

# Solar DC Circulation Pump

## ACS -TS5 Data Sheet

### Areas of use

- Hot Water Circulation
- Radiant Floor Heating
- Solar Applications
- Liquid Transfer
- General Purpose Pumping

### PV operated easily

For solar system loops, the pump can be powered directly from a PV panel. The sun comes up, heat builds in the solar hot water panel and at the same time electricity is made in the PV panel. The pump slowly starts with the smallest amount of current and pushes the heated water to the storage tank. It's that simple and eliminates all controllers, thermostats and sensors.

### Main Features

- Voltage: 6V~24V DC (Rated:12V DC)
- Max working temperature: 110°C (230° F)
- Max working pressure: 10Bar
- Noise Level: 45dB at 1m distance
- Long life brushless motor with energy efficiency technology
- Soft start at very low in-rush current
- Directly powered from PV panel
- Min start-up power consumption less than 2 Watt
- Advanced magnetic drive technology static-impeller, no seal leakage
- Durable permanent magnetic rotor/impeller with ceramic shaft
- Heavy duty design for 24Hr continuous duty
- Low power consumption, low or no maintenance

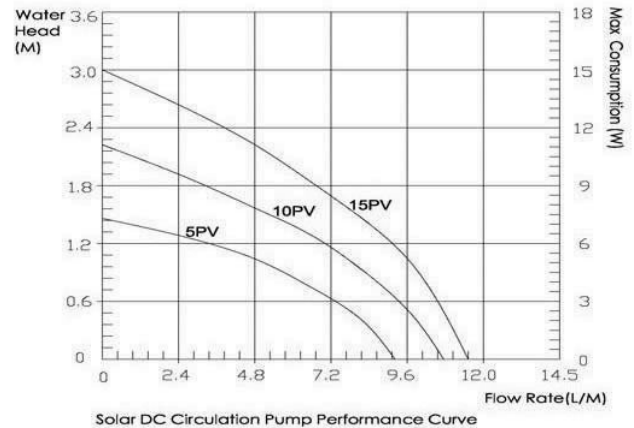
### Motor protection functions:

- a. Protection against dry operation.  
Drive circuitry can detect no or little liquid in pump chamber and will stop the pump
- b. Excessive temperature.  
The pump will slow or stop when the motor temperature increases beyond rated temperature as a result of elevated fluid temperature and installed environment temperature, and will automatically recover when temperature decrease to rated temperature
- c. Over load protection.  
The drive circuitry is protected against excessive current and load.

### Materials of Construction (Wetted Parts)

- Hi-Temp Ryton Plastic- PPS (food grade)
- Brass Inlet/Outlet
- Viton "O" Ring
- Hi-Temp Ryton (PPS) Impeller
- Ceramic Ferrite Magnet

### The performance

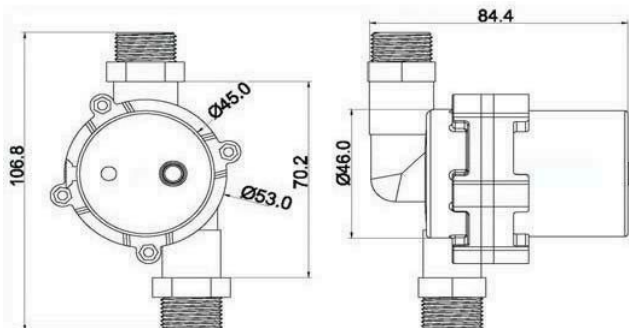


Max. flow based on discharge pressure of 0 psi and max. head based on operating pump at shut-off.  
Performance data is based on pumping clear water at normal ambient temperature.

MODEL	PV MODULE (W)	MAX HEAD (M)	MAX FLOW (L/M)
5PV	5	1.4	8.5
10PV	10	2.3	10
15PV	15	3	11.5

For direct PV operation, real PV output is affected by efficiency of PV and intensity of sunlight, the full load flow of pump is subject to the correct power supply.

### Dimensions



**Note:** ACS Solar Systems only recommend using good quality Crystalline PV ( Photovoltaic ) Panels for direct Connection to ACS-TS5-PV Pumps.

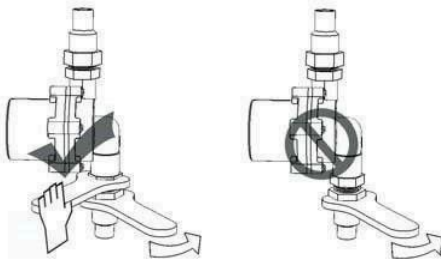
# Solar DC Circulation Pump

## Installation & Operating Instructions

### CAUTION!

- Check that the pump body and parts have not been accidentally damaged or that any bolts or nuts have not been loosened in transit.
- To avoid breaking the inlet&outlet, when connecting to pipework connections, it's necessary to reliably fix the hexagonal nut of inlet/outlet by wrench. (as shown in the following figure)
- Wires have polarity. Red is plus and black is minus. Wrong polarity will damage the motor.
- Make certain that the system is filled with liquid and that all air has been purged before starting the pump.
- Be sure the power source conforms to the requirements of pump.
- There is a powerful magnet inside the pump liquid end, do not use any liquid that contains metallic substances such as iron, nickel, etc.
- To avoid the introduction of water into the electronics, keep the pump body dry.
- Pump should be drained when subjected to freezing temperatures or system must be anti freeze protected .

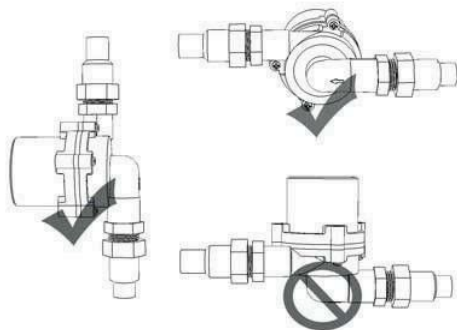
### Connecting:



### Installation & direction

- It is preferred that the pump always remains in a horizontal position and pumping upward. (as shown in the following figure)
- It is acceptable for the pump to be mounted under the piping in a Vertical direction.
- The pump cannot be mounted above the piping in a vertical direction and any position of the motor above the pump chamber, will cause the pump to run dry leading to premature failure of the pump.
- It is recommended that the pump shall be installed in a position lower than the liquid level of the tank by at least 12 inches (30 cm). If this distance is too short, air may enter the pump, causing damage.
- To minimize frictional resistance, the shortest piping possible with a minimum number of bends should be utilized on the inlet or suction side of pump.
- Install a water conditioner if you have hard water.

### Installing:



### Before starting the pump:

- Install the pump in correct direction and position.
- Make certain that the power source conforms to the requirement of the pump.
- Be sure the check valve is installed in the proper direction of flow.
- Make certain that the system is filled with liquid and that the air has been purged.

### Starting the pump

- Open the isolation valves and any other valves that may have been closed during the pump installation
  - Switch power on to the pump
  - Power cycling the pump several times accelerates the air removal. If you hear noise initially, this should abate after a short while as air is purged from around the impeller
- If the pump is noisy there may be air trapped in the system. To purge the air from the pump, turn the pump off and on several times
- To purge the air from the system open system valve until all the air in the System has escaped.
- If the noise does not disappear or decrease substantially, change the pump's installation direction or position, and purge the system once again.

### Trouble Shooting

#### Noise in the System

- The pump should run smoothly and quietly, the virtual noise intensity is relative to the pump consumption. During normal operation, an occasional air bubble may pass through the pump housing causing a momentary gurgling noise. However, if noise at the pump persists for any prolonged period, correct the problem (see below).
- Check valve/non-return valve is mistakenly installed on the inlet side of pump or in the wrong direction.
  - The inlet side shut-off valve is closed or clogged.
  - There is air trapped in the pump housing, turn the pump on and off several times to see if the air pocket can be "pumped" out of the pump and if not, then open a valve for manual venting until all the air in the line has escaped.
  - Loose pipe connections permit air into the system loop.
  - The pump was mounted above the piping in a vertical direction, the rotor maybe be surrounded by air and no liquid for lubrication, dry running virtually (change installation direction and purge of air)
  - There is sediment blocking the rotor/impeller.
  - The rotor bearing has worn due to dry running causing the rotor to Vibrate and move during operation.

#### Pump Operating Intermittently or Not at All

- Error in polarity connecting (will damage the motor).
- No or insufficient power to the pump.
- Dry running protection operated, switch off the pump and on again.
- Over-temperature protection is working, will resume normal running when the temperature decreases.
- The ceramic bearing of rotor is worn or damaged, replace Rotor/impeller.
- There is sediment in the recirculation line that can restrict the flow, please clean the impeller.

*If above reasons doe's not resolve the problem, please unplug the pump several times.*