DC Fuse For Overcurrent Protection

Of solar photovoltaic system

1, Application

The ATPV type fuses are suitable for lines with rated DC voltage up to 1500V and rated current up to 50A.

It's provide short-circuit protection for

* connected in series and parallel with photovoltaic panels and batteries

* the charging and converter system

* photovoltaic power plants, inverter and rectifier systems

* photovoltaic power generation system surge current

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Operation Temperature: -40°C to 150°C

rated breaking capacity up to 50kA.

It's comply with China national standard GB/T13539.6, IEC60269-6， the International Electrotechnical Commission standard IEC60269-6, and UL248-19

2.Normal working conditions

2.1 The effect of current

The altitude of the installation site should not exceed 2000m (if you want to exceed this 2000m, you need to indicate the requirements, and the company can design and develop according to customer requirements).

PV fuse link derating table for installation

Installation altitude（m）	Percentage of current derating （A）	Percentage of Insulation performance derating（V）
2000	100%	100%
3000	95%	90%
4000	90%	80%
5000	85%	70%

For example: the rated current is 18A and the installation site altitude is 5000m, the actual selection is 18*85%≈15.3A.

2.2 The effect of Voltage

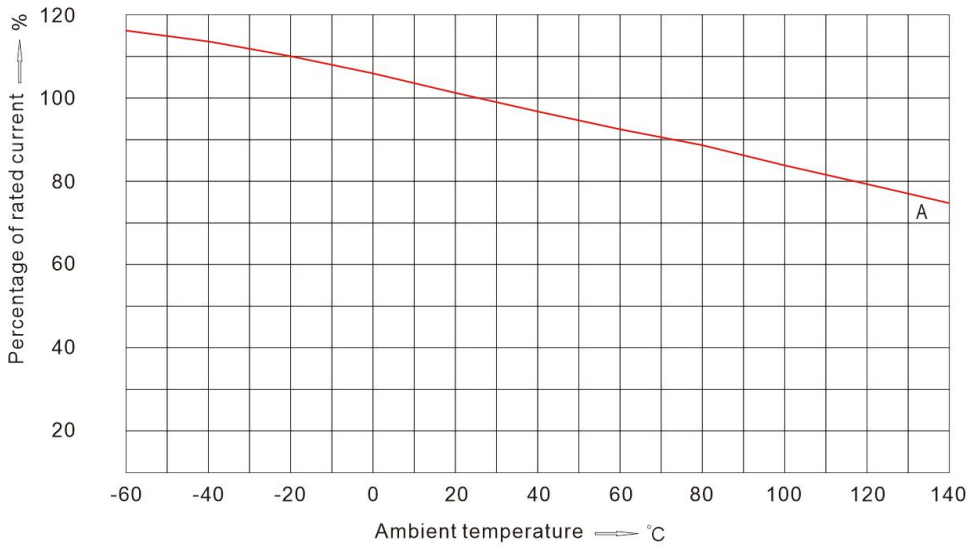
The rated voltage of photovoltaic fuses does not need to be derated for installation altitudes not exceeding 5000m, but it is affected by air pressure on the power frequency withstand voltage and insulation performance to a certain extent. The test voltage of DC 1001-1500V is 3820V, and Our products reach at least 6000V, so here is no need to consider.

2.3 The effect of temperature

The following figure shows a typical curve of the influence of ambient temperature on current carrying capacity:

T (℃)	A
-20	1.09
-10	1.07
0	1.06
10	1.04
20	1.02
30	0.99
40	0.97
50	0.96
60	0.94
70	0.88
80	0.85
90	0.84
100	0.82
110	0.78
120	0.76

Ambient temperature-bearing capacity curve



Curve A: photovoltaic fuse link curve

For example: In some applications, the ambient temperature is 25°C, and the rated current of the photovoltaic (gPV type) fuse is selected as 25A. Now, the above-mentioned fuse is often used in a high temperature environment of 50 ℃, then the fuse must be derated. The environmental bearing capacity curve A in the figure shows that the percentage of the rated operating value at 25°C is 0.96, that is to say, the rated current value of the fuse should be reselected:

$$I'_N = \frac{25A}{0.96} = 26.04$$

If you need derating capacity , please contact us to customized the fuse.

3.Use category

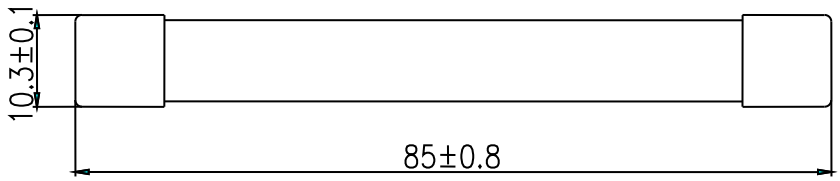
"gPV" refers to a DC fuse with a full range of breaking capacity for overcurrent protection of solar photovoltaic systems.

4.Structural features

The variable cross-section melt made of silver flakes is encapsulated in a high-strength melt tube. The melt tube is filled with chemically treated high-purity quartz sand and special treatment chemicals as the arc extinguishing medium. The welding and the contacts are firmly electrically connected.

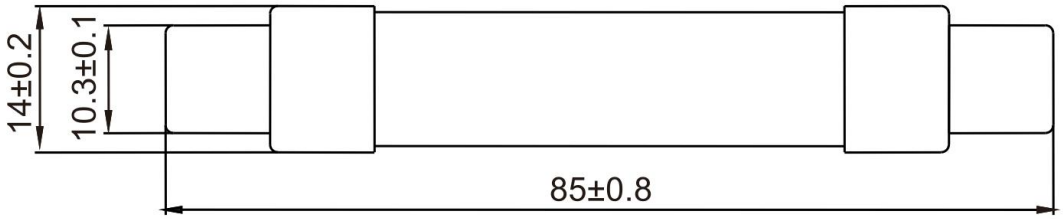
5.The main technical parameters

figure 1



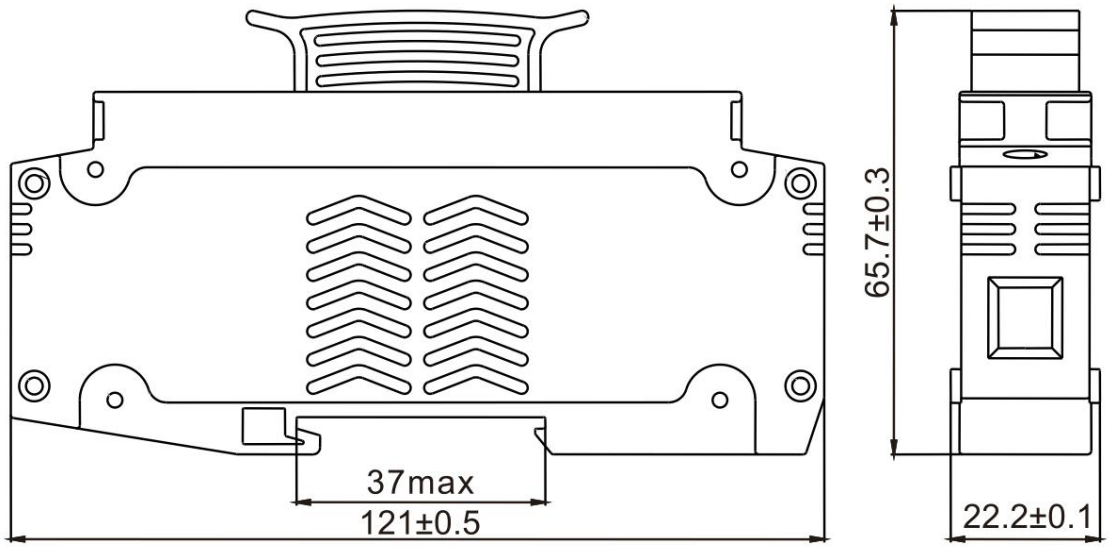
Fuse type gPV	Rated Voltage (V)	Rated Current (A)	Dimensions/Size（mm）		Dissipated power(W)
			Figure No.	D×L	
ATPV-32L	DC1500V	1、2、3、4、5、6、8、10、12、15、16、20、25、30、32、35	1	10×85	≤7.5

figure 2



Fuse type gPV	Rated Voltage (V)	Rated Current (A)	Dimensions/Size（mm）		Dissipated power(W)
			Figure No.	D×L	
ATPV-63L	DC1500V	15、16、20、25、30、32、35、40、45、50A	2	14×85	≤12

figure 2



Fuse base model No.	Equipped with fuse size	Rated Voltage	Rated Current	Dimensions /Size（mm）	Dissipated power(W)	Torque
ATPV-63LD	10×85 14×85	1500 Vdc	50A	See figure 2	≥12.5W	2.5Nm
ATPV-63LDL	10×85 14×85	1500 Vdc	50A	See figure 2	≥12.5W	2.5Nm

Note：ATPV-63LDL is the base with indicating device.

6.Fuse cold resistance and power dissipation

Serial number	Rated current（A）	Pre-arcing I^2t	Total I^2t	1In（W）
1	0.5	5	26	0.9
2	1	10	52	1.1
3	2	19	104	1.3
4	3	29	156	1.5
5	4	38	208	1.8
6	5	47	260	2.1
7	6	57	312	2.5
8	8	75	415	2.8

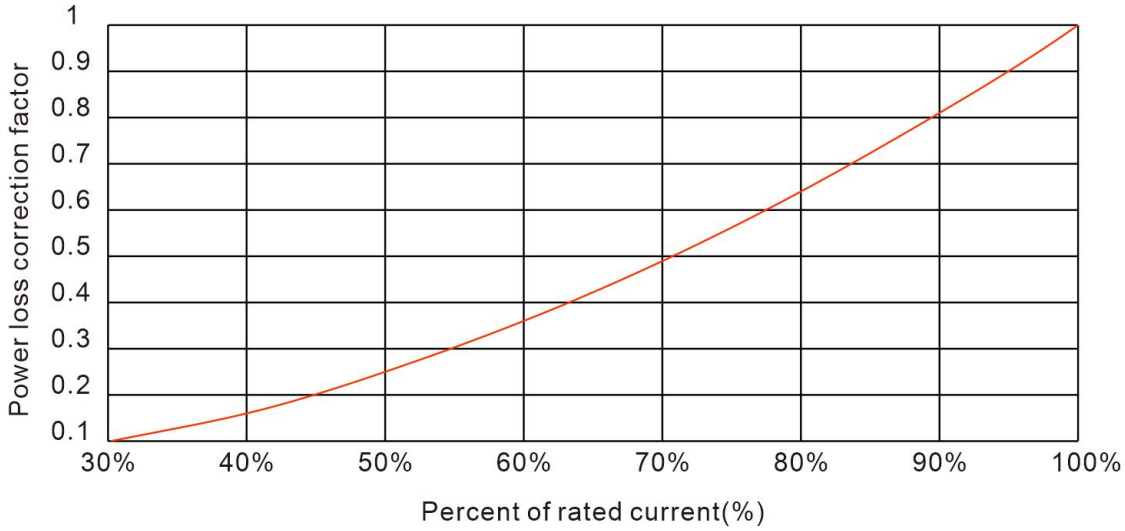
9	10	105	580	3.0
10	12	134	746	3.1
11	15	167	932	3.5
12	16	178	995	4.0
13	20	223	1243	4.5
14	25	279	1550	4.6
15	30	304	2220	5.4
16	32	325	2370	6.2
17	35	390	2844	7.5
18	40	450	3300	7.9
19	45	510	3700	8.2
20	50	570	4200	9.0
21	55	1050	5500	10.0

7.the power loss as per percentage load of 50 % ,60%,80%,90% 100%

Serial number	Rated current（A）	0.5In（W）	0.6In（W）	0.8In（W）	0.9In（W）	1In（W）
1	0.5	0.23	0.33	0.58	0.73	0.9
2	1	0.28	0.40	0.71	0.90	1.1
3	2	0.33	0.47	0.84	1.10	1.3
4	3	0.38	0.54	0.96	1.22	1.5
5	4	0.45	0.65	1.16	1.46	1.8
6	5	0.53	0.76	1.35	1.71	2.1
7	6	0.63	0.9	1.60	2.03	2.5
8	8	0.70	1.01	1.80	2.27	2.8
9	10	0.75	1.08	1.92	2.43	3.0
10	12	0.80	1.12	1.99	2.52	3.1

11	15	0.88	1.26	2.24	2.84	3.5
12	16	1.00	1.44	2.56	3.24	4.0
13	20	1.13	1.62	2.88	3.65	4.5
14	25	1.15	1.66	2.95	3.73	4.6
15	30	1.35	1.95	3.46	4.38	5.4
16	32	1.55	2.24	3.97	5.03	6.2
17	35	1.88	2.7	4.80	6.08	7.5
18	40	1.98	2.85	5.06	6.40	7.9
19	45	2.05	2.96	5.25	6.65	8.2
20	50	2.25	3.30	5.76	7.29	9.0

8.Power Loss Correction Factor Curve



9.Test method

Assigned time, Assigned current

"gPV"Fuse assigned time with current

"gPV"Fuse rated current A	Assigned time h	Assigned Current	
		Inf	If
I_n≤63	1	1.05In(UL)/1.13In(IEC)	1.35In（UL）/1.45In（IEC）
63＜I_n≤160	2	1.13In	1.45In
160＜I_n≤400	3		
I_n＞400	4		

10.Melting characteristic curve