Technical Construction File

IEC 60269-6:2010+AMD1:2021 Low-voltage fuses - Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems

Report reference No..... :	TLZJ21111234756
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Approved by (+ signature)..... :	Kosco Vent / Project Manager
Date of issue..... :	November 16,2021
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Reviewing location..... :	Floor 2nd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.
Applicant..... :	Changcheng Electrical Group Zhejiang Technology Co., Ltd.
Address..... :	DianHou Village, Liushi Town, Yueqing City, Zhejiang P.R. China
Manufacturer..... :	Changcheng Electrical Group Zhejiang Technology Co., Ltd.
Address..... :	DianHou Village, Liushi Town, Yueqing City, Zhejiang P.R. China
Factory..... :	The same as Manufacturer
Address..... :	The same as Manufacturer
Standard..... :	☒ IEC 60269-6:2010+AMD1:2021
Review Report Form No..... :	60269-6
TRF originator..... :	GTS
Master TRF..... :	Reference No. IEC 60269-6:2010+AMD1:2021
Review procedure ..... :	GTS
Type of Review object..... :	Fuse(Low-voltage Fuse for PV System)
Trademark..... :	/
Model/type reference..... :	RT18PV-32; RT18PV-32X; RT18PV-32H; RT18PV-32HX; RT18PV-63; RT18PV-63X; RT18PV-125; RT18PV-125X
Main Model..... :	RT18-32PV 15A
Rating..... :	Ue=1000DC;Ue=1500DC

Possible review case verdicts: - review case does not apply to the test object..... : N(.A.) - review object does meet the requirement..... : P(ass) - review object does not meet the requirement.....: F(ail)
General remarks:
"(see remark #)" refers to a remark appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a comma is used as the decimal separator. The review results presented in this report relate only to the object reviewed. This report shall not be reproduced except in full without the written approval of the third party.

Testing:	
Date of receipt of review item:	November 10,2021
Date(s) of performance of review:	November 10,2021 to November 16,2021

General product information: Fuse(Low-voltage Fuse for PV System)
Summary of reviewing: This review report includes: Annex I: 3 page(s) of photo documentation.
Copy of marking plate

Fuse(Low-voltage Fuse for PV System), Model RT18-32PV 15A Changcheng Electrical Group Zhejiang Technology Co., Ltd.	Marking 

IEC 60269-6			
Clause	Requirement- Test	Result - Remark	Verdict
4	Classification		-
	IEC 60269-1 applies.		P
5	Characteristics of fuses		-
	IEC 60269-1 applies with the following supplementary requirements.		P
5.1	Summary of characteristics		-
5.1.2	Fuse-links		-
	a) Rated voltage (see 5.2) b) Rated current (see 5.3 of IEC 60269-1) c) Rated power dissipation (see 5.5) d) Time-current characteristics (see 5.6) e)Breaking range (see 5.7.1) f) Rated breaking capacity (see 5.7.2) g) Dimensions or size (if applicable) h) Utilization category (see 5.7.1)		P
5.2	Rated voltage		-
	For voltages up to 750 V, IEC 60269-1 applies; for higher voltages, the values should be selected from R5 series or, where not possible, from the R1 0 series of ISO 3.		P
5.5	Rated power dissipation of the fuse-link		-
	In addition to the requirements of IEC 60269-1 , the manufacturer shall indicate the power dissipation as a function of current for the range contained between 70 % to 1 00 % of the rated current.		P
5.6	Limits of time-current characteristics		-
5.6.1	Time-current characteristics, time-current zones		-
5.6.1.1	General requirements		-
5.6.2	Conventional times and currents		-
5.6.2.2	Conventional times and currents for "gPV"-fuse-links		-
	Table 101 – Conventional times and currents for "gPV" fuse-links Rated current A / Conventional time h / Conventional current Type "gPV" I_{nf} / I_f $I_n \leq 63$ — 1 — 1,13 I_n — 1,45 I_n $63 < I_n \leq 160$ — 2 $160 < I_n \leq 400$ — 3 $I_n > 400$ — 4		-
5.6	Gates		-

IEC 60269-6			
Clause	Requirement- Test	Result - Remark	Verdict
	Not applicable.		-
5.7	Breaking range and breaking capacity		-
	IEC60269-1 applies with the following supplementary requirement.		P
5.7.1	Breaking range and utilization category		-
	The first letter indicates the breaking range: – "g" fuse-links (full-range breaking capacity fuse-link). The following letters indicate the utilization category: – "gPV" indicates fuse-links with a full-range d.c. breaking capacity for photovoltaic energy systems.		P
5.7.2	Rated breaking capacity		-
	The rated breaking capacity is based on type tests performed in a circuit containing linear components with mean value of applied voltage. The minimum value of the rated breaking capacity is 1 0 kA d.c.		P
6	Markings		-
	IEC 60269-1 applies with the following supplementary requirements.		P
6.2	Markings on fuse-links		-
	Subclause 6.2 of IEC 60269-1 applies with the following addition: – utilization category “gPV”		P
7	Standard conditions for construction		-
	IEC 60269-1 applies with the following supplementary requirement.		P
7.5	Breaking capacity		-
	A fuse-link shall be capable of breaking, at rated d.c. voltage, any circuit having a prospective current between the conventional fusing current and the rated breaking capacity with time constant not greater than the values specified in Table 1 04.		P
8	Tests		-
	IEC 60269-1 applies with the following supplementary requirements.		P
8.1	General		-

IEC 60269-6			
Clause	Requirement- Test	Result - Remark	Verdict
8.1.4	Arrangement of the fuse and dimensions		-
	The fuse-link shall be mounted open in surroundings free from draughts and, unless otherwise specified, in a vertical position (see 8.3.1).		N/A
8.1.5	Testing of fuse-links		-
	The following Tables 1 02 and 1 03 replaces Tables 1 1 , 1 2 and 1 3 of IEC 60269-1 .		N/A
8.1.5.1	Complete tests		-
8.1.5.2	Type test exemptions for fuse-links of a homogeneous series		N/A
8.3	Verification of temperature rise limits and power dissipation		-
8.3.1	Arrangement of the fuse-link		-
	The fuse-link shall be mounted vertically in the conventional test arrangement. For special fuse-links that cannot be accommodated in the conventional test arrangement, or for which this test arrangement is not applicable, special tests shall be performed according to the manufacturer’ s instructions and all pertinent data shall be recorded in the test report.		N/A
8.3.3	Measurement of power dissipation of the fuse-link		-
	In addition to 8.3.3 of IEC 60269-1 the following applies. The power dissipation test shall be made successively at least at 70 % and at 1 00 % of rated current.		N/A
8.3.5	Acceptability of test results		-
	The temperature rise of the fuse-link shall not exceed the values specified in Table 5 of IEC 60269-1 The power dissipation of the fuse-link shall not exceed the values specified by the manufacturer		N/A
8.4	Verification of operation		-
8.4.1	Arrangement of fuse-link		-

IEC 60269-6			
Clause	Requirement- Test	Result - Remark	Verdict
	The arrangement of the fuse-link for the verification of operation shall be as described in 8.1 .4 and 8.3.1 .		N/A
8.4.3	Test method and acceptability of test results		-
8.4.3.1	Verification of conventional non-fusing and fusing current		N/A
8.4.3.2	Verification of rated current		-
8.4.3.5	Conventional cable overload protection test		N/A
8.4.3.6	Operation of indicating devices and strikers, if any		N/A
	The correct operation of indicating devices is verified in combination with the verification of breaking capacity (see 8.5.5). For verifying the operation of strikers, if any, an additional test sample shall be tested: − at a current of I 5 (see Table 1 04); − at a recovery voltage of 50 V. The value of the recovery voltage may be exceeded by 1 0 %. The striker shall operate during all tests.		N/A
8.5	Verification of the breaking capacity		-
8.5.1	Arrangement of the fuse		-
	In addition to the conditions of 8.1 .4 and 8.3.1 , the following requirement applies. For breaking-capacity tests, the fuse-link shall be mounted and connected the same way as it would be in service.		N/A
8.5.5	Test method		-
8.5.5.1	In order to verify that the fuse-link satisfies the conditions of 7.5, tests number – 1 , 2 and 5 – shall be made. The number of fuse-links requested in Table 1 02 shall be tested with the values stated in Table 1 04. Test nos. 1 and 2 : If, during test no. 1 , the requirements of test no. 2 are met, then this test need not be repeated as test no. 2. Test nos. 5 – The value of test current is specified in Table 1 04.		N/A

IEC 60269-6			
Clause	Requirement- Test	Result - Remark	Verdict
8.5.5.2	For the tests the recovery voltage shall be maintained at a value of $100\ ^{+5}_{0}\ \%$ of the rated voltage for at least: – 30 s after operation of fuse-links not containing organic materials in their body or filler; – 5 min after operation of the fuse-links in all other cases, switching over to another source of supply being permitted after 1 5 s if the switching time (interval without voltage) does not exceed 0,1 s. In a lapse of time of at least 6 min and maximum 1 0 min after the operation, the resistance between the contacts of the fuse-link shall be measured (see 8.5.8 of IEC 60269-1) and noted. With the manufacturer’ s consent, shorter times are possible if the fuse-link does not contain organic materials in its body or filler.		N/A
8.5.8	Acceptability of test results		-
	Fuse-links shall be deemed not to comply with this standard if, during the tests, one or more of the following failures occur: – ignition of the fuse-link, excluding any paper labels or the like used as indicating devices; – mechanical damage to the test arrangement; – mechanical damage to the fuse-link; NOTE Thermal cracking which leaves the fuse-link in one piece is accepted. – burning or melting of end caps; – significant movement of end caps.		N/A
8.11	Mechanical and miscellaneous tests		-
8.1 1.2.4	Verification of freedom from unacceptable levels of thermally induced drift		N/A
8.1 1.2.5	Verification of functionality at temperature extremes		N/A

- - - End of TCF - - -

Type of equipment, model: Fuse(Low-voltage Fuse for PV System),
RT18PV-32; RT18PV-32X; RT18PV-32H; RT18PV-32HX; RT18PV-63;
RT18PV-63X; RT18PV-125; RT18PV-125X

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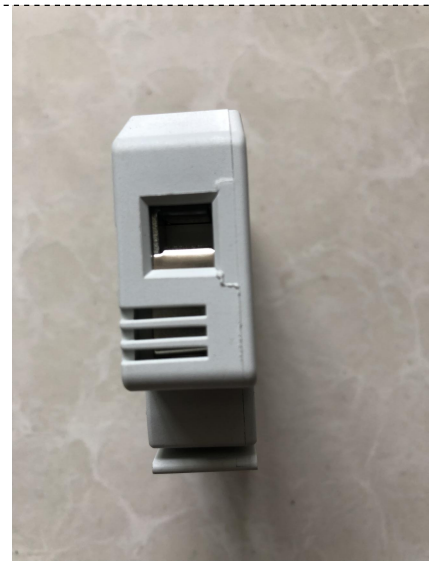
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