

TRINA SOLAR – TSM210DC05 / TSM220DC05

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. Monocrystalline 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.



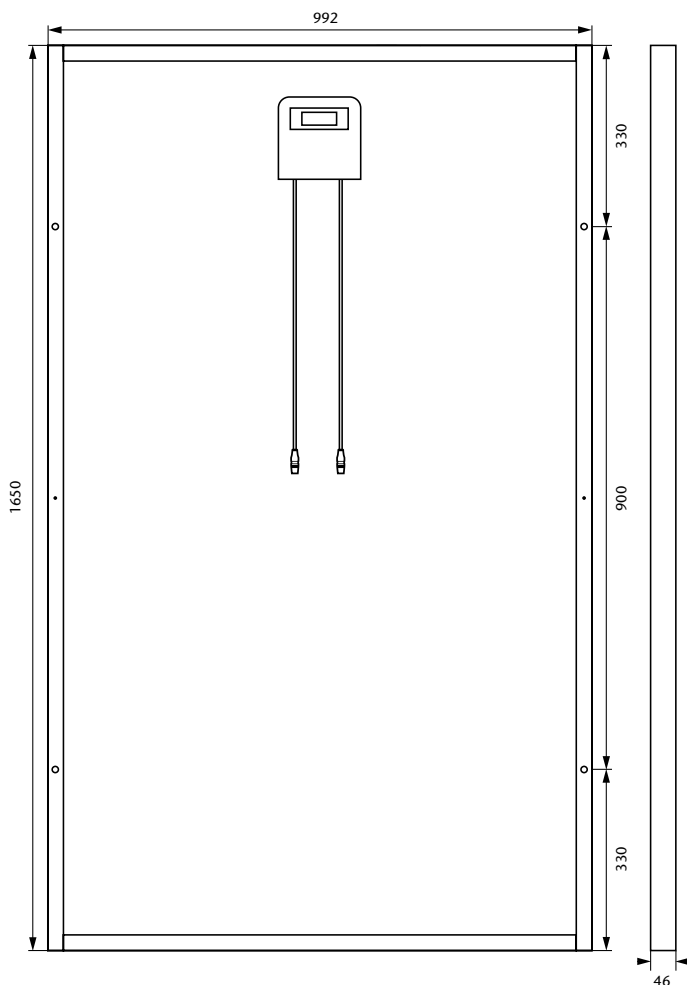
The advantages at a glance:

- 210 Wp and 220 Wp power output available
- Tested in a RAL certificated process, independent of the manufacturer
- Monocrystalline high-performance modules with an efficiency of up to 13.4%
- 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
- Tempered glass provides protection from hail, snow, ice, and storm
- Low module weight for easy installation and no static loading problems on the roof

* The manufacturer's warranty 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]	1650
Width [mm]	992
Depth [mm]	46
Depth with connection socket [mm]	46
Weight [kg]	19.5
Connection socket (manufacturer/ number of diodes)	ZJRH/6
Positive cable (manufacturer/length [mm]/ cable cross-section [mm ²])	ZJRH/1000/4
Negative cable (manufacturer/length [mm]/ cable cross-section [mm ²])	ZJRH/1000/4
Plug connector (manufacturer/type)	Multicontact/ MC4-compatible
Front cover (material/thickness [mm])	Glass/3.2
Cell type (quantity/technology)	60/monocrystalline
Cell embedding (material)	Ethylene vinyl acetate (EVA) with edge seal
Rear cover (material/thickness [mm])	PTL 3-25-300HR
Frame (material/profile type)	Aluminium/ hollow section

Warranties

Product warranty	2-year product limited warranty*
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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*

* The manufacturer's warranty conditions apply

Qualifications and Certificates

IEC 61215 Ed. 2

IEC 61730



Trina Solar was founded in 1997 in China, and is thus one of its country's photovoltaic pioneer companies. This solar module manufacturer follows a vertically integrated business model, with production of monocrystalline ingots, through to the finished solar modules. This enables Trina Solar to perfectly monitor the quality of its products in all levels of manufacture.



Electrical parameters

Electrical parameters for STC (1000 W/m², 25 (+/- 2)°C, AM 1.5 according to EN 6090-4)

Article number	100727	100728
Power output [P_{mpp}]	210	220
Power output tolerances [%]	+/- 3	+/- 3
Efficiency [%]	12.83	13.40
Max. voltage V_{mpp} [V]	29.20	29.80
Max. current I_{mpp} [A]	7.19	7.39
Open circuit voltage V_{oc} [V]	36.40	36.80
Short circuit current I_{sc} [A]	7.86	8.00

Electrical parameters for 800 W/m², NOCT, AM 1.5 NOCT = Nominal Operating Cell Temperature, cell temperature under nominal operating conditions

Max. power output P_{max} [Wp]	151.40	158.60
Max. voltage V_{max} [V]	26.80	27.20
Max. current I_{mpp} [A]	5.66	5.82
Open circuit voltage V_{oc} [V]	33.30	33.60
Short circuit current I_{sc} [A]	6.36	6.47
Reverse current loading capability I_R [A]		2 x I_{sc}
Max. permissible system voltage V_{max} [V]		1000

Efficiency variance from 1000 W/m² to 200 W/m² ($T_{module} = 25^\circ C$), + 2 (increase!)

Parameters of the thermal characteristics

NOCT [° C]	47
Temperature coefficient of the short circuit current I_{sc} [%/K]	+ 0.05
Temperature coefficient of the open circuit voltage V_{oc} [%/K]	- 0.35
Temperature coefficient of the MPP power P_{mpp} [%/K]	- 0.45

Operating conditions

Max. operating temperature [° C]	- 40 to + 85
Max. snow load [Pa]	2400
Max. wind load [Pa]	according to IEC 61215

Subject to modifications and errors

PLANNING GUIDE

The module array displayed below applies specifically to Trina Solar TSM210DC05 / TSM220DC05 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
Module array dimensions	0.99	2.00	3.01	4.02	5.03	6.04	7.05	8.06	9.07	10.08	11.09	12.1	13.11	14.12	15.13

	Length (m)	Width (m)														
1	1.65															
2	3.3															
3	4.95															
4	6.6															
5	8.25															
6	9.9															
7	11.55															

Subject to modifications and errors

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Making energy together