

Datasheet • FEE-20-12C

5th generation a-Si solar panels



IEC 1646 Certified

Free Energy solar panels are fully certified according to the IEC 1646 standard for amorphous silicon solar panels, by TÜV Rheinland in April/May 2004.

Reliable cell technology

Free Energy produces stable and reliable amorphous silicon cells. After initial stabilization during the first two months of outdoor use, the amorphous silicon cell will be stable for decades.

The expected lifetime of the advanced amorphous silicon solar cells is at least 20 years.

High energy yield

The amorphous silicon solar cells, produced by Free Energy, function better than crystalline silicon solar cells in partial or indirect sunlight. Tests have shown that the annual energy output is approximately 15% higher per rated Watt-peak power.

Outdoor performance

The outdoor performance of amorphous silicon solar panels depends primarily on their protection against corrosion.

Our 5th generation solar panels use an *injected* polymer frame, with a very high moisture barrier. The technology has been developed internally and is unique to the Free Energy products.

*This advanced technology makes our solar panels reliable for outdoor use with **10 years guarantee** on power output.*



free energy europe

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Due to ongoing improvement policy, this documentation is subject to modification without prior notice.

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Specifications

Main characteristics panels

Cell technology	Tandem junction amorphous silicon
Panel technology	5 th generation framing (complies with IE 61646 requirements)
Encapsulation	Glass-to-glass encapsulation with moulded polymer injection framing
Expected lifetime	20 years minimum
Operating conditions	-40 °C to +85 °C

Electrical characteristics - at Standard Test Conditions ¹	Maximum power	Stabilized power
Maximum output power	19 Watt peak	16 Watt peak
Maximum current at 16 V	1.18 Ampere	0.99 Ampere
Short circuit current	1.45 Ampere	1.22 Ampere
Open circuit voltage	22.8 Volts	22.8 Volts

1) Data refers to Standard Test Conditions (STC), an approximation of operation in full sunlight (STC: 1000 W/m² irradiance, 25 °C cell temperature, spectrum AM 1.5). Rated parameters may vary +/- 10%.

Electrical characteristics - at Average Operating Conditions² Stabilized power

Equivalent yield peak power	18 Watt peak
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2) Data refers to real annual average irradiation in the Netherlands, normalized on average performance of crystalline silicon technology. Rated parameters may vary +/- 10%.

Temperature coefficients

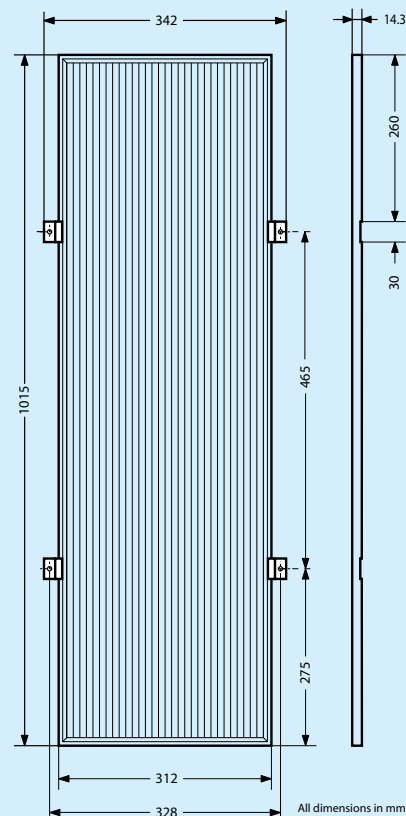
Voltage	- 0.29% / °C
Current	+ 0.08% / °C
Normal operating cell temperature	45 °C (at 800 W/m ² , ambient temperature 21 °C)

Dimensions

Dimensions (HxW)	1015 mm x 312 mm
Thickness	14.3 mm
Weight	4.6 kg

Connections

Cable	1 m double insulated cable (2 x 0.75 mm ²)
Polarity	Brown = +, Blue = -
Fixing	4 clips for easy installation
Maximum system voltage	50V DC



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