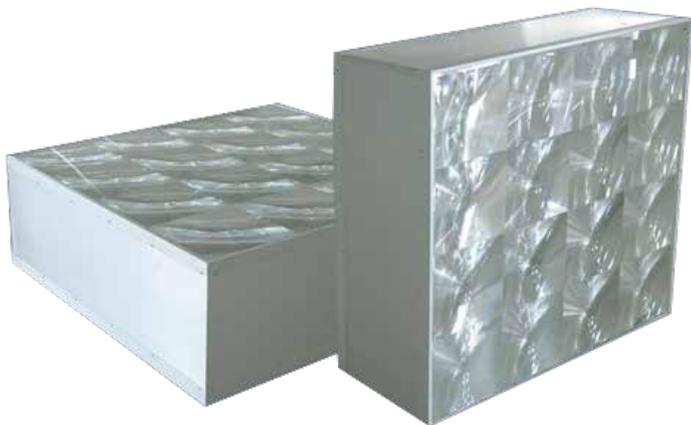
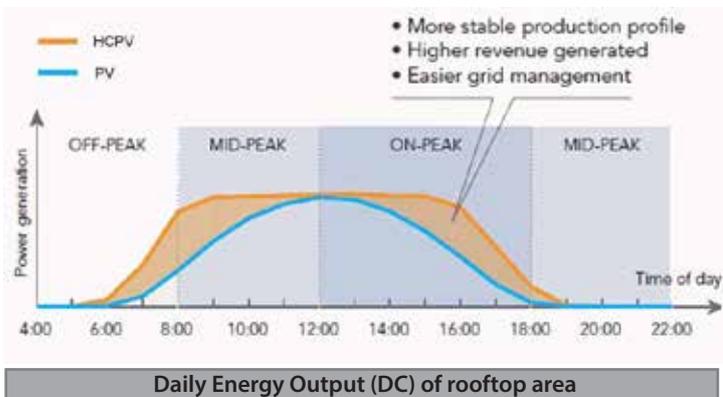


Since 2012 that Havenergy is a trademark of Planetapelativo, a Portuguese company dedicated to the research, manufacture, commercialization and maintenance of new solutions that increase energy efficiency, reduce environmental impacts, as well as the cost associated to energy consumption.

Being oriented to the solar, wind, biomass and hydric energy, the company started for installing and doing the maintenance of solar systems and wind turbines from small to large production in Portugal.

According to the purposes of the company, Havenergy decided to develop its own high concentrated photovoltaic panel in order to improve the actual solar systems and to provide the best solutions to their customers worldwide.



Solar Cell Characteristics	
Cell Type	Gallium Arsenide / Triple Junction Solar Cell
Cooling System	Passive Convection cooling with aluminium heat-sink
Cell Size	5,5 (mm)x 5,5 (mm)
Temperature Coefficient	-0.12% /°C

Module Specifics	
<b>HCPV Module power rating (STC)</b>	300 WpDC (1)
Cell-Units per module	30
Power per cell-unit	30WpDC (1)
DC Efficiency	29%
Acceptance tracking angle	1.7°
Total Area (m <sup>2</sup> )	1.08
Total Weight (Kg)	41
<b>Dimensions (m)</b>	
Length	1.14
Width	0.95
Height	0.29

Electrical Specifications	
Vmp (V, nominal)	38.1
Imp (A, nominal)	10.7
Voc (V, nominal)	45.1
Isc (A, nominal)	11.4

Tracker	
Operable global latitude range	45°S - 45°N
<b>Range of motion</b>	
Azimuth	160°W from South
Elevation	0° - 120° from horizon
Elevation drivemotor	Single stepper motor
Azimuth drive motor	Single stepper motor
Tracking algorithm	Module level power maximization
Tracking accuracy (incl. Backlash)	0.3°

Installation & Environment	
Ambient operating temperature	-30°C to 55°C
Power connectivity	Junction box at tracker frame
Inverter compatibility	Compatible with standard IUL 1741 Listed grid tie DC/AC inverter
<b>Installation zoning</b>	
Wind	Wind exposure D - Max 90 mph (145 Kph)
Seismic	Seismic Zone 4

\* STC: Standard Test Conditions at the Factory (+/- 10%) | Irradiance: 850 W/m<sup>2</sup> ASTM 173 Direct Normal Spectrum | Tcell = 25°C

## HCPV Solar Trackers

Havenergy also manufactures high precision solar tracker arrays according to the solution for your project. The solar tracker could be applied to residential, industrial or other kind of projects, and it will certainly improve the energy efficiency of the HCPV system.

Havenergy trackers have an active positioning controlled by to axis motor which provides its rotation and elevation and high resolution system that monitors the sun position and moves the tracker to the ideal position in order to improve until 45% the efficiency of the solar system.

This active position is possible due to the axes disposed on the tracker providing its rotation and elevation.