

Photovoltaic modules

TE290/310-72M+

- ▶ High efficiency, reduced area, positive power classification

Tenesol manufactures its own photovoltaic modules in two facilities.

Tenesol's modules use the **high-output technology of the monocrystalline cell**. Each cell is individually measured and sorted before the encapsulation stage.

The combined use of **tempered glass, EVA and back sheet** keeps its weight to a minimum. The laminate **guarantees total watertightness** and long-term protection of the cells.

The **reinforced 50 mm aluminium** frame makes handling easy and allows for quick, easy and **highly resistant assembly**.

Each module is subject to an **individual quality control process**.

Product warranty: 10 years

Power warranty: 25 years*



The quality of TENESOL modules are CE certified.



Our production facilities are also certified according to ISO 9001 and ISO 14001 standards.

About Tenesol

A rapidly expanding global player in the field of solar energy (with an estimated turnover of €200 million in 2011) Tenesol works on behalf of businesses, local authorities and private individuals. For more than 28 years, the company has been engineering, designing, manufacturing, installing and operating solar energy systems. Its services cover systems that produce or consume the energy they generate (off-grid sites, electricity grid connected, solar water heating) for customers around the globe. A benchmark player in its sector, Tenesol currently has a staff of more than 700 employees across 18 subsidiaries including two production facilities, one in Toulouse, France, and the other in Cape Town, South Africa. In January 2012, Tenesol was acquired by SunPower (NASDAQ: SPWR), a manufacturer of highest efficiency solar cell, solar panels and solar systems. SunPower is headquartered in San Jose, Calif., with offices in North America, Europe, Australia and Asia.

For more information, please visit: www.tenesol-group.com .



Sun access provider.

TENESOL

A SUNPOWER COMPANY

► TE290/310-72M+

Electrical characteristics TE290/310-72M+

Nominal Power	Wp	290	300	310 ¹
Minimum power		290	300	310 ¹
Maximum power		295	305	315
Sorting limits	Wp	-0/+5		
Sorting limits	%	1.7		
Voltage at max. power	(V)	35.65	36	36.3
Current at max. power	(A)	8.2	8.4	8.6
Open circuit voltage	(V)	44.8	45.05	45.35
Short circuit current	(A)	8.6	8.8	9

According to specifications at STC: Irradiation 1000 W/m²; AM 1.5; Cell at ambient Temperature T: 25°C.
(1) : Module available upon request

Nominal Power 45°C/800W/m ² Wp		215.8	223.4	230.8
Voltage at max. power	(V)	32.5	32.9	33.2
Current at max. power	(A)	6.6	6.8	7.0
Open circuit voltage	(V)	41.7	41.9	42.2
Short circuit current	(A)	7.0	7.1	7.3

NOCT tests realized with a maximum power (in Wp), junction temperature 45 °C; irradiation 800 W/m²; Am 1,5 ; Ambient temperature 20 °C; Windspeed 1 m/sec.

Temperature coefficients	
Temperature Coefficient of Voltage	- 154,8 mV/°C
Temperature Coefficient of Current	+ 4,8 mA/°C
Temperature Coefficient of Power	- 0,43 %/°C
NOCT	45 °C

Cells	
Size	156 x 156mm
Layout	72 cells / 6 x 12
Type	Monocrystalline

General information	
Maximum system voltage	1000 V
Maximum reverse current	18 A
Type of connection	Amphenol
Diodes	3 by-pass
Junction Box	IP55
Weight	22.5 kg
Operating ambient temperature	-40 / +85°C

Certifications	
	IEC 61215 + IEC61730

Warranty	
Product warranty	10 years
Power warranty (*)	25 years - 80 % of minimal power 10 years - 90 % of minimal power

Irradiant dependency			
Irradiation W/m ²	Pm	Vpm	Ipm
1000	1	1	1
800	0.799	0.999	0.8
500	0.497	0.994	0.5
400	0.394	0.986	0.4
300	0.291	0.97	0.3
200	0.187	0.936	0.2
100	0.086	0.862	0.1

