

# Solar Pump™

Sensible, Ecological, Economical, Reliable  
**The BEST Little Pump in the World !!**

## System Description

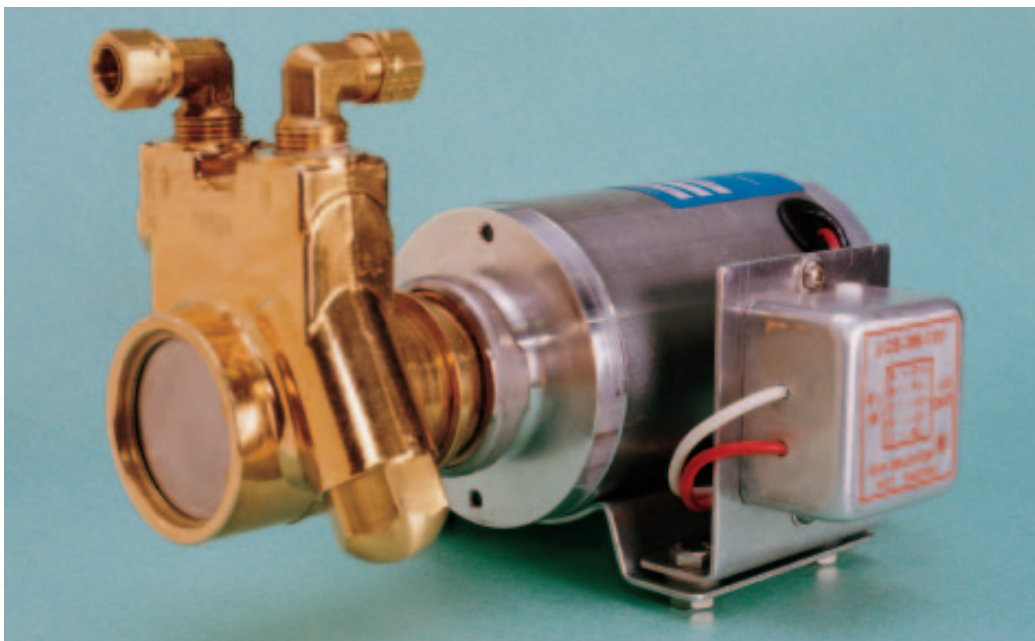
The sun powers the Solar Pump™. No batteries, no gasoline or diesel generator are required- only low-voltage, solar-generated electricity, eternally available and pollution free. The Solar Pump™ system utilises a positive-displacement vane pump driven by a DC motor. A photovoltaic (PV) module drives the DC motor using a current booster that provides high performance at all levels of solar irradiance.

## System Applications

The Solar Pump™ is the perfect pump for a solar water heater. There are no electronic controller and temperature sensors to install, with none of the associated high-voltage wiring. For single-family home solar water heaters a 10 - 20 watt PV module is usually adequate. The PV module powers the Solar Pump™ that circulates the solar collector fluid at the optimal flow rate to maximise the delivery of heat from the solar collectors. Installers love the Solar Pump™ - it is so much easier to install than the conventional controller-based systems. Homeowners appreciate the fact that **ALL** the energy used to produce their solar-heated water comes from the sun, and none from the electrical grid. The Solar Pump™ is also suitable for low-flow irrigation and general water pumping.

## System Advantages

The Solar Pump™ will run 2000 hours per year in mid-latitude countries. Assuming your application requires a 35-watt PV module you can save 200 kilowatt-hours of purchased electricity each year if using the Solar Pump™, or 2000 kilowatt-hours over the 10-year warranty period of the pump. These savings will more than cover the additional costs of the Solar Pump™ relative to a standard "plug-in" pump. Not only is it economical to use the Solar Pump™, but by using solar energy you reduce pollution. In fact, the Solar Pump™ will eliminate up to two tonnes of CO2 emissions per year!!



### Consider all the advantages:

- quiet, maintenance-free operation
- self-priming, positive displacement
- life expectancy of more than 20 years
- 10-year warranty
- easy and inexpensive to install
- provides for a healthier environment
- less exposure to electromagnetic fields (EMF)

### System Configuration:

- sliding-vane brass pump with integral strainer
- DC motor complete with mounting feet
- pump-motor V-band coupling
- 3-ampere linear current booster
- PV module, sized for your application

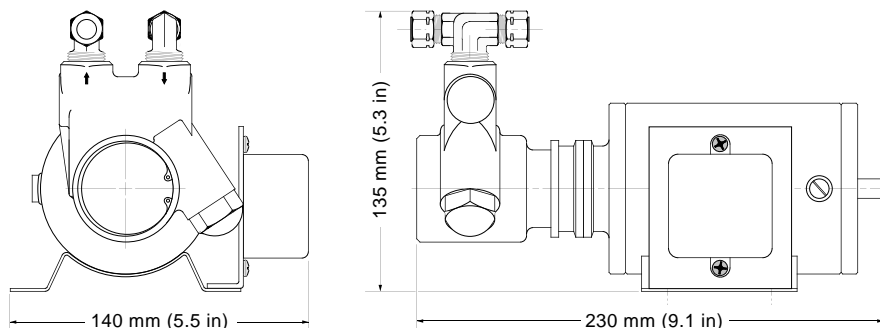
### Pump

The pump is a brass body, vane pump, with special clearances and seals for high temperature protection to 90°C. Maximum pressure rise is 400 kPa, (60 psi). At the inlet and outlet ports the pump has standard compression fittings for 3/8" OD tube (9.53 mm OD); 1/2" OD (12.7 mm OD) with models P34100 and P45125.

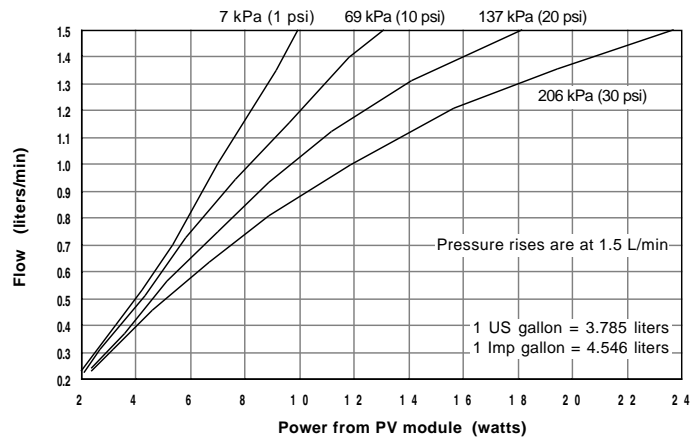
With the Solar Pump™ flow rates range from 0.3 L/min (0.1 USGPM) with model P15035 at zero pressure rise and low solar irradiance to 4.5 L/min (1.2 USGPM) with model P45125 at 400 kPa (60 psi) pressure rise and full sun. The Solar Pump™ operates in low sunlight - even at one-fifth of a full sun (200 W/m<sup>2</sup>).

The Solar Pump™ is engineered for long life and super efficient operation to enable you to use the lowest possible power PV module. The Solar Pump™ is equipped with a built-in strainer (100 mesh/125 micron). No parts are subject to corrosion - all wetted parts are stainless steel, brass and carbon. Each Solar Pump™ is backed by a 10-year warranty.

The Solar Pump™ is a positive displacement pump, which means no time or equipment is required to purge air from the circulation loop. It is also self-priming, with a maximum suction lift of 2 meters (6 feet).



Performance Curves for Model P15035



### DC Motor

The Solar Pump™ motor, because of its efficient design, is larger than motors designed to operate at 110 to 240 volts AC. Unlike standard motors that use electrical coils and electric current to create the magnetic field, which wastes precious electricity, we use efficient permanent magnets. To produce the torque required to boost the pressure of the pumped liquid we use a heavy-duty, large-diameter armature with thick copper windings to reduce parasitic power consumption. The result is amazing - even in very weak sun the motor produces enough power to start the pump, power that is produced in the "greenest" of all possible methods.

With durability and reliability in mind, the motor brushes and commutator are designed such that they will never require replacement when the motor is driven by a PV module under 50 watts peak power.

### PV Module

Depending on the flow and pressure requirements of your application a 10 to 50 watt PV module powers the Solar Pump™. A PV module with V<sub>mp</sub> of 16-17 volts is required, which is typical of PV modules with 36 crystalline cells or 13 amorphous cells. Tell us your flow and pressure requirements and we will specify the correct pump model and PV module.

### Linear Current Booster

The linear current booster (LCB) maximises the power delivery of the PV module to the DC motor. At full sun the PV module drives the motor at full speed. At lower sunlight levels the LCB converts PV power into high motor current to start the motor and keep it running at low RPM. This control strategy provides a flow rate proportional to the intensity of the solar radiation. The LCB is rated for up to 3 amperes of current from the PV module.

Maximum Flow Rates

Model #	Liters/min	USGPH
P15035	1.5	24
P19050	1.9	30
P24070	2.4	38
P34100	3.4	54
P45125	4.5	71

Weight = 3.9 kg (8.5 lbs)