

Datasheet • Solar Panels

4th generation a-Si solar panels

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

Free Energy applies an *injected* polymer frame, with a very high moisture barrier. This advanced framing technology is unique to the Free Energy solar panels and makes them reliable for outdoor use with **10 years guarantee** on power output.



Free Energy solar panel product range:

- 5 Watt solar panel • FEE-5-12
- 7 Watt solar panel • FEE-7-12
- 14 Watt solar panel • FEE-14-12
- 19 Watt solar panel • FEE-20-12

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	FEE-20-12	FEE-14-12	FEE-7-12	FEE-5-12
Cell technology	tandem aSi	single aSi	single aSi	single aSi
Module framing	4 th generation	4 th generation	4 th generation	4 th generation
Encapsulation	Glass-to-glass encapsulation with moulded polymer injection framing.			
Expected lifetime	> 20 years			
Operating conditions	-40 °C to +85 °C			

Maximum power electrical characteristics

<i>at Standard Test Conditions¹</i>	FEE-20-12	FEE-14-12	FEE-7-12	FEE-5-12
Maximum peak power	19 Watt	14 Watt	7 Watt	5 Watt
Maximum current at 16V	1.18 Ampere	0.87 Ampere	0.43 Ampere	0.29 Ampere
Short circuit	1.45 Ampere	1.05 Amp	0.52 Ampere	0.35 Ampere
Open circuit	22.8 Volt	22.0 Volt	22.0 Volt	22.0 Volt

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%.

Stabilized electrical characteristics

<i>at Standard Test Conditions¹</i>	FEE-20-12	FEE-14-12	FEE-7-12	FEE-5-12
Stabilized peak power	16 Watt	12 Watt	6 Watt	4 Watt
Current at 16V	0.99 Ampere	0.75 Ampere	0.38 Ampere	0.25 Ampere
Short circuit current	1.22 Ampere	0.90 Ampere	0.45 Ampere	0.30 Ampere
Open circuit voltage	22.8 Volt	22.0 Volt	22.0 Volt	22.0 Volt

2) 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%.

Stabilized electrical characteristics

<i>at Average Operating Conditions³</i>	FEE-20-12	FEE-14-12	FEE-7-12	FEE-5-12
Peak power	18 Watt	14 Watt	6.9 Watt	4.6 Watt

3) Data refers to real annual average irradiation in the Netherlands, normalized on average performance of crystalline silicon technology. Rated parameters may vary +/- 10%.

Dimensions	FEE-20-12	FEE-14-12	FEE-7-12	FEE-5-12
Dimensions (H X W)	1015 x 312 mm	930 x 317 mm	495 x 317 mm	343 x 317 mm
Thickness	14.3 mm	12.5 mm	12.5 mm	12.5 mm
Weight	4.6 kg	4.1 kg	2.1 kg	1.5 kg
Fixation	4 clips	4 clips	4 holes	4 holes

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)

Special options (on request)

- 6 Volt version
- 5 m cable
- premounted special connectors

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