

**PROTECTING
THE WORLD**

PHOTOVOLTAIC

FUSE LINKS & FUSE HOLDERS FOR PHOTOVOLTAIC APPLICATIONS

gPV CYLINDRICAL fuse links

CYL 10x38



10x38

14x51

10x85

10/14x85

22x65



RATED VOLTAGE
1000V DC

RATED CURRENT
1A...20A

BREAKING CAPACITY
30kA

STANDARDS

IEC/EN 60269-1
IEC/EN 60269-6
UL248-1
UL248-19



Cylindrical fuse links for photovoltaic applications

gPV 10x38 cylindrical fuse links from DF Electric have been developed to offer a compact, safety and economic protection of photovoltaic modules (string protection) with voltages up to 1.000V DC.

The range comprises the following fuse links:

→ Size 10x38 1000V DC 1A to 20A

They provide protection against overloads as well as short-circuit (gPV class according to the requirements of IEC60269-6 and UL248-19 Standards).

Made with ceramic tube with high withstand to internal pressure and thermal shock, that allows a high breaking capacity in a reduced physical space.

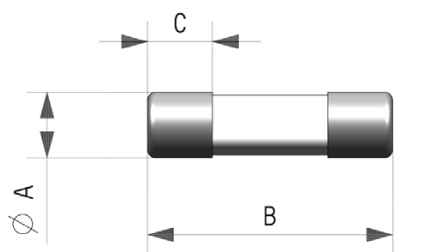
Contacts are made in silver plated copper and melting elements are made in pure silver in order to avoid the aging and thus keep unalterable the electric characteristics.

For these fuse links we recommend the utilization of **10x38 PMX-PV fuse holders**.

UL Listed (File E355019).



Dimensions



A

10,3

B

38

C

10

Weight 8gr

Range

I_n (A)	REFERENCE	PACKING Uni /BOX
1	491601	10/100
2	491602 	10/100
3	491604 	10/100
4	491605 	10/100
5	491606 	10/100
6	491610 	10/100
8	491615 	10/100
10	491620 	10/100
12	491625 	10/100
15	491629	10/100
16	491630	10/100
20	491635	10/100



Technical data

Rated voltage	1000V DC
Rated current	1A...20A
Rated breaking capacity	30kA
Operating class	gPV
Minimum interrupt rating	1A → 1,45·I _n 2A...20A → 1,35·I _n
Non fusing current	1,13·I _n
Storage temperature	-40°C ... 90°C
Operating temperature *	-40°C ... 80°C

* For ambient temperatures higher than 25°C it is necessary to apply a derating in maximum current.

Standards

IEC/EN 60269-1
IEC/EN 60269-6
UL248-1
UL248-19
RoHS Compliant



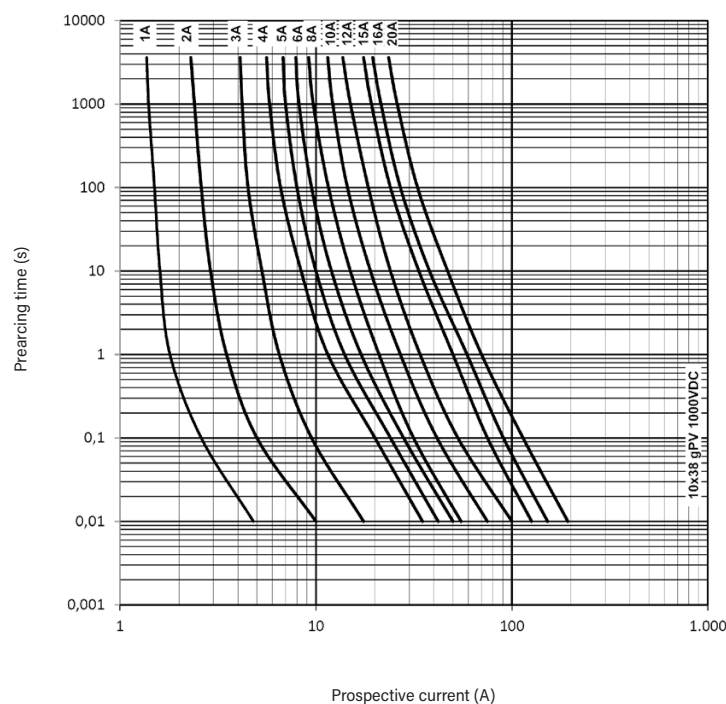
Certifications



Power dissipation

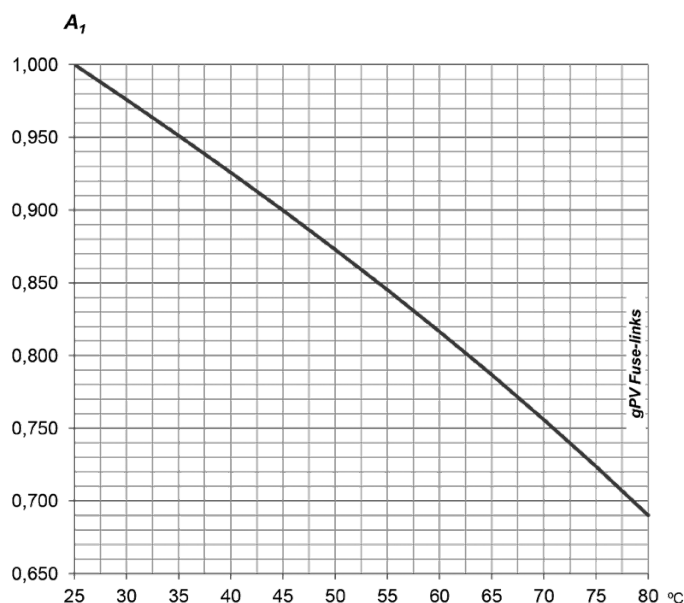
I _n	PREARcing I _t ²	OPERATING I _t ²	POWER DISSIPATION 0,7 · I _n	POWER DISSIPATION I _n
(A)	(A ² S)	(A ² S)	(W)	(W)
1	0,35	1,2	0,31	0,76
2	0,62	1,0	0,78	1,45
3	1,9	3,1	0,66	1,66
4	6,9	11	0,64	1,57
5	14	22	0,60	1,65
6	24	38	0,77	1,84
8	7	17	0,82	2,00
10	15	38	0,94	2,20
12	27	68	0,98	2,40
15	62	115	1,05	2,65
16	89	165	1,10	2,70
20	158	294	1,33	3,20

t-I characteristics





Ambient temperature derating factor



t_a (°C)	A_1
25	1,00
30	0,98
35	0,95
40	0,93
45	0,90
50	0,87
55	0,84
60	0,82
65	0,79
70	0,76
75	0,72
80	0,69

Selection and applications guide

REQUIREMENTS FOR STRING OVERCURRENT PROTECTION

Rated voltage of fuse links

To verify that the rated voltage of fuse link is sufficient, the following points must be taken into account:

- Open circuit voltage $V_{OC\ STC}$ of PV modules.
- Numbers of modules connected in series (M).
- Safety factor (20%) to take into account the rise of open circuit voltage at very low temperatures.

Open circuit voltage $V_{OC\ STC}$ of PV modules is the maximum voltage that a Photovoltaic module can deliver when is working without load, measured under standard test conditions (STC). This information is given by the manufacturer of PV modules.

According to this, rated voltage in DC of fuse links must be:

$$V_{DC_FUSE} \geq V_{OC\ STC} \cdot M \cdot 1,2$$

The 20% safety factor can be avoided with if it can be determined with certainty that under no circumstances the voltage of the installation won't exceed the value of the assigned voltage of the fuses.

Rated current of fuse links

According to the recommendations of IEC 60364-7-712, IEC 62548 and IEC 60269-5 standards, the points to consider when selecting the nominal current of the fuse are:

- Short circuit current of PV modules $I_{SC\ (STC)}$.
- Derating factor for ambient temperature (A_1).

Short circuit current of PV modules $I_{SC\ (STC)}$ is the maximum current that one module can deliver measured under standard test conditions (STC). This data is also given by the manufacturer of PV modules.

It should be applied a derating factor (A_1) as function of ambient temperature.

Rated current of fuse link should be:

$$1,5 \cdot I_{SC_MOD} < I_n \leq 2,4 \cdot I_{SC_MOD}$$

To take into account the ambient temperature correction factor, we shall use the following expression:

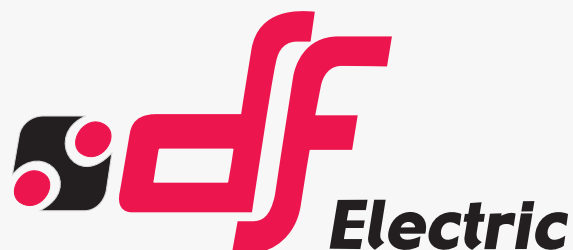
$$1,5 \cdot I_{SC_MOD} < (I_n \cdot A_1) \leq 2,4 \cdot I_{SC_MOD}$$

Where:

I_{SC_MOD} → Short-circuit current of the modules.

I_n → Rated current of fuse link.

A_1 → Derating factor for ambient temperature.



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HEAD OFFICE AND FACTORY

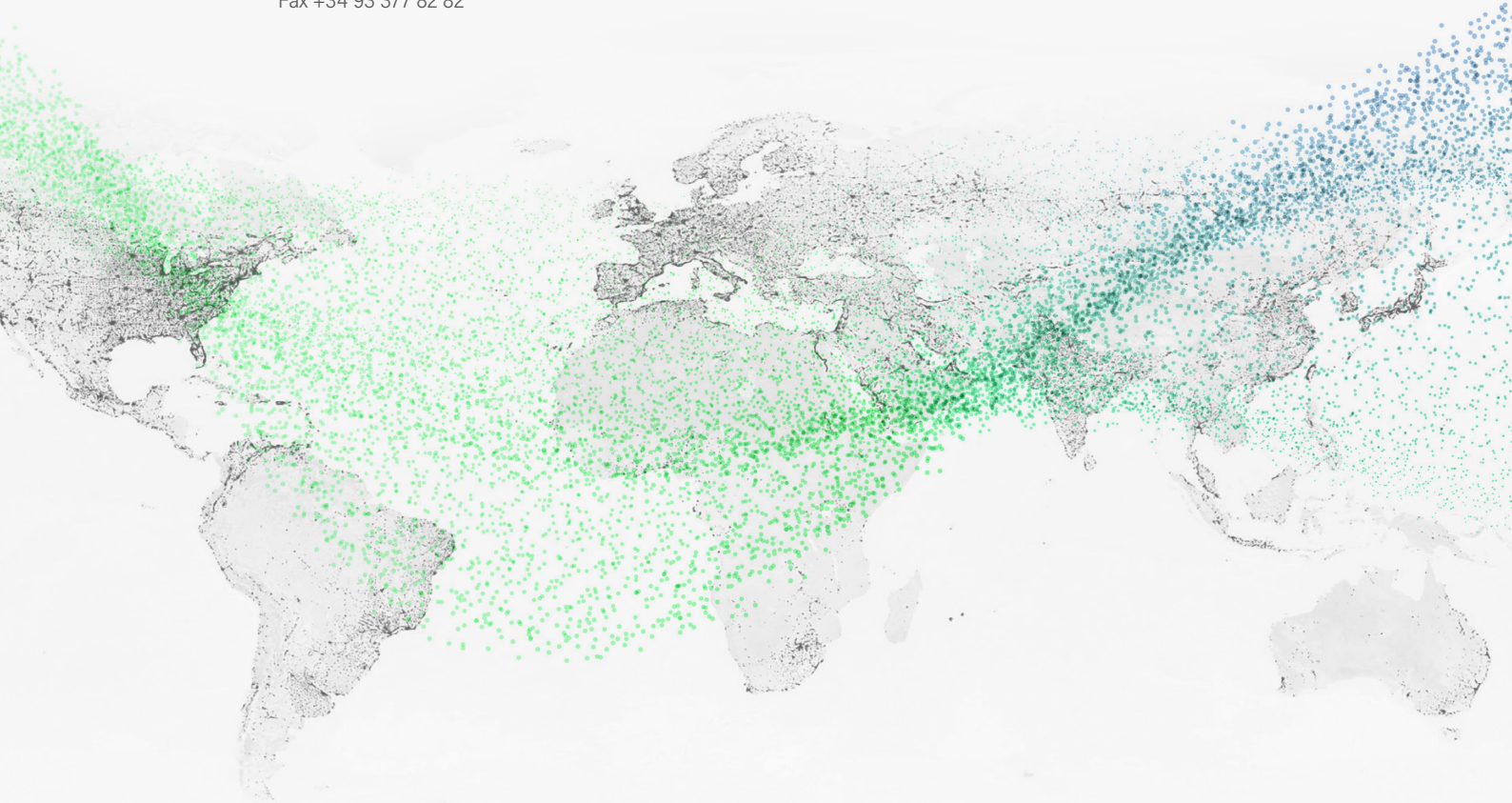
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The "electro technical expert" logo marked on the products included in this data sheet indicates that the installation of these products must be carried out by expert personnel with specialized knowledge.



To prevent electrical hazards, carry out the installation without voltage.



Safety notice
Please capture the following QR code and read our safety notice carefully before installing our products.



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