured (mm)	80+3;	P
	dimension marking w1: prescribed (mm); measured (mm)	30 ± 0,7;	P
	dimension marking w2: prescribed (mm); measured (mm)	25 ± 0,7;	P
	dimension marking x min: prescribed (mm); measured (mm)	20	P
	dimension marking y: prescribed (mm); measured (mm)	10,5 ± 0,5;	P
	dimension marking z max: prescribed (mm); measured (mm)	5	P
7.1.2	Connections, including terminals cross-sectional ranges (Table 105) torques to be applied (Table 111) (lug terminal)		P
7.1.3	Contact surfaces should be silver plated	Yes / No	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If no test according to 8.10 are passed with dummies described in 8.10.1		P
7.1.5	Dynamic short-circuit withstand shall meet cut-off currents (Table 112)		P
7.1.7	Construction of fuse-link		P
	Blade contacts made of solid material		P
	If any other construction, manufacturer demonstrate that construction adequate		N/A
	Endplates not permitted to protrude radially from insulation body		P
	preferable to insulate the gripping lugs from live parts		P
	Fuse-links has an indicator		P
	Electrically conductive parts of indicator not ejected from the fuse-link during operation		P
7.2	Insulating properties		P
	Creepage distances and clearances of fuses and fuse-accessories meet requirements of IEC 60664-1 for overvoltage category III and pollution degree 3...:		P
7.7	I^2t characteristics		P
	maximum pre-arcing I^2t (Table 7 of IEC 60269-1)		P
	rated currents lower than 16 A (Table 106)		N/A
	maximum operating I^2t for "aM" fuse-links (Table 107) test No. 2 of the largest rated current of each homogeneous series (Table 20 of IEC 60269-1) ...:		N/A
7.8	Overcurrent discrimination of "gG" fuse-links (see 8.7.4, Table 108)		P
7.9	Protection against electric shock		P
	increased by means of partition walls and covers of fuse-contacts		P
	operation by authorized persons, instructed in electrical matters, using replacement handles according to this fuse system		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
8	TESTS		
	IEC 60269-1 applies with the following supplementary requirements		P
8.1.4	Arrangement of fuse and dimensions		P
	Requirements of 7.2 verified on fuse-bases		P
	Creepage distances and clearances of fuse-links according to 7.2 are verified		P
	Clearances verified on fuse-link inserted into model fuse-base according to Figure 111		P
8.1.6	Testing of fuse-holders		P
	In addition to test given in IEC 60269-1 tested according to Table 109		P
8.2.2.1	Points of application of test voltage		P
	In addition to IEC 60269-1 e) between isolated metal gripping-lugs and terminals of test fuse-bases	1890V	P
8.2.3.2	Value of test voltage	Not applicable	N/A
	rated impulse withstand voltage in Table 110		N/A
8.2.3.3	Test method		N/A
	5 impulses of both polarities and of shape 1,2/50 μ s and rated withstand voltage level according to Table 110		N/A
	minimum period between impulses are 1 s		
8.2.4	Acceptability of test results		P
8.2.4.3	No flash-over or puncture shall occur during test ...		P
8.2.5	Resistance to tracking		P
	plastic parts of fuse-links and fuse-bases tested and shall pass at PTI level stated by manufacturer	500M	P
8.3	Verification of temperature rise and power dissipation		P
8.3.1	Arrangement of the fuse		P
	Tightened by torque (Nm)	32	—
8.3.2	Measurement of the temperature rise		P
	Protective covers and fuse-carriers as provided by manufacturer mounted		P
8.3.4.1	Temperature rise of the fuse-holder	See part I	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Dummy (Figure 105) Point at which temperature rise is measured (Figure 106)		P
8.3.4.2	Power dissipation of a fuse-link (Figure 106)	30,6W	P
8.4.3.1	Verification of conventional non-fusing and fusing current	See part I	P
	non-fusing current test – second test specimen are used for b)	See part I	P
8.4.3.5	Conventional cable overload protection test (for “gG” fuse-links only)	See part I	P
	Details of special test are given in Annex A	Not required	N/A
Annex A	Special test for cable overload protection		N/A
	For fuses with $I_n > 16$ A of the sizes 00, 0, 1 and 2. :		N/A
A.1	Arrangement of the fuse		N/A
	Three fuse-links in fuse-bases mounted in a box... :		N/A
	Ambient air temperature outside the fuse box shall be (30^{+5}_0 °C)	°C	N/A
A.2	Test method and acceptability of test results		N/A
	1,13 I_n flowed through the fuse-links for conventional time (see Table 2 of IEC 60269-1)	A for s	N/A
	Non of fuse-links operated		N/A
	Test current raised without interruption within 5 s to 1,45 I_n	A	N/A
	One fuse-link operated within conventional time :		N/A
8.5.5.1	Verification of the peak withstand current of a fuse- base	Not applicable	N/A
	not be carried out , if this has already been verified during the breaking capacity test of fuse-links with the highest rating of the size		N/A
8.5.5.1.1	Arrangement of the fuse		N/A
	single-phase type, 8.5.1 of IEC 60269-1 peak values of the test currents (Table 112)		N/A
	maximum values (see 8.5.5.1.3).....		
	dummy fuse-link (Figure 101)		
8.5.5.1.2	Test method		N/A

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	fuse-base 1 (Figure107) resilient spring travel is limited to elastic range..... : contacts opened up three times..... :		N/A
	fuse-base 2 (see 8.11.1.2) F_{max} according to Table 118		N/A
8.5.5.1.3	Acceptability of test results		N/A
	fuse-links not be ejected		N/A
	no signs of arcing or welding or other damage		N/A
8.5.8	Acceptability of test results		N/A
	Fuse or circuit-breaker not operate during this test		N/A
8.7.4	Verification of overcurrent discrimination		P
	verified by I^2t values evaluated from the recorded test results		P
	Arrangement of the samples as for the breaking capacity test		P
	two samples tested at the r.m.s. prospective test current I , corresponding to minimum pre-arcing I^2t	1) 2)	P
	the other samples tested at the r.m.s. prospective test current I , corresponding to operating I^2t	3) 4)	P
	test voltage (V)		
	The values of I^2t lie within corresponding limits specified in Table 113..... :		P
8.9	Verification of resistance to heat		P
	Tests apply to fuse-link and fuse-base		P
	Fuse-holder with fuse-links having maximum power dissipation are cyclically loaded as pre-treatment... :		P
	After cooling to normal temperature breaking capacity tested at I_1 (see 8.5)..... :	$I_1 = 120kA$	P
	Fuse-links with organic material Fuse-holder with fuse-links having maximum power dissipation are cyclically loaded as pre-treatment....		N/A
	After cooling to normal temperature breaking capacity tested at I_1 and I_5 (see 8.5)..... :	$I_1 =$ $I_5 =$	N/A
8.9.1	Fuse-base		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	test below apply if it is not obvious that components are not affected adversely by given temperature and withdrawal forces		P
8.9.1.1	Test arrangement		P
	Figure 105 and 108		P
	Test se-up in heating chamber		P
8.9.1.2	Test method		P
	Temperature of $(80^{+5}_0)^{\circ}\text{C}$ for 2 h		P
	160% rated current for 2 h..... :	160% $I_n = 640\text{A}$	P
	Test voltage :	50 V	—
	3 min after switching off tensile force F_{\max} (see Table 118) exerted for 15 s	$F_{\max} =$	P
8.9.1.3	Acceptability of test results		P
	Contact pieces not have moved to affect the further use		P
	Dimensions of Figure 102 are considered		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.9.2	Fuse-links with gripping lugs of moulded material or of metal fixed in moulded material	No such part	N/A
8.9.2.1	Test arrangement		N/A
	Figure 108		N/A
8.9.2.2	Test method		N/A
	Temperature of $(80^{+5}_0)^{\circ}\text{C}$ for 2 h		N/A
	150% rated current for conventional time :	A for h	N/A
	Test voltage :	V	—
	3 min after fuse-link operated or conventional time expired tensile force F_{\max} (see Table 118) exerted for 15 s	$F_{\max} =$	N/A
8.9.2.3	Acceptability of test results		N/A
	Gripping lugs remain fully operational		N/A
	Dimensions of Figure 101 (d and c_2) not be exceeded by more than 2 mm		N/A
8.10	Verification of non-deterioration of contacts and direct terminal clamps		P

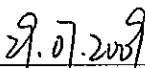
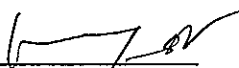
IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.10.1	Arrangement of the fuse		P
	Figure 105		P
	for lug terminals, torque in Table 111..... :	32 Nm	—
	Insulation of conductors removed over the whole length		P
8.10.1.2	Direct terminal clamps		P
	Test performed on 10 direct terminal clamps of five fuse-bases		P
	Distance between fuse-base centres of at least three times e_2 (see Figure 101)		P
	Torque of tightened of screws	Nm	—
	Conductor cross-section	mm ²	—
8.10.2	Test method		P
	Test current (A) for load period	500A	P
	Duration (s) of load period	0,75h	P
	Duration (s) of no-load period	0,3h	P
	Test voltage (V)	50V	—
	a) Test of 50 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	b) Test of 250 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	c) Test of 500 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	d) Test of 750 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
8.10.2.1	Contacts		P
	Points between voltage drop is measured (A and B in Figure 106)		P
	Withdrawal force (Table 118); measured force after 250 cycles (N)	1) 2) 3)	P

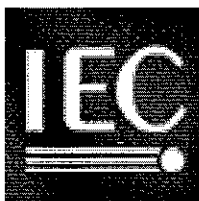
IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Withdrawal force (Table 118); measured force after 750 cycles (N)	1) 2) 3)	P
	If measured values too low, test of 8.5.5.1		N/A
8.10.2.2	Direct terminal clamps		P
	Points between voltage drop is measured (Figure 110)		P
	Test sequence for all types conductors (see Table 116)		P
	Verification of temperature rise (see 8.3.4.1) (see figure 110)		P
8.10.3	Acceptability of test results		P
8.10.3.1	Contacts		P
	Limit value after 250 th cycle $\leq 15\%$		P
	Limit value after 500 th cycle $\leq 30\%$		P
	Limit value after 750 th cycle $\leq 40\%$		P
	Difference between last and first measurement of temperature rise less than 20 K		P
8.10.3.2	Direct terminal clamps		P
	Permissible tolerance for resistance R_{cl0} for Al conductors : $R_{cl0\ max} \leq 2 R_{cl0\ min}$		P
	Permissible changes of the resistance from R_{cl50} to R_{cl750} : see Table 117		P
	Copper or cleaned aluminium conductors		P
	Uncleaned aluminium conductors		N/A
	Change from 50 th to 250 th cycle		P
	Change after 250 th to 500 th cycle		P
	Change after 500 th to 750 th cycle		P
	Change between 50 th to 750 th cycle		P
	Temperature rise at test spot F $< 75K$		P
8.11	Mechanical and miscellaneous tests		P
8.11.1.1	Mechanical strength of fuse-holders		P
	Test set-up subjected to temperature rise test at rated current	400A	P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	fuse-link or fuse-carrier are withdrawn and inserted into fuse-base 100 times	100 times	—
	All parts are intact and function normally		P
	Test set-up subjected to further temperature rise test at rated current (values obtained are not more than 5 K or 15 % above the values from temperature-rise test prior).....	Max. 48K	P
8.11.1.2	Mechanical strength of the fuse-base		P
	Test-link inserted three times in the fuse-base : (Dimensions of blade contacts see Figure 101) (Withdrawal force F lied within limits in Table 118)		P
	Steel screws are fastened three times at the terminals, torque of 1,2 times value specified by manufacturer or value of Table 111		P
	Contact pieces not have moved to affect the further use		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.11.1.8	Impact resistance of gripping-lugs of moulded material or of metal fixed in moulded material		N/A
8.11.1.8.1	Test arrangement		N/A
8.11.1.8.2	Facility is given in Figure 109		N/A
	One fuse-link ... (150±5)°C for 168 h		—
	Another one-15°C for 72 h		—
	One impact on each of gripping-lugs		N/A
8.11.1.8.3	Acceptability of test results		N/A
	No damage capable of hindering their further use		N/A
	No bent out by more than 3 mm		N/A
	Coupling with a handle (Figure 103) not are hindered		N/A
8.11.2.3	Verification of resistance to rusting		N/A
8.11.2.3.1	According to ISO 6988 cyclic moist atmosphere containing 0,2% SO ₂ (SFW 0,2 S) for 1 cycle		N/A
8.11.2.3.2	Optional test (severe environmental conditions)		N/A

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuse-links and fuse-bases for used in environment of pollution degree ≥ 3 tested with SFW 2,0 S for 5 cycles		N/A
	They marked accordingly		N/A
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base		P
8.11.2.4.1	Test method		P
	Period 168 h	168	
	for equipment comprising moulded elements to support live parts $(150\pm 5)^{\circ}\text{C}$	150	
	for covers $(100\pm 5)^{\circ}\text{C}$		
	Period greater than 1 h	1h	
	for sealing compounds; stability of marking $(150\pm 5)^{\circ}\text{C}$		
	After cooling to ambient temperature the following are tested.		P
	Fuse-links: breaking capacity with I_1 and I_2		P
	Fuse-base: mechanical strength in accordance with 8.11.1.2		P
8.11.1.2	Mechanical strength of the fuse-base		P
	Test-link inserted three times in the fuse-base : (Dimensions of blade contacts see Figure 101) (Withdrawal force F lied within limits in Table 118)		P
	Steel screws are fastened three times at the terminals, torque of 1,2 times value specified by manufacturer or value of Table 111		P
	Contact pieces not have moved to affect the further use		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.11.2.4.2	Acceptability of test results		P
	Not have changed of positions of fuse-base contacts to correct functioning		P
	No fracture nor any signs of fracture on insulating body with terminals		P
	Mechanical strength of cemented joints not impaired		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Sealing compounds not shifted to extent permitting live parts to exposed		P
	Fuse-links operate correctly		P
	Marking are durable and easily legible		P

Prüfbericht - Nr.: 15033143 001 <i>Test Report No.:</i>		Seite 1 von 1 <i>Page 1 of 1</i>	
Auftraggeber: <i>Client:</i>		Wenzhou Jinlida Electrical Co., Ltd. <i>Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604, P.R. China</i>	
Gegenstand der Prüfung: <i>Test item:</i>		Low-voltage Fuse	
Bezeichnung: <i>Identification:</i>		Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>		Eingangsdatum: <i>Date of receipt:</i>	22.06.2009
Prüfört: <i>Testing location:</i>		Hunan Electrical Apparatus Testing Institute <i>4 Xinzhong Road, Changsha, Hunan, P.R. China</i>	
Prüfgrundlage: <i>Test specification:</i>		IEC 60269-1:2006 IEC 60269-2:2006	
Prüfergebnis: <i>Test Result:</i>		Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>	
Prüflaboratorium: <i>Testing Laboratory:</i>		TÜV Rheinland (Shanghai) Co., Ltd.	
geprüft/ tested by:		kontrolliert/ reviewed by:	
	Kenny Shi/PE		Bo Xia/Reviewer
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
29.07.2009			30.07.2009
Sonstiges/ Other Aspects:			
This report consists of two parts: Part I for IEC 60269-1:2006. Part II for IEC 60269-2:2006.			
Abkürzungen:		Abbreviations:	
P(ass) = entspricht Prüfgrundlage		P(ass) = passed	
F(ail) = entspricht nicht Prüfgrundlage		F(ail) = failed	
N/A = nicht anwendbar		N/A = not applicable	
N/T = nicht getestet		N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			



Test Report issued under the responsibility of:

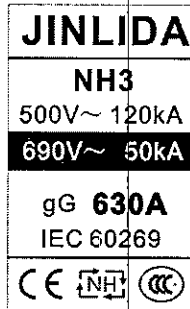


TEST REPORT IEC 60269-1 Low-voltage fuses Part 1: General requirements	
Report Reference No : 15033143 001 Part I Date of issue : 30.07.2009 Total number of pages : 50 pages	
Testing Laboratory : TÜV Rheinland (Shanghai) Co., Ltd. Address : 10-15/F, Huatsing Building, No.88, Lane 777, Guangzhong Road West, 200072 Shanghai Zhabei District, P.R. China	
Applicant's name : Wenzhou Jinlida Electrical Co., Ltd. Address : Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604 P.R. China	
Test specification: Standard : IEC 60269-1:2006 (Fourth edition) Test procedure : CB Non-standard test method : N/A	
Test Report Form No. : IEC60269_1A Test Report Form(s) Originator : EZU Master TRF : Dated 2009-04	
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Test item description : Fuses (fuse-link and fuse-base) Trade Mark : JINLIDA Manufacturer : Same as applicant Model/Type reference : NH3 Ratings : AC 500V; 315A,400A,500A,630A; 120kA; Size 3	

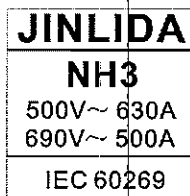
Testing procedure and testing location:	
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address.....:	TÜV Rheinland (Shanghai) Co., Ltd. Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
<input type="checkbox"/> Associated CB Test Laboratory: Testing location/ address.....: Tested by (name + signature).....: Approved by (+ signature):	
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature): Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature).....: Approved by (+ signature): Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address.....:	

Summary of testing:	
Tests performed (name of test and test clause): For homogeneous series of NH3, type tests are listed in table 11, 12, 13 and 14 in EN 60269-1:2006	Testing location: Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
Summary of compliance with National Differences: N/A	

Copy of marking plate:



Marking plate of fuse-link



Marking plate of fuse-base

Test item particulars:	
Fuse-holder	Yes/No
Fuse-base	Yes/No
Fuse-carrier	Yes/No
Fuse-link.....	Yes/No
Fuse for use by authorized persons	Yes/No
Fuse for use by unskilled persons	Yes/No
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	06.2009
Date (s) of performance of tests	06.2009-07.2009
General remarks:	
<p>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. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>	
General product information:	
N/A	

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	CHARACTERISTICS OF FUSES		
5.2	Rated voltage (V) as specified	AC 500V	P
5.3.1	Rated current (A) of the fuse-link in accordance with specified values	315A,400A,500A,630A	P
5.3.2	Rated current (A) of the fuse-holder	400A	P
5.4	Rated frequency (Hz)	50Hz	P
5.5	Max. rated power dissipation (VA) of fuse-link	<=48W	P
	Rated acceptable power dissipation (VA) of fuse-holder	60W	P
5.6	Limits of time-current characteristics based on reference ambient air temperature Ta of +20°C		P
5.6.1	Time-current zones deviated from standardized, or available in manufacturers documentation (with tolerances).....		P
5.6.2	Conventional times and currents see Table 2		P
5.6.3	Gates		P
5.7	Breaking range and breaking capacity	120kA	P
5.7.1	Breaking range and utilization category.....	gG	P
5.7.2	Rated breaking capacity (A) of fuse-link corresponds to the rated voltage (V), and is equal or higher than given minimum (A) in subsequent part of this standard	120kA	P
5.8	Cut-off current and I^2t characteristics are referred to the values of voltage, frequency and power factor		P
5.8.1	Cut-off current characteristics, if required, given by the manufacturer according to Figure 4		P
5.8.2	Pre-arcing I^2t characteristics for pre-arcing times of less than 0,1 s down to a time corresponding to the rated breaking capacity given by the manufacturer :		P
	The operating I^2t characteristics with specified voltages as parameter for pre-arcing times less than 0,1 s given by the manufacturer		P

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Clause	Requirement + Test	Result - Remark	Verdict
6	MARKINGS		
	Markings are durable and easily legible		P
6.1	Fuse-holders marked by:		P
	- name of manufacturer or trade mark which enable identification of fuse-holder	JINLIDA	P
	- manufacturer's identification reference enabling to find all characteristics listed in 5.1.1	NH3	P
	- rated voltage (V)	500V	P
	- rated current (A)	630A	P
	- kind of current and rated frequency (Hz)	AC and 50Hz	P
6.2	Fuse-link(s) except small fuse-link(s) marked by:		P
	- name of manufacturer or trade mark which enable identification of fuse-links	JINLIDA	P
	- manufacturer's identification reference enabling to find all characteristics listed in 5.1.2	NH3	P
	- rated voltage (V)	500V	P
	- rated current (A)	315-630A	P
	- breaking range and utilization category (if applicable) (5.7.1)	gG	P
	- kind of current	AC	P
	- rated frequency (Hz), if applicable (5.4)	50Hz	P
	Small fuse-links marked by:		N/A
	- trademark		N/A
	- list reference of manufacturer		N/A
	- rated voltage (V)		N/A
	- rated current (A)		N/A
6.3	Symbols for the kind of current and frequency in accordance with IEC 60417		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
7	STANDARD CONDITIONS FOR CONSTRUCTION		
7.1	Mechanical design		P
7.1.1	Replacement of fuse-links easily and safely		P
7.1.2	Connections, including terminals		P
	Contact force is not transmitted through insulating material other than ceramic or other material with characteristics not less suitable, unless		P
	there is sufficient resilience in the metallic parts to compensate any possible shrinkage or other deformation of the insulating material		P
	Terminals cannot turn or be displaced when the connecting screws are tightened		P
	Terminals shall be such, that the conductors cannot be displaced		P
	Parts gripping the conductors are of metal		P
	Gripping parts cannot unduly damage conductors		P
	Terminals readily accessible under the intended conditions of installation		P
7.1.3	Fuse-contacts		P
	Fuse-contacts are such that necessary contact force is maintained under the conditions of service and operation		P
	Contact is such that electromagnetic forces occurring during operation under conditions in accordance with 7.5 not impair electrical connections between		P
	a) fuse-base and fuse-carrier		N/A
	b) fuse-carrier and fuse-link		N/A
	c) fuse-link and fuse-base		P
	Fuse contacts are so constructed and of such material that, when fuse is properly installed and service conditions are normal, adequate contact is maintained		P
	a) after repeated engagement and disengagement		P
	b) after being left undisturbed in service for long period		P
7.1.4	Construction of a gauge-piece		P
	Gauge-piece is so designed that it withstands normal stresses occurring during use		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.5	Mechanical strength of fuse-link		P
	Fuse-link have adequate mechanical strength and its contacts are securely fixed		P
7.2	Insulating properties and suitability for isolation		P
	Fuses are such that they do not lose insulating properties at voltages to which they are subjected in normal service		P
	Fuse passes the tests for verification of insulating properties and suitability for isolation in accordance with 8.2		P
7.3	Temperature rise, power dissipation of the fuse-link and acceptable power dissipation of the fuse-holder		P
	See Table 5		P
	Requirements are verified by tests according to 8.3		P
7.4	Operation		P
	Fuse-link is so designed and proportioned that, when tested in its appropriate test arrangement at rated frequency and ambient air temperature of $(20 \pm 5)^\circ\text{C}$		P
	- is able to carry continuously any current not exceeding its rated current		P
	- is able to withstand overload conditions as they may occur in normal service (see 8.4.3.4)		P
	Fuse-link satisfy these conditions if it passes the tests prescribed in 8.4		P
7.5	Breaking capacity		P
	Fuse is capable of breaking, at rated frequency and at voltage not exceeding the recovery voltage specified in 8.5, any circuit having prospective current between		P
	- current I_f (for "g" fuse-links)		P
	- current $k_2 I_n$ (for "a" fuse-links)		N/A
	- for a.c., rated breaking capacity at power factors not lower than those in Table 20		P
	- for d.c., rated breaking capacity at time constants not greater than those limits in Table 21		N/A
	Arc voltage not exceed values given in Table 6.....		P
	Fuse satisfy these conditions if it passes the tests prescribed in 8.5		P
7.6	Cut-off current characteristic		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Values of cut-off current measured as specified in 8.6 are less than, or equal to, the values corresponding to cut-off current characteristics assigned by the manufacturer		P
7.7	I ² t characteristics		P
	Pre-arcing I ² t values verified according to 8.7 (Table 7)		P
	Operating I ² t values verified according to 8.7		P
7.8	Overcurrent discrimination of fuse-links		P
7.9	Protection against electric shock		P
	The degree of protection when the fuse is under normal service conditions:	IP00	P
	The degree of protection when replacing the fuse-link:	IP00	P
	The degree of protection when the fuse-link and fuse-carrier is removed:	IP	N/A
7.9.1	Clearances and creepage distances		P
	Clearances are not less than the values given in Table 9		P
	Creepage distances correspond to material group, as defined in 2.7.1.3 of IEC 60664-1, corresponding with rated voltage given in Table 10	500V	P
7.9.2	Leakage currents of equipment suitable for isolation		N/A
	Value of leakage current (mA) not exceed		N/A
	- 0,5 mA per pole for fuses in new conditions		N/A
	- 2 mA per pole for fuses having been submitted to test according to 8.5		N/A
7.9.3	Additional constructional requirements for fuses with non-separable fuse-carriers, suitable for isolation		N/A
	Fuse-holder are marked with the symbol IEC 60617-S00369		N/A
	When fuse is in open position, with fuse-link remaining inside the fuse-carrier, isolating distance between the fuse contacts in accordance with the isolating function are provided		N/A
	Indication of this position is provided by the position of the fuse-carrier		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	There exists a locking means in order to lock the fuses in the isolated position, locking is possible only in this position		N/A
	Fuses are designed so that the fuse-carrier remains attached to the fuse-base giving correct indication of the open position, and of locking		N/A
7.10	Resistance to heat		P
	All components are sufficiently resistant to heat which may occur in normal use (see 8.9 and 8.10)		P
7.11	Mechanical strength		P
	All components of fuse are sufficiently resistant to mechanical stresses which may occur in normal use (see 8.3 to 8.5 and 8.11.1)		P
7.12	Resistance to corrosion		P
	All metallic components of fuse are resistant to corrosive influences which may occur in normal use		P
7.12.1	Resistance to rusting		P
	Ferrous components are so protected that they meet relevant tests (see 8.2.4.2 and 8.11.2.3)		P
7.12.2	Resistance to season cracking		P
	Current-carrying parts are sufficiently resistant to season cracking (see 8.2.4.2 and 8.11.2.1)		P
7.13	Resistance to abnormal heat and fire		P
	All components of fuse are sufficiently resistant to abnormal heat and fire (see 8.11.2.2)		P
7.14	Electromagnetic compatibility		N/A
	Fuses within the scope of this standard are not sensitive to normal electromagnetic disturbances		N/A
	No immunity tests are required		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8	TESTS		
8.1.2	At the beginning of each test, the fuse is approximately at the ambient temperature		P
8.1.3	Tests made on fuses in clean and dry condition		P
8.1.4	Arrangement of the fuse and dimensions		P
	Except for degree of protection test (see 8.8), fuse are mounted in free air in draught-free surroundings in the normal operation position and on insulating material of sufficient rigidity		P
	Before tests are started, specified external dimensions are measured and results compared with dimensions specified in the relevant data sheet of the manufacturer or specified in subsequent parts	Part II	P
8.1.5	Testing of fuse-links		P
	Fuse-links tested with the kind(s) of current for which they are rated		P
	Fuse-links tested for a.c. with frequency for which they are rated		P
8.1.5.1	Complete tests		P
	Internal resistance R measured by a current $\leq 0,1 I_n$		P
	Measuring current (A)		P
	Ambient air temperature in range of $20 \pm 5 \text{ }^\circ\text{C}$		P
	The values of resistance	(see appended table)	P
8.1.5.2	Testing of fuse-links of a homogeneous series		P
	Fuse-links tested like a homogeneous series	Yes/No	P
	If yes: fuse-links have identical enclosures in form and construction (except of fuse-elements and contacts)		P
	- the same arc-extinguishing medium and same completeness of filling		P
	- fuse-elements of identical materials		P
	- their cross-section of fuse-elements not exceed the cross-section of fuse-links having the highest rated current		P
	- number of fuse-elements do not exceed number of fuse-elements of fuse-links with the highest rated current		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum distances between adjacent fuse-elements and between the fuse-elements and the inner surface of the cartridge is not less than those in the fuse-link with the highest rated current		P
	- fuse-links used with a given fuse-holder, or		P
	- fuse-links intended to be used in an arrangement identical for all rated currents of the homogeneous series		N/A
	- value of $RI_n^{3/2}$ does not exceed the value for the fuse-link with largest rated current of the homogeneous series (R measured as indicated in 8.1.5.1)		N/A
	the rated breaking capacity of fuse-links not greater than that of the fuse-link with the largest rated current within the homogeneous series		P
	- if not, the fuse-links with greater breaking capacity subjected to tests no. 1 and no. 2		N/A
	The fuse-link having the largest rated current tested completely according to Table 11		P
	The fuse-link having the smallest rated current tested only according to Table 12		P
	The fuse-links between the largest and smallest rated current tested according to Table 13		P
8.1.6	Testing of fuse-holders		P
	The fuse-holders are subjected to the tests according to Table 14		P
8.2	Verification of the insulating properties and of the suitability for isolation		P
8.2.1	Arrangement of the fuse-holder		P
	The fuse-holder fitted with a fuse-links of the largest dimensions for the type of fuse-holder concerned		P
	The fuse-base fixed to a metal plate, unless otherwise specified		P
	Fuse-link is replace while live - surfaces of fuse-link, of device for replacing it or of fuse-carrier, if of insulating material, are provided with metal coverings connected during tests to the frame of the apparatus; if of metal, they are connected direct to the frame		P
8.2.2	Verification of the insulating properties		P
	Points of application of the test voltage		P
	The test voltage is applied between:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) live parts and the frame with the fuse-link and the device for replacing it, or		P
	the fuse-carrier, if any, in position		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		P
	b) the terminals without fuse-link, device for replacing or the fuse-carrier		P
	no breakdown of insulation or flashover during 1 min of the applying test voltage		P
	c) live parts of different polarity in the case of multipole fuse-holder with fuse-links, fuse-carrier(s) or device(s) for replacing the fuse-links		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		N/A
	d) live parts which in the case of a multipole fuse-holder reach different potential after the fuse-link operates (equipped by fuse-carrier or device for replacing without fuse-link)		N/A
	no breakdown of insulation or flashover during 1 min of the applying test voltage		N/A
	The r.m.s. value of test voltage (V) as specified in Table 15	1890V	P
8.2.2.3.2	Fuse-holder is subjected to humid atmospheric conditions		P
	Relative humidity of ambient air (%)	91-95	P
	Ambient air temperature (°C)	20-30	P
	Duration of treatment (h)	144	P
	Insulation resistance is measured between the points prescribed in 8.2.2.1 by applying d.c. voltage of approximately 500 V		P
	Points of measuring:		P
	a) min. measured value (MΩ)	200MΩ	P
	b) min. measured value (MΩ)	200MΩ	P
	c) min. measured value (MΩ)		N/A
	d) min. measured value (MΩ)		N/A
	The insulation resistance not less than MΩ	1MΩ	P
8.2.3	Verification of the suitability for isolation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Clearances larger than values given in Table 9 are verified by dimensional measurement or by voltage test		N/A
	Points of application of the test voltage		N/A
	The test voltage is applied between:		N/A
	- terminals when the fuse-link and device for replacing it, are removed		N/A
	Test voltage (kV) for verification of the rated impulse withstand voltage is given in Table 16	kV	N/A
	The 1,2/50 μ s impulse voltage applied 5 times for each polarity at intervals of 1 s minimum		N/A
	no breakdown of insulation or flashover during of the applying test voltage		N/A
	no disruptive discharge during the test		N/A
8.2.4.2	Fuse-holder is subjected to humid atmospheric conditions		N/A
	Relative humidity of ambient air (%)		N/A
	Ambient air temperature ($^{\circ}$ C)		N/A
	Duration of treatment (h)		N/A
	Insulation resistance is measured between the points prescribed in 8.2.2.1 by applying d.c. voltage of approximately 500 V		N/A
	Points of measuring:		N/A
	a) min. measured value (M Ω)		N/A
	b) min. measured value (M Ω)		N/A
	c) min. measured value (M Ω)		N/A
	d) min. measured value (M Ω)		N/A
	The insulation resistance not less than 1 M Ω		N/A
8.3	Verification of temperature rise and power dissipation		P
8.3.1	One fuse used for test (unless otherwise stated by the manufacturer) mounted in free air		P
	Test performed at an ambient air temperature of (20 \pm 5) $^{\circ}$ C		P
	Ambient air temperature during the test ($^{\circ}$ C)		P
	Cross-sectional area (see Table17) (mm ² or mm x mm)	2 \times (40 \times 5) mm ²	

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Clause	Requirement + Test	Result - Remark	Verdict
	Tightened by torque; torque (Nm)	32Nm	—
8.3.2	The temperature of the fuse measured by method of measuring	Thermocouple	P
8.3.3	Measurement of the power dissipation of the fuse-link		P
	One fuse used for test (unless otherwise stated by the manufacturer) mounted in free air		P
	Test performed at an ambient air temperature of (20±5) °C		P
	Ambient air temperature during the test (°C)	25°C	P
	Cross-sectional area (see Table17) (mm ² or mm x mm)	2×(40×5) mm ²	—
	Tightened by torque; torque (Nm)	32Nm	—
8.3.4.1	Temperature rise of the fuse-holder		P
	Applied a.c. current (A) for test equal to the rated current of the fuse-holder	630A	P
	Test made with fuse-link (A), or	630A	P
	with a dummy fuse-link specified in subsequent parts	Part II	P
	Temperature rise limits T for contacts and terminals (Table 5):		P
	spring loaded contacts; limit (K)	unenclosed / enclosed max. 47K<65K	P
	bolted contacts; limit (K)	unenclosed / enclosed	N/A
	terminals; limit (K)	unenclosed / enclosed max. 48K<65K	P
8.3.4.2	Power dissipation of a fuse-link		P
	The test made with a.c. at the current (A) equal to the rated current of the fuse-link	630A	P
	The points of measuring	Central of blade	P
	Measured value of power (W) dissipation in limits (W) specified in subsequent parts	41,3W<48W	P
8.3.5	The acceptable power dissipation (W) of fuse-holder not less than the rated power dissipation of the corresponding fuse-links		P
	After the tests prescribed in 8.3, the insulating parts of the fuse-holders cooled down to ambient temperature withstood the test voltage according to 8.2	1890V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No deformation after tests of 8.3		P
8.4	Verification of operation	For 630A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	2 × (40 × 5) mm ²	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	787,5A	—
	the fuse-link did not operate within the conventional time of (h) (Table 2)	4h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)	1008A	—
	the fuse-link operated within the conventional time of (minutes) (Table 2)	2275s	P
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	4h	P
	Off-period of 0,1 of the conventional time	24min	P
	Test current (A) equal to 1,05 of the rated current . :	661,5A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	787,5A	—
	the fuse-link did not operate within the conventional time of (h) (Table 2)	4h	P
8.4	Verification of operation	For 500A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1)..... :	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	2 × (30 × 5) mm ²	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	625A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	4h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	4h	P
	Off-period of 0,1 of the conventional time	24min	P
	Test current (A) equal to 1,05 of the rated current ..	525A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	625A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	4h	P
8.4	Verification of operation	For 400A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	240	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	500A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)		-
	the fuse-link operated within the conventional time of (minutes) (Table 2)		N/A
8.4.3.2	Verification of rated current of "g" fuse-links		P

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Clause	Requirement + Test	Result - Remark	Verdict
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	3h	P
	Off-period of 0,1 of the conventional time	18min	P
	Test current (A) equal to 1,05 of the rated current . .	420A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	500A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
8.4	Verification of operation	For 315A	P
8.4.1	The test arrangement as specified in 8.1.4		P
	Length (m) of conductors (see 8.3.1).....	2m	P
	their cross-sectional area (mm ²) as specified in Table 17	185	P
8.4.2	Ambient air temperature during test within (20±5) °C		P
8.4.3.1	Verification of conventional non-fusing and fusing current		P
	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	393,6A	-
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
	b) the same fuse-link, after cooled down to ambient temperature, subjected to the conventional fusing current (I _f) (see Table 2)	504	-
	the fuse-link operated within the conventional time of (minutes) (Table 2)	7102s	P
8.4.3.2	Verification of rated current of "g" fuse-links		P
	One fuse-link submitted to a pulse test for 100 h		P
	On-period equal to conventional time (h)	3h	P
	Off-period of 0,1 of the conventional time	18min	P
	Test current (A) equal to 1,05 of the rated current . .	330,8A	P
	After the test, the fuse-link not have changed its characteristics		P
8.4.3.1	a) the fuse-link subjected to the conventional non-fusing current (I _{nf}) (see Table 2)	393,8A	-

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Clause	Requirement + Test	Result - Remark	Verdict
	the fuse-link did not operate within the conventional time of (h) (Table 2)	3h	P
8.4.3.3	Verification of time-current characteristics and gates		P
8.4.3.3.1	The time-current characteristics verified on the basis of the test according to 8.5		P
	Values of pre-arcing and operating times within the time-current zones:		P
	- indicated by the manufacturer		N/A
	- specified in subsequent parts	Part II	P
	Verification for smaller current ratings, if only one largest rated current fuse-link is subjected to the test according to 8.5 (in case of homogeneous series):		N/A
	"g" fuse-links (except "gD", "gG" and "gM")		N/A
	Tests made in connection with verification of the gates (see 8.4.3.3.2)		N/A
	Ambient air temperature within (20±5) °C		N/A
	rated current I_n (A) of the fuse-link		-
	test performed at voltage (V)		-
	test 3a) prospective current (A) equal to kI_n ($10 \leq k \leq 20$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	test 4a) prospective current (A) equal to kI_n ($5 \leq k \leq 8$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	test 5a) prospective current (A) equal to kI_n ($2,5 \leq k \leq 4$)		N/A
	pre-arcing time (s)		-
	specified pre-arcing time (s) max./min.		N/A
	Verification for smaller current ratings, if only one largest rated current fuse-link is subjected to the test according to 8.5 (in case of homogeneous series):		N/A
	"a" fuse-links		N/A
	Ambient air temperature within (20±5) °C		N/A
	rated current I_n (A) of the fuse-link		-
	test performed at voltage (V)		-
	test 3a) prospective current (A) equal to $nk_2 I_n$ ($5 \leq n \leq 8$)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
	test 4a) prospective current (A) equal to $nk_2 I_n$ ($2 \leq n \leq 3$)		N/A
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
	test 5a) prospective current (A) equal to $nk_2 I_n$ ($1 \leq n \leq 1,5$)		N/A
	pre-arcing time (s)		—
	specified pre-arcing time (s) max./min.		N/A
8.4.3.3.2	Verification of gates		P
	“gG” and “gM” fuse-links	“gG” / “gM”	P
	rated current of the fuse-link (A).....	630	—
	test performed at voltage (V)	Not specified	—
	a) testing current (A); pre-arcing time (s) higher than 10 s	2200A;70s	P
	b) testing current (A); pre-arcing time (s) less than 5 s	5100A;2,2s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s	8060A;670ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s	14140A;9ms	P
	“aM” fuse-links		N/A
	rated current of the fuse-link (A).....		—
	test performed at voltage (V)		—
	Cross-sectional area (see Table18) (mm^2 or mm x mm)		—
	e) testing current (A); pre-arcing time (s) higher than 60 s		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s		N/A
8.4.3.3.2	Verification of gates		P

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Clause	Requirement + Test	Result - Remark	Verdict
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	500	-
	test performed at voltage (V) :	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s :	1780A;67s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	3800A;2,2s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	6000A;650ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	10600A;8ms	P
	"aM" fuse-links		N/A
	rated current of the fuse-link (A)..... :		-
	test performed at voltage (V) :		-
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		-
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	"gG" and "gM" fuse-links	"gG" / "gM"	P
	rated current of the fuse-link (A)..... :	400	-
	test performed at voltage (V) :	Not specified	-
	a) testing current (A); pre-arcing time (s) higher than 10 s :	1420A;72s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	2840A;2,6s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	4500A;790ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	8060A;9ms	P
	"aM" fuse-links		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	rated current of the fuse-link (A)..... :		–
	test performed at voltage (V) :		–
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		–
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A
8.4.3.3.2	Verification of gates		P
	“gG” and “gM” fuse-links	“gG” / “gM”	P
	rated current of the fuse-link (A)..... :	315	–
	test performed at voltage (V) :	Not specified	–
	a) testing current (A); pre-arcing time (s) higher than 10 s :	1050A;73s	P
	b) testing current (A); pre-arcing time (s) less than 5 s :	2200A;2,7s	P
	c) testing current (A); pre-arcing time (s) higher than 0,1 s :	3420A;800ms	P
	d) testing current (A); pre-arcing time (s) less than 0,1 s :	6000A;9ms	P
	“aM” fuse-links		N/A
	rated current of the fuse-link (A)..... :		–
	test performed at voltage (V) :		–
	Cross-sectional area (see Table18) (mm ² or mm x mm)..... :		–
	e) testing current (A); pre-arcing time (s) higher than 60 s :		N/A
	f) testing current (A); pre-arcing time (s) less than 60 s :		N/A
	g) testing current (A); pre-arcing time (s) higher than 0,2 s :		N/A
	h) testing current (A); pre-arcing time (s) less than 0,10 s :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3.4	Overload	For 315A and 630A	P
	The test arrangement is same as that for the temperature rise test (see 8.3.1)		P
	Three fuse-links submitted to 50 pulses having the same duration and test current		P
	test performed at voltage (V)	Not specified	
	"g" fuse-links:		P
	test current (A) equal to 0,8 times the current stated for a pre-arcing time of 5 s	1072A/2240A	P
	duration of each pulse 5 s		P
	time (s) interval between pulses equal to 20 % of the conventional time (s) specified in Table 2	36min/48min	P
	"a" fuse-links:		N/A
	rated current I_n (A) of fuse-link		N/A
	test current (A) equal to $k_1 I_n \pm 2\%$		N/A
	the pulse duration (s) corresponds to that indicated on the overload curve for $k_1 I_n$ stated by manufacturer		N/A
	time (s) intervals between pulses equal to 30 times the pulse duration		N/A
	fuse-links having ambient air temperature subjected to a current (A) equal to current for the overload test	1072A/2240A	P
	pre-arcing time (s) of sample lies within the manufacturers time-current zone	1) 74s/64,9s 2) 82s/46,3s 3)101s/57,2s	P
8.4.3.5	Conventional cable overload protection (for "gG" fuse-links only)		N/A
	fuse-link mounted as specified in 8.4.1		N/A
	provided with PVC insulated copper conductors of cross-sectional area (mm^2) (see Table 19)		N/A
	fuse and conductor connected to it, preheated with rated current (A) of fuse-link		N/A
	for a time (h) equal to the conventional time		N/A
	test current increased to $1,45 I_z$ (A) (I_z specified in Table 19)		N/A
	the fuse-link operated in time (s) less than the conventional time (s)		N/A
8.4.3.6	Operation of indicating devices and strikers, if any		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Operation of indicating device verified in combination with the verification of breaking capacity (see 8.5.5)		P
	The verification of striker operation:		N/A
	"g" fuse-link tested at current (A) equal to current I_4 (see Table 20 and 21)		N/A
	recovery voltage (V)		N/A
	stated recovery voltage (V)		N/A
	"a" fuse-link tested at current (A) equal to current $2k_1 I_n$ (A) (see Figure 2)		N/A
	recovery voltage (V)		N/A
	stated recovery voltage (V)		N/A
	Striker operate during all tests made at recovery voltage of at least 20 V		N/A
	No failure of indicating device or striker		P
8.5	Verification of the breaking capacity		P
8.5.1	The test arrangements as specified in 8.1.4		P
8.5.2	Characteristics of the test circuit as specified		P
	Scheme of test circuit (see Figure 5)		P
	Deviations form specified characteristics of test circuit		P
8.5.3	Measuring instruments		P
8.5.4	Calibration of test circuit		P
	Calibration oscillograms and their evaluation		P
8.5.6	The breaking-capacity tests made at an ambient air temperature of $(20 \pm 5) ^\circ\text{C}$		P
	Breaking-capacity tests on a.c. fuses		P
8.5.5.1	Table 20, test No. 1 for "g" and "a" fuse-links	For 315A	P
	Rated breaking capacity of the fuse-links (kA), at voltage (V)	120kA,500VAC	-
	Rated current (A) of the fuse-links	315A	P
	Prospective current I_1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%	120kA	P
	Power factor	0,20	P
	Initiation of arcing after voltage zero: within $40^\circ - 65^\circ$ for sample 1 and within $65^\circ - 90^\circ$ for sample 2 and 3, or	1) 46,0 2) 77,0 3) 69,0	P

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Clause	Requirement + Test	Result - Remark	Verdict
	for sample 1) arcing after voltage zero within 0° + 10°, - 0°		N/A
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568V 2) 568V 3) 568V	P
	Cut-off current (A)	1) 28,7kA 2) 31,0kA 3) 30,6kA	P
8.5.8	Acceptability of No. 1 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	990,0V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 20 2) 20 3) 50	P
8.5.5.1	Table 20, test No. 1 for "g" and "a" fuse-links	For 630A	P
	Rated breaking capacity of the fuse-links (kA), at voltage (V)	120kA,500VAC	-
	Rated current (A) of the fuse-links	630A	P
	Prospective current I1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%	120kA	P
	Power factor	0,20	P
	Initiation of arcing after voltage zero: within 40° - 65° for sample 1 and within 65° - 90° for sample 2 and 3, or	1) 49,0 2) 84,0 3) 81,0	P
	for sample 1) arcing after voltage zero within 0° + 10°, - 0°		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568V 2) 568V 3) 568V	P
	Cut-off current (A)	1) 59,4kA 2) 57,7kA 3) 54,1kA	P
8.5.8	Acceptability of No. 1 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	1021,0V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 20 2) 50 3) 10	P
8.5.5.1	Table 20, test No. 2 for "g" and "a" fuse-links		P
	Prospective current I ₂ (kA)	41,80kA	P
	Test made under conditions which approximate those giving maximum arc energy		P
	Power factor	0,15	P
	Making angle after voltage zero: within tolerance 0° + 20°, - 0°	1) 5,0 2) 3,0 3) 4,0	P
	Power-frequency recovery voltage: voltage (V) i.e (%) of rated voltage within 105% + 5%, - 0% of the rated voltage or 110% + 5%, - 0% of the rated voltage	1) 568 2) 568 3) 568	P
	Recovery voltage maintained at a value (V); duration (s) for sample (No.)		P
	For other samples duration 15 s (8.5.5.2)		P
8.5.8	Acceptability of No. 2 test results		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	1024,0V<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 500 2) 200 3) 200	P
8.5.5.1	Table 20, test No. 2* for "g" and "a" fuse-links, for $I_2 \geq I_1$	(see appended table)	N/A
	Prospective current I_2 (kA) for test No. 2 greater than the rated breaking capacity (kA)		N/A
	Test made on six samples replacing tests of Nos. 1 and 2. Test made with current I_1 (kA)		N/A
	Making angels differ approximately 30° between each test		N/A
	Power factor		N/A
8.5.8	Acceptability of No. 2 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
8.5.5.1	Table 20, test No. 3 for "g" and "a" fuse-links		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Prospective current for "g" fuse-link I_3 (A) equal to $3,2 I_f$	3300A	P
	Prospective current for "a" fuse-link I_3 (A) equal to $2,5 k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current $\pm 20\%$		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2)		P
8.5.8	Acceptability of No. 3 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 25 2) 3)	P
8.5.5.1	Table 20, test No. 4 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_4 (A) equal to $2,0 I_f$	2100A	P
	Prospective current for "a" fuse-link I_4 (A) equal to $1,6 k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current + 20%, - 0%		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2) :		P
8.5.8	Acceptability of No. 4 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 50 2) 3)	P
8.5.5.1	Table 20, test No. 5 for "g" and "a" fuse-links		P
	Prospective current for "g" fuse-link I_5 (A) equal to $1,25 I_f$	1300A	P
	Prospective current for "a" fuse-link I_5 (A) equal to $k_2 I_n$		N/A
	Power factor	0,45	P
	Tolerance on current + 20%, - 0%		P
	Recovery voltage (V) maintained for 15 s (8.5.5.2) :		P
8.5.8	Acceptability of No. 5 test results		P
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)	<2500V	P
	b) fuse-links operated without external effects or damage to the components of the complete fuse		P
	c) no permanent arcing, flashover or ejection of dangerous flames		P
	d) no damage of fuse components hindering from their further use		P
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		P
	f) fuse-link remains in one piece before its removal from the fuse- carrier		P
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 34 2) 3)	P
	Breaking-capacity tests on d.c. fuses		N/A
8.5.5.1	Table 21, d.c.test No. 1 for "g" and "a" fuse-links		N/A
	Rated breaking d.c. capacity of the fuse-links (kA), at voltage (V)		-
	Rated current (A) of the fuse-links		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated voltage (V) of the fuse-links		N/A
	Prospective current I_1 (kA) equal to rated breaking capacity within a tolerance of + 10%, - 0%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 1 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 2 for "g" and "a" fuse-links		N/A
	a) During test No. 1 arcing commences at a current $\geq 0,5 I_1$, test No. 2 was not performed		N/A
	b) Prospective current I_2 (A). Test made under conditions which approximate those giving maximum arc energy		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.8	Acceptability of No. 2 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 3 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A)		-
	Prospective current I ₃ (A) equal to 3,2 I _f		N/A
	Tolerance on current (%) ± 20%		N/A
	Time constant (ms) between 15 to 20 ms		N/A
	Arcing commences at current (A)	1) 2) 3)	-
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage	1) 2) 3)	N/A
8.5.8	Acceptability of No. 3 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6)		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 4 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A) :		—
	Prospective current I ₄ (A) equal to 2,0 I _f :		N/A
	Tolerance on current (%) + 20%, - 0% :		N/A
	Time constant (ms) between 15 to 20 ms :		N/A
	Arcing commences at current (A) :	1) 2) 3)	—
	Value of recovery voltage: voltage (V) within tolerances 115 + 5%, - 9% of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 4 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6) :		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (MΩ) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.5.5.1	Table 21, d.c.test No. 5 for "g" and "a" fuse-links		N/A
	Conventional fusing current (A) :		—
	Prospective current I ₅ (A) equal to 1,25 I _f :		N/A
	Tolerance on current (%) + 20%, - 0% :		N/A
	Time constant (ms) between 15 to 20 ms :		N/A

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Arcing commences at current (A) :	1) 2) 3)	
	Value of recovery voltage: voltage (V) within tolerances $115 + 5\%$, $- 9\%$ of the rated voltage :	1) 2) 3)	N/A
8.5.8	Acceptability of No. 5 test results		N/A
	a) max. arc voltage (V) did not exceed stated values of 7.5 (Table 6) :		N/A
	b) fuse-links operated without external effects or damage to the components of the complete fuse		N/A
	c) no permanent arcing, flashover or ejection of dangerous flames		N/A
	d) no damage of fuse components hindering from their further use		N/A
	e) no damage of fuse-link such, that it is difficult or dangerous to replace them		N/A
	f) fuse-link remains in one piece before its removal from the fuse- carrier		N/A
	g) resistance (M Ω) between contacts of fuse-links after test not less than 50 000 Ω for the rated voltage of fuse-links to 250 V, 100 000 Ω in all other cases :	1) 2) 3)	N/A
8.6	Verification of the cut-off current characteristics		P
8.6.2	The values measured did not exceed cut-off characteristics indicated by the manufacturer (see 5.8.1)		P
8.7	Verification of I^2t characteristics and overcurrent discrimination		P
8.7.2	The operating I^2t values measured not exceed the values indicated by the manufacturer, or		P
	those specified in subsequent parts		P
	The pre-arcing I^2t values not less than minimum pre-arcing values given by the manufacturer, or		N/A
	they lie within the limits indicated in Table 7		P
8.7.3	Verification of compliance for fuse-links at 0,01 s		P
	"gG" and "gM" fuse-links at 0,01 s comply with Table 7		P
8.7.4	Verification of overcurrent discrimination		P

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The discrimination of the fuse-links verified by means of the time-current characteristics and the pre-arcing and operating I^2t values		P
8.8	Verification of the degree of protection of enclosures		P
	Degree of protection IP : IP00		P
	Verification by test under conditions specified in IEC 60529 :		P
8.9	Verification of resistance to heat		P
	No damage impaired by heat during the previous tests (in particular with respect to 8.3, 8.4, 8.5 and 8.10)		P
8.10	Verification of non-deterioration of contacts		P
8.10.1	Three samples provided with standardized dummy fuse-links of the highest current rating (A) intended to be used in the fuse-holder (see subsequent parts) :		P
8.10.2	Test current (A) for load period :	787,5A	P
	Duration (s) of load period :	1h	P
	Duration (s) of no-load period :	0,4h	P
	a) Test of 250 cycles, measured values not exceed the limits given in subsequent parts		P
	b) Test of 750 cycles, measured values not exceed the limits given in subsequent parts		P
8.11	Mechanical and miscellaneous tests		P
8.11.1	Mechanical strength		P
	Mechanical characteristics of fuse and its parts judged in the context of normal handling and mounting as well as with results shown after breaking-capacity test (see 8.5), if not otherwise specified in the subsequent parts		P
8.11.2	Miscellaneous tests		P
8.11.2.1	Verification of freedom from season cracking		P
	Current-carrying parts made of rolled copper alloy with less than 83% copper content and with all grease removed, placed for 4 h in test cabinet having temperature of (30 ± 10) °C		P
	After this, samples placed for 8 h in test cabinet, on the bottom of which is ammonium chloride solution having pH value 10 - 11		P
	After test no cracks visible to the unaided eye		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.11.2.2	Verification of resistance to abnormal heat and fire		P
8.11.2.2.1	Parts of insulating material, except ceramic, have a limited duration of burning without spreading fire by flames or burning droplets or glowing particles falling from the specimen		P
8.11.2.2.5	Glow-wire test: (650 ± 10) °C		N/A
	Parts of insulating materials not necessary to retain current-carrying parts in position even though they are in contact with them, made the glow-wire test (650 ± 10) °C		N/A
	No visible flame, or burning or glowing of the specimen extinguish within max. (s) after removal of the glow-wire. Limit (30 ± 1) s		N/A
	No burning of the tissue paper		N/A
	No scorching of the pinewood board		N/A
	Glow-wire test: (960 ± 10) °C	No flame	P
	Parts of insulating materials necessary to retain current-carrying parts and parts of the earthing circuit, if any, in position , made the glow-wire test (960 ± 10) °C		P
	No visible flame, or burning or glowing of the specimen extinguish within max. (s) after removal of the glow-wire. Limit (30 ± 1) s		P
	No burning of the tissue paper		P
	No scorching of the pinewood board		P
8.11.2.3	Verification of resistance to rusting		P
	Tested parts after degreasing (10 min in specified solution) placed for 10 min in air saturated with moisture and after that dried 10 min in an ambient temperature (100 ± 5) °C		P
	Surface of tested parts show no signs of rust		P

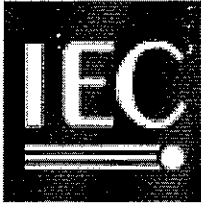
IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict

APPENDIX 1

8.1.5.1	TABLE: Internal resistance of the fuse-links												P
	a) rated current (A) of the fuse-link		:	315									—
	measuring current (A)		:	31,5									—
	ambient air temperature (°C)		:	25									—
internal resistance	sample No.												
	1	2	3	4	5	6	7	8	9	10	11	12	
R (mΩ)	0,182	0,190	0,188	0,191	0,191	0,189	0,191	0,192	0,187	0,184	0,185	0,191	
	b) rated current (A) of the fuse-link		:	400									—
	measuring current (A)		:	40									—
	ambient air temperature (°C)		:	25									—
internal resistance	sample No.												
	1	2	3	4	5								
R (mΩ)	0,160	0,158	0,157	0,161	0,157								
	c) rated current (A) of the fuse-link		:	500									—
	measuring current (A)		:	50									—
	ambient air temperature (°C)		:	25									—
internal resistance	sample No.												
	1	2	3	4	5								
R (mΩ)	0,114	0,116	0,115	0,115	0,117								
	c) rated current (A) of the fuse-link		:	630									—
	measuring current (A)		:	63									—
	ambient air temperature (°C)		:	25									—
internal resistance	sample No.												
	1	2	3	4	5	6	7	8	9	10	11	12	
R (mΩ)	0,082	0,086	0,085	0,087	0,083	0,085	0,086	0,088	0,084	0,085	0,087	0,083	
internal resistance	sample No.												
	13	14	15										
R (mΩ)	0,088	0,087	0,086										

IEC 60269-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.5.5.1	TABLE: Table 20, test No. 2* for "g" and "a" fuse-links, for $I_2 \geq I_1$				N/A
sample No.	making angle after voltage zero	recovery voltage		cut off current	resistance between contacts
	(°)	(V)	(%)	(A)	(MΩ)
1					
2					
3					
4					
5					
6					



Test Report issued under the responsibility of:



TEST REPORT IEC 60269-2 Low-voltage fuses Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to I	
Report Reference No.	15033143 001 Part II
Date of issue.....	30.07.2009
Total number of pages.....	18 pages
Testing Laboratory	TÜV Rheinland (Shanghai) Co., Ltd.
Address.....	10-15/F, Huatsing Building, No.88, Lane 777, Guangzhong Road West, 200072 Shanghai Zhabei District, P.R. China
Applicant's name	Wenzhou Jinlida Electrical Co., Ltd.
Address.....	Xirendang Industrial Zone, Liushi, Wenzhou, Zhejiang 325604 P.R. China
Test specification:	
Standard	IEC 60269 - 2 : 2006 (third edition) (see also IEC 60269 – 1:1998)
Test procedure.....	CB
Non-standard test method.....	N/A
Test Report Form No.	IEC60269_2A
Test Report Form(s) Originator	EZU
Master TRF.....	Dated 2007-12
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Test item description.....	Fuses(fuse link and fuse base)
Trade Mark	JINLIDA
Manufacturer.....	Same as applicant
Model/Type reference	NH3
Ratings.....	AC 500V; 315A,400A,500A,630A; 120kA; Size 3

Testing procedure and testing location:	
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address.....:	TÜV Rheinland (Shanghai) Co., Ltd. Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
<input type="checkbox"/> Associated CB Test Laboratory: Testing location/ address.....:	
Tested by (name + signature).....: Approved by (+ signature):	
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature):	
Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature).....: Approved by (+ signature):	
Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature):	
Supervised by (+ signature).....: Testing location/ address.....:	
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature):	
Supervised by (+ signature).....: Testing location/ address.....:	

Summary of testing:	
Tests performed (name of test and test clause): For homogeneous series of NH3, type tests are listed in table 11, 12, 13 and 14 in EN 60269-1:2006	Testing location: Hunan Electrical Apparatus Testing Institute 4 Xinzhong Road, Changsha, Hunan, P.R. China
Summary of compliance with National Differences: N/A	

Copy of marking plate:
Refer to 15033143 001 Part I.

Test item particulars:	
Classification of installation and use.....:	See part I
Supply Connection.....:	See part I
Fuse system.....:	A /B/C/D/E/F/G/H/I
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.....:	06.2009
Date (s) of performance of tests.....:	06.2009-07.2009
General remarks:	
<p>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. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>	
General product information:	
N/A	

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
Requirements IEC 60269-1			

FUSE SYSTEM A – FUSES WITH FUSE-LINKS WITH BLADE CONTACTS (NH FUSE SYSTEM)

5	CHARACTERISTICS OF FUSES		
5.2	Rated voltage (V) as specified	500VAC	P
5.3.1	Rated current (A) of the fuse-link in accordance with specified values		P
5.3.2	Rated current (A) of the fuse-holder and the size of the fuse-link	Size 3	P
5.5	Rated power (W) dissipation of fuse-link see Figure 101	<48W	P
	Rated acceptable power (VA) dissipation of fuse-bases given in Figure 102	60W	P
5.6	Limits of time-current characteristics		P
5.6.1	Time-current characteristics, time-current zones and overload curves		P
5.6.2	Conventional times and current see Table 101		P
5.6.3	Gates		P
5.7.2	Rated breaking capacity (A)	120kA	P

6	MARKING		
	Markings are legible		P
6.1	Fuse-holders marked by:		P
	- IEC 60269-2		P
	- size	3	P
	Marking of rated current and rated voltage are discernible from the front		P
6.2	Fuse-links marked by:		P
	- IEC 60269-2		P
	- size or reference	3	P
	- rated breaking capacity	120kA	P
	Marking of rated current and rated voltage are discernible from the front		P
	Fuse-links are marked as described in Table 104.. :		P
7	STANDARD CONDITIONS FOR CONSTRUCTION		

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1	Mechanical design		P
	The dimensions of the fuse-links given in Figure 101		P
	Dimensions:		P
	dimension marking a1: prescribed (mm); measured (mm)	150±2,5;	P
	dimension marking a2: prescribed (mm); measured (mm)	75-10;	P
	dimension marking a3: prescribed (mm); measured (mm)	62±2,5;	P
	dimension marking a4: prescribed (mm); measured (mm)	68±2,5;	P
	dimension marking b1min: prescribed (mm); measured (mm)	32;	P
	dimension marking b2min: prescribed (mm); measured (mm)	11;	P
	dimension marking b3max: prescribed (mm); measured (mm)	6;	P
	dimension marking b4min: prescribed (mm); measured (mm)	29;	P
	dimension marking c1: prescribed (mm); measured (mm)	60;	P
	dimension marking c2: prescribed (mm); measured (mm)	11-2;	P
	dimension marking d: prescribed (mm); measured (mm)	2,5+1,5/-0,5	P
	dimension marking e1max: prescribed (mm); measured (mm)	76;	P
	dimension marking e2max: prescribed (mm); measured (mm)	75;	P
	dimension marking e3: prescribed (mm); measured (mm)	20+5/-2;	P
	dimension marking e4: prescribed (mm); measured (mm)	6;	P
	dimension marking f: prescribed (mm); measured (mm)	18;	P
	dimension marking z: prescribed (mm); measured (mm)	5	P
	The dimensions of the fuse-base given in Figure 102		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Dimensions:		P
	dimension marking g: prescribed (mm); measured (mm)	73±1	P
	dimension marking h: prescribed (mm); measured (mm)	210±1,5;	P
	dimension marking n1max: prescribed (mm); measured (mm)	75;	P
	dimension marking n2max: prescribed (mm); measured (mm)	83;	P
	dimension marking p1max: prescribed (mm); measured (mm)	68;	P
	dimension marking p2: prescribed (mm); measured (mm)	35;	P
	dimension marking r min: prescribed (mm); measured (mm)	20;	P
	dimension marking s max: prescribed (mm); measured (mm)	58;	P
	dimension marking t min: prescribed (mm); measured (mm)	33;	P
	dimension marking v: prescribed (mm); measured (mm)	80+3;	P
	dimension marking w1: prescribed (mm); measured (mm)	30±0,7;	P
	dimension marking w2: prescribed (mm); measured (mm)	25±0,7;	P
	dimension marking x min: prescribed (mm); measured (mm)	20;	P
	dimension marking y: prescribed (mm); measured (mm)	10,5±0,5;	P
	dimension marking z max: prescribed (mm); measured (mm)	5	P
7.1.2	Connections, including terminals cross-sectional ranges (Table 105) torques to be applied (Table 111) (lug terminal)		P
7.1.3	Contact surfaces should be silver plated	Yes / No	P
	If no test according to 8.10 are passed with dummies described in 8.10.1		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.5	Dynamic short-circuit withstand shall meet cut-off currents (Table 112)		P
7.1.7	Construction of fuse-link		P
	Blade contacts made of solid material		P
	If any other construction, manufacturer demonstrate that construction adequate		N/A
	Endplates not permitted to protrude radially from insulation body		P
	preferable to insulate the gripping lugs from live parts		P
	Fuse-links has an indicator.....		P
	Electrically conductive parts of indicator not ejected from the fuse-link during operation		P
7.2	Insulating properties		P
	Creepage distances and clearances of fuses and fuse-accessories meet requirements of IEC 60664-1 for overvoltage category III and pollution degree 3...:		P
7.7	I ² t characteristics		P
	maximum pre-arcing I ² t (Table 7 of IEC 60269-1)		P
	rated currents lower than 16 A (Table 106)		N/A
	maximum operating I ² t for "aM" fuse-links (Table 107) test No. 2 of the largest rated current of each homogeneous series (Table 20 of IEC 60269-1) ...:		N/A
7.8	Overcurrent discrimination of "gG" fuse-links (see 8.7.4, Table 108)		P
7.9	Protection against electric shock		P
	increased by means of partition walls and covers of fuse-contacts		P
	operation by authorized persons, instructed in electrical matters, using replacement handles according to this fuse system.....		P

IEC 60269-2			
Clause	Requirement + Test	Result - Remark	Verdict
8	TESTS		
	IEC 60269-1 applies with the following supplementary requirements		P
8.1.4	Arrangement of fuse and dimensions		P
	Requirements of 7.2 verified on fuse-bases		P
	Creepage distances and clearances of fuse-links according to 7.2 are verified		P
	Clearances verified on fuse-link inserted into model fuse-base according to Figure 111.....		P
8.1.6	Testing of fuse-holders		P
	In addition to test given in IEC 60269-1 tested according to Table 109.....		P
8.2.2.1	Points of application of test voltage		P
	In addition to IEC 60269-1 e) between isolated metal gripping-lugs and terminals of test fuse-bases	1890V	P
8.2.3.2	Value of test voltage	Not applicable	N/A
	rated impulse withstand voltage in Table 110.....		N/A
8.2.3.3	Test method		N/A
	5 impulses of both polarities and of shape 1,2/50 μ s and rated withstand voltage level according to Table 110..... minimum period between impulses are 1 s		N/A
8.2.4	Acceptability of test results		P
8.2.4.3	No flash-over or puncture shall occur during test ...		P
8.2.5	Resistance to tracking		P
	plastic parts of fuse-links and fuse-bases tested and shall pass at PTI level stated by manufacturer	500M	P
8.3	Verification of temperature rise and power dissipation		P
8.3.1	Arrangement of the fuse		P
	Tightened by torque (Nm)	32	
8.3.2	Measurement of the temperature rise		P
	Protective covers and fuse-carriers as provided by manufacturer mounted		P
8.3.4.1	Temperature rise of the fuse-holder	See part I	P

IEC 60269-2				
Clause	Requirement + Test		Result - Remark	Verdict
	Dummy (Figure 105) Point at which temperature rise is measured (Figure 106)			P
8.3.4.2	Power dissipation of a fuse-link (Figure 106)		41,3W	P
8.4.3.1	Verification of conventional non-fusing and fusing current		See part I	P
	non-fusing current test – second test specimen are used for b)		See part I	P
8.4.3.5	Conventional cable overload protection test (for “gG” fuse-links only)		See part I	P
	Details of special test are given in Annex A		Not required	N/A
Annex A	Special test for cable overload protection			N/A
	For fuses with $I_n > 16$ A of the sizes 00, 0, 1 and 2. :			N/A
A.1	Arrangement of the fuse			N/A
	Three fuse-links in fuse-bases mounted in a box... :			N/A
	Ambient air temperature outside the fuse box shall be (30 ⁺⁵ ₀ °C)		°C	N/A
A.2	Test method and acceptability of test results			N/A
	1,13 I_n flowed through the fuse-links for conventional time (see Table 2 of IEC 60269-1)		A for s	N/A
	Non of fuse-links operated			N/A
	Test current raised without interruption within 5 s to 1,45 I_n		A	N/A
	One fuse-link operated within conventional time :			N/A
8.5.5.1	Verification of the peak withstand current of a fuse- base		Not applicable	N/A
	not be carried out , if this has already been verified during the breaking capacity test of fuse-links with the highest rating of the size			N/A
8.5.5.1.1	Arrangement of the fuse			N/A
	single-phase type, 8.5.1 of IEC 60269-1 peak values of the test currents (Table 112)			N/A
	maximum values (see 8.5.5.1.3).....			
	dummy fuse-link (Figure 101)			
8.5.5.1.2	Test method			N/A

IEC 60269-2				
Clause	Requirement + Test		Result - Remark	Verdict
	fuse-base 1 (Figure107) resilient spring travel is limited to elastic range..... : contacts opened up three times			N/A
	fuse-base 2 (see 8.11.1.2) F_{max} according to Table 118			N/A
8.5.5.1.3	Acceptability of test results			N/A
	fuse-links not be ejected			N/A
	no signs of arcing or welding or other damage			N/A
8.5.8	Acceptability of test results			N/A
	Fuse or circuit-breaker not operate during this test			N/A
8.7.4	Verification of overcurrent discrimination			P
	verified by I^2t values evaluated from the recorded test results			P
	Arrangement of the samples as for the breaking capacity test			P
	two samples tested at the r.m.s. prospective test current I , corresponding to minimum pre-arcing I^2t		1) 2)	P
	the other samples tested at the r.m.s. prospective test current I , corresponding to operating I^2t		3) 4)	P
	test voltage (V)			
	The values of I^2t lie within corresponding limits specified in Table 113.....			P
8.9	Verification of resistance to heat			P
	Tests apply to fuse-link and fuse-base			P
	Fuse-holder with fuse-links having maximum power dissipation are cyclically loaded as pre-treatment... :			P
	After cooling to normal temperature breaking capacity tested at I_1 (see 8.5)..... :		$I_1 = 120kA$	P
	Fuse-links with organic material Fuse-holder with fuse-links having maximum power dissipation are cyclically loaded as pre-treatment....			N/A
	After cooling to normal temperature breaking capacity tested at I_1 and I_5 (see 8.5)..... :		$I_1 =$ $I_5 =$	N/A
8.9.1	Fuse-base			P

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Clause	Requirement + Test	Result - Remark	Verdict
	test below apply if it is not obvious that components are not affected adversely by given temperature and withdrawal forces		P
8.9.1.1	Test arrangement		P
	Figure 105 and 108		P
	Test se-up in heating chamber		P
8.9.1.2	Test method		P
	Temperature of $(80^{+5})^{\circ}\text{C}$ for 2 h		P
	160% rated current for 2 h..... :	160% $I_n = 1008\text{A}$	P
	Test voltage :	50 V	—
	3 min after switching off tensile force F_{\max} (see Table 118) exerted for 15 s	$F_{\max} =$	P
8.9.1.3	Acceptability of test results		P
	Contact pieces not have moved to affect the further use		P
	Dimensions of Figure 102 are considered		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.9.2	Fuse-links with gripping lugs of moulded material or of metal fixed in moulded material	No such part	N/A
8.9.2.1	Test arrangement		N/A
	Figure 108		N/A
8.9.2.2	Test method		N/A
	Temperature of $(80^{+5})^{\circ}\text{C}$ for 2 h		N/A
	150% rated current for conventional time :	A for h	N/A
	Test voltage :	V	—
	3 min after fuse-link operated or conventional time expired tensile force F_{\max} (see Table 118) exerted for 15 s	$F_{\max} =$	N/A
8.9.2.3	Acceptability of test results		N/A
	Gripping lugs remain fully operational		N/A
	Dimensions of Figure 101 (d and c_2) not be exceeded by more than 2 mm		N/A
8.10	Verification of non-deterioration of contacts and direct terminal clamps		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.10.1	Arrangement of the fuse		P
	Figure 105		P
	for lug terminals, torque in Table 111..... :	32 Nm	—
	Insulation of conductors removed over the whole length		P
8.10.1.2	Direct terminal clamps		P
	Test performed on 10 direct terminal clamps of five fuse-bases		P
	Distance between fuse-base centres of at least three times e_2 (see Figure 101)		P
	Torque of tightened of screws	Nm	—
	Conductor cross-section	mm ²	—
8.10.2	Test method		P
	Test current (A) for load period	787,5A	P
	Duration (s) of load period	1h	P
	Duration (s) of no-load period	0,4h	P
	Test voltage (V)	50V	—
	a) Test of 50 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	b) Test of 250 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	c) Test of 500 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
	d) Test of 750 cycles, measured values did not exceed the limits given in subsequent parts of IEC 60269	(see appended table)	P
8.10.2.1	Contacts		P
	Points between voltage drop is measured (A and B in Figure 106)		P
	Withdrawal force (Table 118); measured force after 250 cycles (N)	1) 2) 3)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Withdrawal force (Table 118); measured force after 750 cycles (N)	1) 2) 3)	P
	If measured values too low, test of 8.5.5.1		N/A
8.10.2.2	Direct terminal clamps		P
	Points between voltage drop is measured (Figure 110)		P
	Test sequence for all types conductors (see Table 116)		P
	Verification of temperature rise (see 8.3.4.1) (see figure 110)		P
8.10.3	Acceptability of test results		P
8.10.3.1	Contacts		P
	Limit value after 250 th cycle $\leq 15\%$		P
	Limit value after 500 th cycle $\leq 30\%$		P
	Limit value after 750 th cycle $\leq 40\%$		P
	Difference between last and first measurement of temperature rise less than 20 K		P
8.10.3.2	Direct terminal clamps		P
	Permissible tolerance for resistance R_{cl0} for Al conductors : $R_{cl0\ max} \leq 2 R_{cl0\ min}$		P
	Permissible changes of the resistance from R_{cl50} to R_{cl750} : see Table 117		P
	Copper or cleaned aluminium conductors		P
	Uncleaned aluminium conductors		N/A
	Change from 50 th to 250 th cycle		P
	Change after 250 th to 500 th cycle		P
	Change after 500 th to 750 th cycle		P
	Change between 50 th to 750 th cycle		P
	Temperature rise at test spot $F < 75K$		P
8.11	Mechanical and miscellaneous tests		P
8.11.1.1	Mechanical strength of fuse-holders		P
	Test set-up subjected to temperature rise test at rated current	630A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	fuse-link or fuse-carrier are withdrawn and inserted into fuse-base 100 times	100 times	
	All parts are intact and function normally		P
	Test set-up subjected to further temperature rise test at rated current (values obtained are not more than 5 K or 15 % above the values from temperature-rise test prior)	Max. 53K	P
8.11.1.2	Mechanical strength of the fuse-base		P
	Test-link inserted three times in the fuse-base : (Dimensions of blade contacts see Figure 101) (Withdrawal force F lied within limits in Table 118)		P
	Steel screws are fastened three times at the terminals, torque of 1,2 times value specified by manufacturer or value of Table 111		P
	Contact pieces not have moved to affect the further use		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.11.1.8	Impact resistance of gripping-lugs of moulded material or of metal fixed in moulded material		N/A
8.11.1.8.1	Test arrangement		N/A
8.11.1.8.2	Facility is given in Figure 109		N/A
	One fuse-link ... $(150 \pm 5)^{\circ}\text{C}$ for 168 h		
	Another one -15°C for 72 h		
	One impact on each of gripping-lugs		N/A
8.11.1.8.3	Acceptability of test results		N/A
	No damage capable of hindering their further use		N/A
	No bent out by more than 3 mm		N/A
	Coupling with a handle (Figure 103) not are hindered		N/A
8.11.2.3	Verification of resistance to rusting		N/A
8.11.2.3.1	According to ISO 6988 cyclic moist atmosphere containing 0,2% SO ₂ (SFW 0,2 S) for 1 cycle		N/A
8.11.2.3.2	Optional test (severe environmental conditions)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fuse-links and fuse-bases for used in environment of pollution degree ≥ 3 tested with SFW 2,0 S for 5 cycles		N/A
	They marked accordingly		N/A
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base		P
8.11.2.4.1	Test method		P
	Period 168 h	168	
	for equipment comprising moulded elements to support live parts $(150\pm 5)^{\circ}\text{C}$	150	
	for covers $(100\pm 5)^{\circ}\text{C}$		
	Period greater than 1 h	1h	
	for sealing compounds; stability of marking $(150\pm 5)^{\circ}\text{C}$		
	After cooling to ambient temperature the following are tested.		P
	Fuse-links: breaking capacity with I_1 and I_2		P
	Fuse-base: mechanical strength in accordance with 8.11.1.2		P
8.11.1.2	Mechanical strength of the fuse-base		P
	Test-link inserted three times in the fuse-base : (Dimensions of blade contacts see Figure 101) (Withdrawal force F lied within limits in Table 118)		P
	Steel screws are fastened three times at the terminals, torque of 1,2 times value specified by manufacturer or value of Table 111		P
	Contact pieces not have moved to affect the further use		P
	Insulating mounting part no broken and no show any signs of cracks		P
8.11.2.4.2	Acceptability of test results		P
	Not have changed of positions of fuse-base contacts to correct functioning		P
	No fracture nor any signs of fracture on insulating body with terminals		P
	Mechanical strength of cemented joints not impaired		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Sealing compounds not shifted to extent permitting live parts to exposed		P
	Fuse-links operate correctly		P
	Marking are durable and easily legible		P