



PHOENIX SOLAR - PHX-128/135

Solar modules are the key element of every solar power system as they convert sunlight into electricity. Their quality and the optimum use of the respective technology are therefore decisive for the yield and profit of your system. Solar modules based on thin-film technology absorb a particularly wide spectrum of sunlight. This enables the effective use of solar power – even under less than ideal sunlight conditions.

Phoenix Solar selects the best respective solar modules from leading international manufacturers based on strict quality criteria. They are continuously tested by their own experts as well as independent institutes. This provides you with the security to make your investment as effective as possible while optimising your return at the same time.



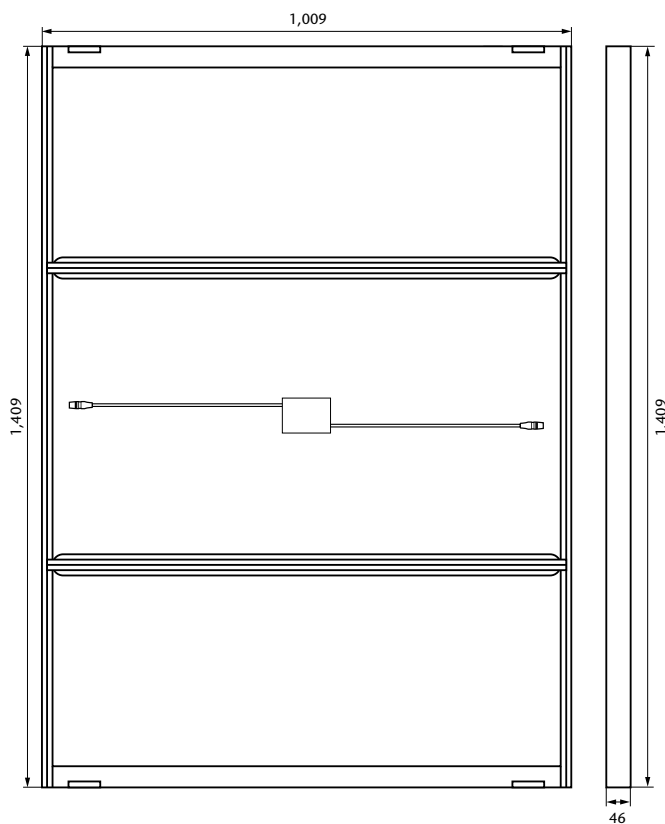
The advantages at a glance:

- 128 and 135 Wp output
- Tested in a RAL certificated process, independent of the manufacturer
- Amorphous/microcrystalline high-performance modules with an efficiency of up to 9,5 %
- 25-year performance guarantee* based on 80 % of the minimum performance
- 10-year performance guarantee* based on 90 % of the minimum performance
- Extremely robust, non-corroding aluminium frame
- Attractive appearance with silver frames

* Our terms and conditions of guarantee apply

Experience that pays

Phoenix Solar or your local Phoenix Solar partner individually match the solar modules and all additional system components to ensure that you get the ideal system to meet your requirements. All of our sales partners have a considerable amount of expertise and many years of experience in solar technology and have been personally chosen by us according to the strictest quality criteria.



Mechanical parameters

Length [mm]	1,409 ± 3
Width [mm]	1,009 ± 3
Depth [mm]	46 ± 0.8
Depth with connection socket [mm]	46
Weight [kg]	19
Connection socket (manufacturer/material/number of diodes)	Alloy/Poly Phenylene Oxide/1
Positive cable (manufacturer/length [mm]/cable cross-section [mm ²])	M-Onamba/900 (± 30)/2.5
Negative cable (manufacturer/length [mm]/cable cross-section [mm ²])	M-Onamba/900 (± 30)/2.5
Plug connector (manufacturer/type)	Multicontact/MC3
Front cover (material/thickness [mm])	Low-iron glass/4.0
Cell type (quantity/technology)	45/a-Si/μ-Si
Cell embedding (material)	Ethyl Vinyl Acetate (EVA)
Rear cover (material)	Foil
Frame (material/profile type)	Aluminium/hollow section

Manufacturer's guarantee

Product guarantee	5-year product guarantee
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Performance guarantee 10 years at 90 % of the minimal rated power output*
 25 years at 80 % the minimal rated power output*

* Our terms and conditions of guarantee apply

Qualifications and Certificates

IEC 61646

IEC 61730



Located in Sulzemoos near Munich, Germany, Phoenix Solar AG is an international leading photovoltaic systems company. Many years of experience in planning, constructing and operating large-scale photovoltaic power plants in combination with a quality management system involving independent laboratories make the company's products and systems a secure capital investment.



Electrical parameters

Electrical parameters for STC ($T_{\text{Module}} = 25 (+/-2)^{\circ}\text{C}$. AM 1.5 according to EN/IEC 60904-3) stabilised conditions

Article number	100995		100997	
Power output [P_{mpp}]	128		135	
Power output tolerances [%]	+10/-5		+5/-5	
Efficiency [%]	9.00		9.50	
	stable	initial	stable	initial
Max. power output P_{mpp} [Wp]	128	150	135	158.9
Max. voltage V_{mpp} [V]	45.4	48.6	47.0	49.7
Max. current I_{mpp} [A]	2.82	3.10	2.88	3.20
Open circuit voltage V_{oc} [V]	59.8	60.8	61.3	62.5
Short circuit current I_{sc} [A]	3.45	3.54	3.41	3.49

Electrical parameters for 800 W/m^2 , NOCT, AM 1.5 according to EN/IEC 60904-3

NOCT = Nominal Operating Cell Temperature, cell temperature under nominal operating conditions

Max. power output P_{mpp} [Wp]	97.00	103.40
Max. voltage V_{mpp} [V]	42.30	44.90
Max. current I_{mpp} [A]	2.29	2.31
Open circuit voltage V_{oc} [V]	55.70	57.10
Short circuit current I_{sc} [A]	2.79	2.80

Reverse current loading capability I_{R} [A]	Requires use of string diodes
Max. permissible system voltage V_{sys} [V]	1,000

Parameters for the thermal characteristics

NOCT [$^{\circ}\text{C}$]	44
Temperature coefficient of the short circuit current I_{sc} [%/K]	+ 0.07
Temperature coefficient of the open circuit voltage V_{oc} [%/K]	- 0.30
Temperature coefficient of the MPP power P_{mpp} [%/K]	- 0.24

Operating conditions

Max. operating temperature [$^{\circ}\text{C}$]	- 40 to + 90
Max. snow load [Pa]	2,400
Max. wind load [Pa]	2,400

PLANNING GUIDE

The module array displayed below applies specifically to Phoenix Solar PHX128/135 modules, including the distances for connecting them together (using the Tecto-Sun mounting system, scale: 1:100).

Notes on use: Draw a scale diagram of the roof (1:100) with all the details (windows, dormer windows, chimneys,

etc.) on transparent paper and place it over this module array. Copy the intersecting points of the grid on the roof diagram and connect them with a line. If the roof diagram is larger than the grid, it can be moved as required. Doing this allows you to determine the maximum allocation of modules while taking shading and objects on the roof into account.

Number of modules	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Module array dimensions	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00
1																
1.40																
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2.80																
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4.20																
4																
5.60																
5																
7.00																
6																
8.40																
7																
9.80																
8																
11.20																

Length (m) Width (m)

Subject to modifications and errors