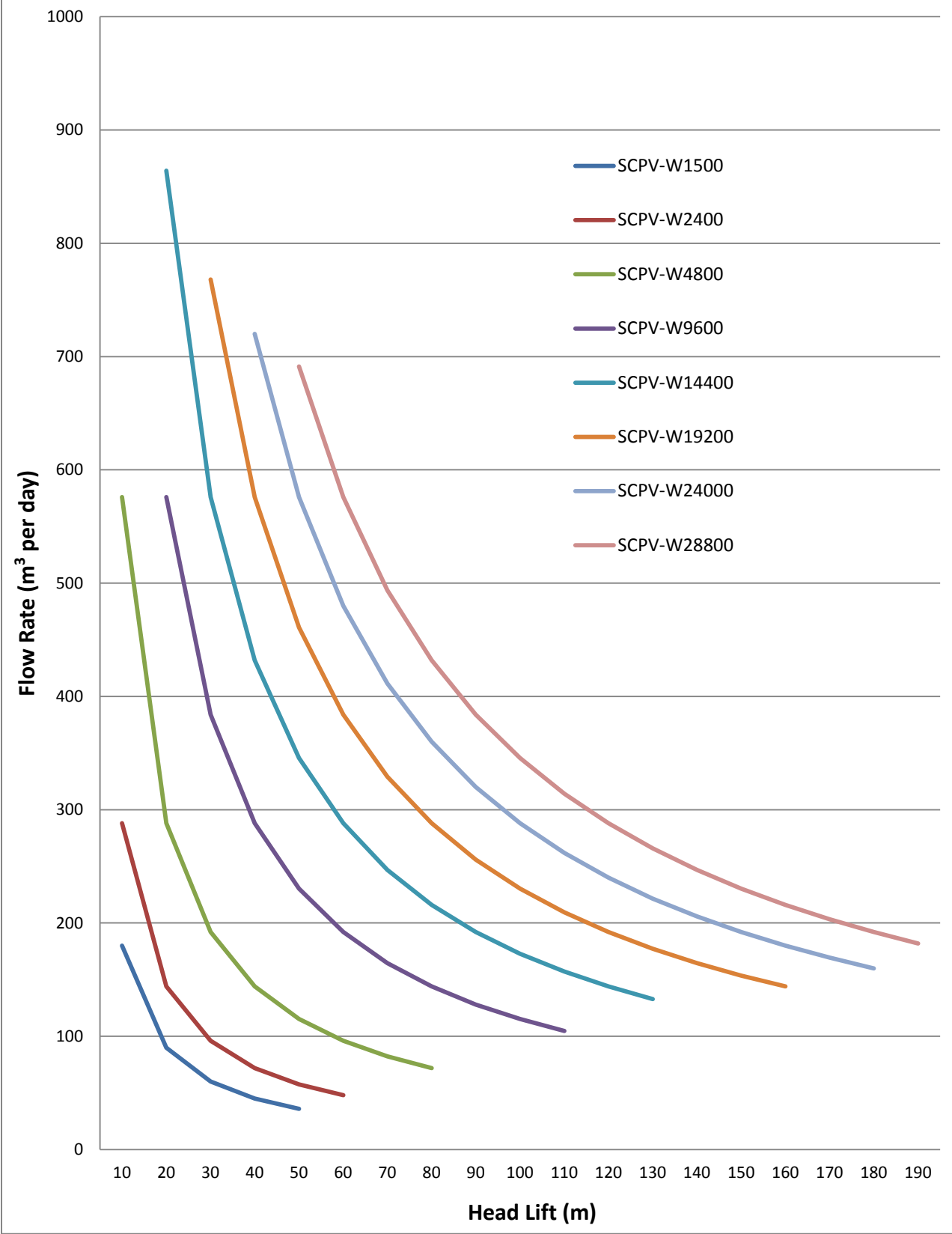


## Silicon CPV Solar Water Pumping System Selection



Customer confirms the required head lift and water flow rate per day.  
The "X" axis defines head lift and the "Y" axis defines daily water flow rate. Select the system defined at "X" and "Y" cross point.  
Silicon CPV will then design detailed specification according to the selected model, the local irradiation and climate condition.



Silicon CPV<sub>plc</sub>

## SOLAR WATER PUMPING



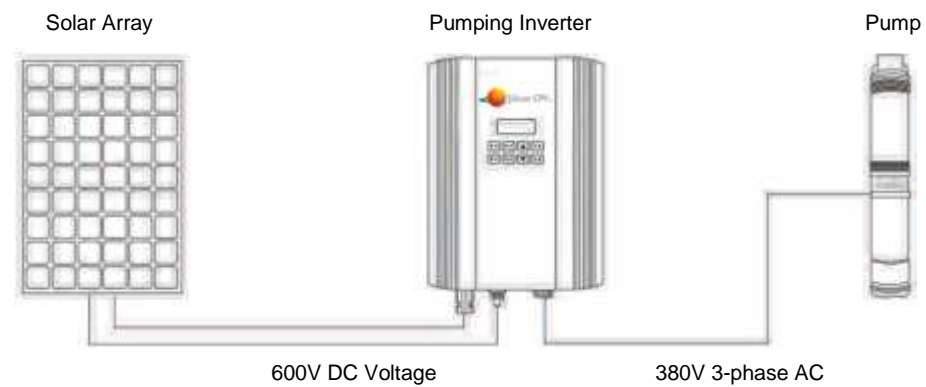
- Patented dynamic maximum water point tracking (MWPT) control method ensure stable operation
- Silicon CPV system Pumps up to 40% more water than other solar water pumping systems
- Highly intelligent power management module ensures high reliability and up to 98% conversion efficiency
- Anodized aluminum case for Power module and solar tracking structure
- Long life stainless steel Pumps
- High efficiency 3-phase induction motors
- Automatic switch between speed governing and rated speed modes
- Water-level detection and control circuit options available
- The system requires no external battery
- CE Certified

## Silicon CPV's SOLAR WATER PUMPING

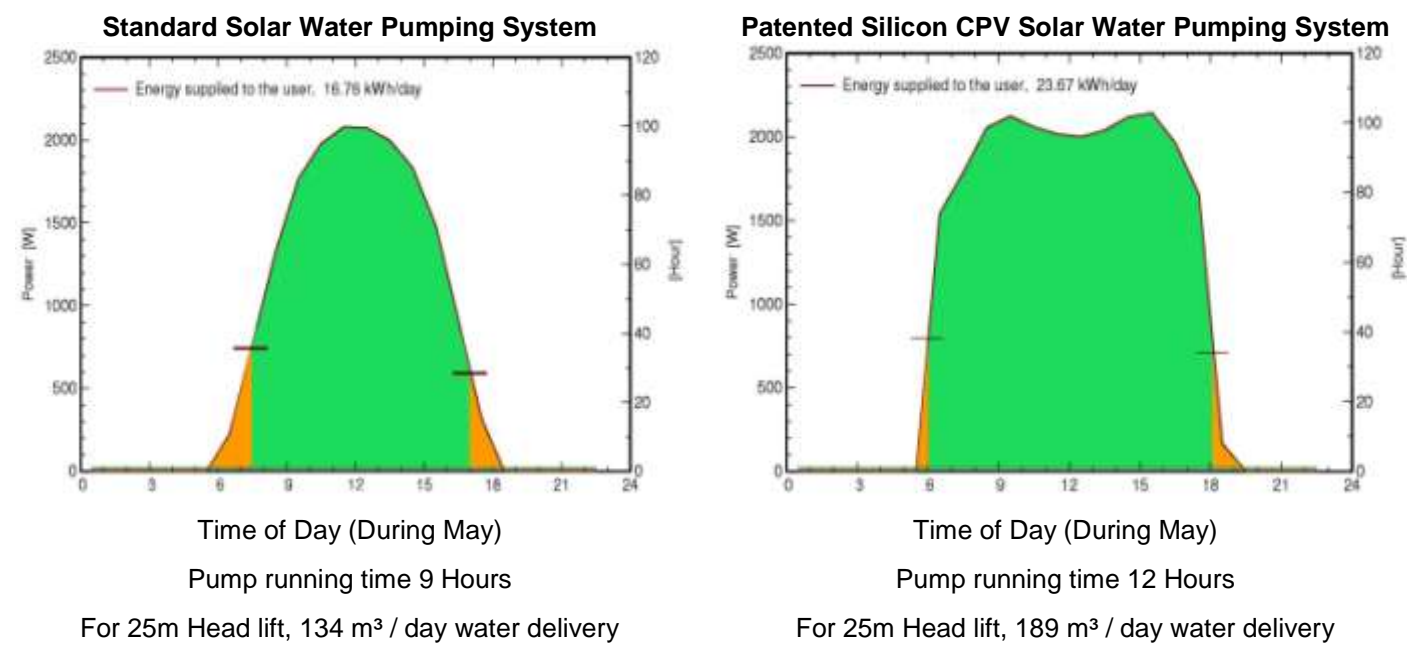
Solar water pumping systems produced by Silicon CPV are long life and highly efficient for lifting water in the range from 10m to 200m with a daily water capacity in the range from 5m<sup>3</sup> to 900m<sup>3</sup>. They are ideal for providing water for drinking, agricultural irrigation, forestry irrigation, desert control, animal husbandry, water supply for islands and many more applications. Silicon CPV's solar pumping system do not require any battery systems but can be used for direct water supply or for pumping water into storage facility. The systems are optimized for maximum water production at the lowest cost. Silicon CPV's proprietary tracked solar arrays provide the highest pumping hours per day. High efficiency intelligent controllers deliver 98% of collected solar energy to long life high voltage high efficiency 3 phase AC motors. The motors drive submersible stainless steel pumps to lift water up to 200m. High Voltage, 3 phase AC motors improve the reliability of the pumping system and at the same time dramatically lowers the maintenance costs of the system.

By utilizing free energy from the Sun, these systems offer total independence from the fossil fuels and can be installed far away from the electricity grid making more of the barren land into productive land. This will give the farmers freedom from ever increasing cost of grid electricity or diesel and help improve the environment

A typical solar water pumping system consists of a pump, a power-matched solar array and an inverter. Silicon CPV's patented solar water pumping systems aim of to produce the maximum amount of water with minimum amount of PV modules and for the longest pumping hours per day.



The rotational speed of pump is regulated according to the level of solar irradiation; when the sunlight reaches its peak, the pump runs at the rated speed, and the output approaches the peak power of the solar array; when the sunlight is less abundant, the speed of pump goes below the rated speed until there is insufficient power to turn the motor.



The above results are based on data collected at our factory located in Hattar on 14<sup>th</sup> May 2012 which was a good sunny day.



Silicon CPV's solar pumping inverters convert DC from the proprietary solar array into 3 phase AC voltage to drive the pump. With the function of maximum power point tracking (MPPT) and maximum water point tracking (MWPT). They regulate the output frequency according to irradiation level in real time to achieve the maximum output.

- High efficiency inverters drive pumps equipped with 3-phase AC induction motors
- Utilizes the dynamic maximum power point tracking (MPPT) control method and maximum water pumping tracking.
- Fully automatic operation. It can freely set speed range of pump based on the actual solar irradiation level.
- Operation data can be logged for up to 8 years
- Intelligent power module with conversion efficiency up to 98%
- Full electrical protection with water-level detection and control circuit to prevent overflow and dry extraction
- Anodized aluminum case. Enclosure class:IP41. Ambient temperature, -10-+50.C.



The pump driven by a 3-phase AC induction motor, draws water from wells or rivers, then pours water into the reservoir or storage tank or directly to irrigation systems. In Solar pumping systems, pump selection is very important, this will directly affects the economy and stability of the whole system. Correctly selected pump type can increase working time and water flow rate of the solar pumping system. For example, low head and high water flow will require a different pump configuration compared to high head and low water flow.

**Precautions :** Do not run the pump dry - Solids in the water should not exceed 0.02% (weight ratio) – ph level of water must be in 6.5 -8.5 range

**Silicon CPV's Solar Water Pumping Selection Table**

Model No.	Solar Power	Inverter Power	Pump Power	Head Lift (m)	Flow Rate (m <sup>3</sup> /Day)
SCPV-W1500	1,500W	1,500W	1,100W	10 to 50	180 to 30
SCPV-W2400	2,400W	2,200W	1,500W	10 to 60	280 to 45
SCPV-W4800	4,800W	3,700W	3,000W	10 to 80	580 to 75
SCPV-W9600	9,600W	7,500W	5,500W	20 to 110	600 to 100
SCPV-W14400	14,400W	11,000W	9,200W	20 to 130	870 to 130
SCPV-W19200	19,200W	15,000W	13,000W	30 to 160	780 to 140
SCPV-W24000	24,000W	18,500W	18,500W	40 to 180	720 to 160
SCPV-W28800	28,800W	18,500W	18,500W	50 to 200	700 to 180