



YINGLI SOLAR – YL230P-29b-1

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. Polycrystalline solar modules provide reliable experience based on more than 40 years of use and continuously deliver excellent yields.

Phoenix Solar selects the best solar modules from leading international manufacturers based on strict quality criteria. They are tested by our own technical experts as well as independent institutes. This provides you with investment security whilst optimising your return at the same time.



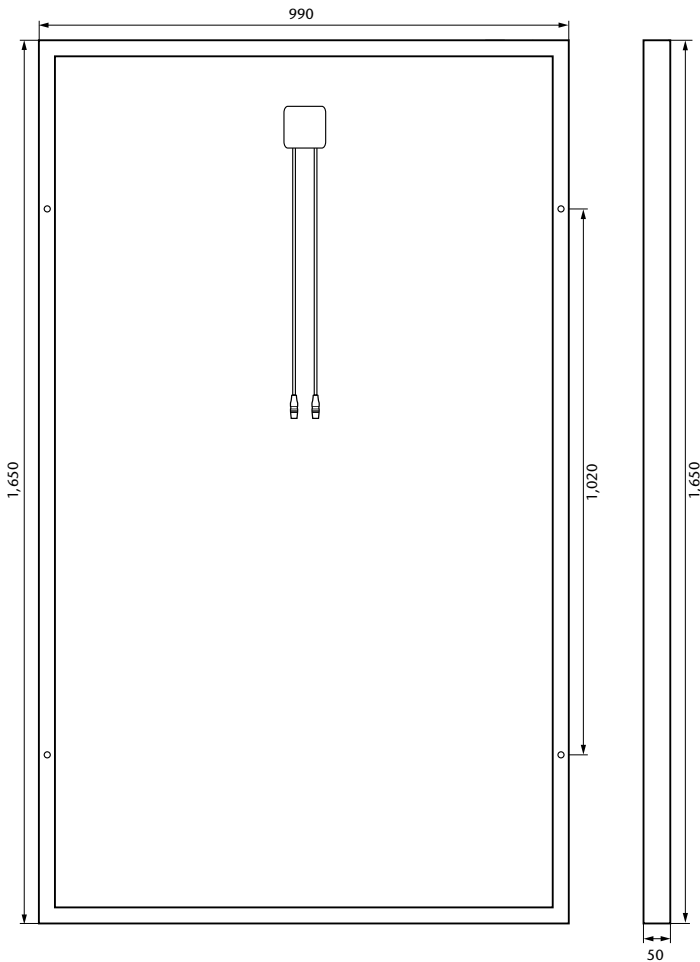
The advantages at a glance:

- 230 Wp power output available
- Tested in a RAL certificated process, independent of the manufacturer
- Polycrystalline high-performance modules with an efficiency of 14%
- 25-year performance guarantee* at 80% of the minimal rated power output
- 10-year performance guarantee* at 90% of the minimal rated power output
- Robust, non-corroding aluminium frame and tempered glass for extreme climate conditions

* The manufacturer's guarantee conditions 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]	1,650
Width [mm]	990
Depth [mm]	50
Depth with connection socket [mm]	50
Weight [kg]	19.8
Connection socket (manufacturer/material/number of diodes)	QC/0506-1/3
Positive cable (manufacturer/length [mm]/cable cross-section [mm ²])	QC/1,200/4
Negative cable (manufacturer/length [mm]/cable cross-section [mm ²])	QC/1,200/4
Plug connector (manufacturer/type)	MultiContact/MC4
Front cover (material/thickness [mm])	Tempered glass/3.2
Cell type (quantity/technology)	60/polycrystalline
Cell embedding (material)	Ethyl Vinyl Acetate (EVA)
Rear cover (material)	PET/PVDF
Frame (material/profile type)	Aluminium with hollow profile

Manufacturer's guarantee

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

* The manufacturer's guarantee conditions apply

Qualifications and Certificates

IEC 61215 Ed. 2

IEC 61730 Class A



Yingli Solar is one of the leading PV solar module manufacturers in China. The company is rapidly expanding its production volume and is vertically integrated from ingots through to module manufacturing. Yingli Solar modules have already demonstrated their high performance and reliability in several large MW projects in Germany.



Electrical parameters

Electrical parameters for STC (1,000 W/m², T_{Module} = 25 (+/-)°C, AM 1.5 according to EN/IEC 60904-3)

Article number	103009
Power output [P _{mpp}]	230
Power output tolerances [%]	+/- 3
Efficiency [%]	14
Max. voltage V _{mpp} [V]	29.5
Max. current I _{mpp} [A]	7.80
Open circuit voltage V _{oc} [V]	37.0
Short circuit current I _{sc} [A]	8.4

Electrical parameters for 800 W/m², 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]	166.6
Max. voltage V _{mpp} [V]	26.5
Max. current I _{mpp} [A]	6.28
Open circuit voltage V _{oc} [V]	33.8
Short circuit current I _{sc} [A]	6.8
Reverse current loading capability I _R [A]	15
Max. permissible system voltage V _{sys} [V]	1,000

Parameters of the thermal characteristics

NOCT [° C]	46+/-2
Temperature coefficient of the short circuit current I _{sc} [%/K]	0.06
Temperature coefficient of the open circuit voltage V _{oc} [%/K]	-0.37
Temperature coefficient of the MPP power P _{mpp} [%/K]	-0.45

Operating conditions

Max. operating temperature [° C]	-40 to +85
Max. snow load [Pa]	5,400
Max. wind load [Pa]	2,400

PLANNING GUIDE

The module array displayed below applies specifically to Yingli Solar YL230P-29b-1 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
Module array dimensions	1.01	2.02	3.03	4.04	5.05	6.06	7.07	8.08	9.09	10.1	11.13	12.14	13.15	14.16
1														
2														
3														
4														
5														
6														
7														