ROCKSOLAR 1.61HP Solar AC/ DC Swimming Pool Pump Kit

For Pools up to 45,000 Gallons

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1. Introduction

Thank you for choosing the ROCKSOLAR 1.61HP Solar AC/DC Swimming Pool Pump Kit. This system is designed to provide efficient, eco-friendly water circulation using both solar energy (DC) and grid power (AC) backup.

This manual will guide you through installation, operation, maintenance, and troubleshooting.

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2. Safety Instructions

- Read this manual carefully before installation and operation.
- Disconnect all power sources before servicing.
- Do not operate the pump without water (dry running).
- Residual Current Device (RCD / GFCI) must be added
- Ensure proper grounding for AC/DC connections.
- Keep children away from electrical components.
- Install in a well-ventilated, dry area.

Solar Panel Safety Warnings

- Solar panels generate electricity when exposed to light. Always treat them as live.
- Do not touch exposed wiring or connectors under sunlight.
- Cover panels or disconnect them before installation or maintenance.
- Ensure correct polarity when connecting DC inputs.
- Do not exceed controller voltage limits (80–180V DC).
- Use proper MC4 connectors and secure all connections.
- Avoid installing panels in shaded or partially shaded conditions.
- Mount panels securely to withstand wind and environmental loads.
- Do not walk on or apply pressure to solar panels.
- Only qualified personnel should perform electrical installations.

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3. System Overview

Key Features

- 1.61HP high-efficiency motor
- Dual power input: Solar DC + AC backup
- Intelligent controller with automatic switching
- Suitable for pools up to 45,000 gallons
- Corrosion-resistant design

Package Contents

- Pool pump unit
- Solar pump controller
- Solar panel (Included in Swimming Pool pump kit only)
- PV cable(Included in Swimming Pool Pump Kit only)
- Solar Combiner box(Included in Swimming Pool Pump kit only)
- User manual

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4. Technical Specifications

4.1 Pump Specifications

Parameter	Specification
Rated Power	1.61HP
Voltage (DC)	80–180V DC
Voltage (AC)	150V–240V AC
Max Flow Rate	Up to 91.6 GPM
Recommended Pool Size	Up to 45,000 gallons
Protection Class	IP55

4.2 440W Solar Panel Specifications

Parameter	Specification
Rated Power (Pmax)	440W
Maximum Power Voltage (Vmp)	~32V
Maximum Power Current (Imp)	~13A
Open Circuit Voltage (Voc)	~39V
Short Circuit Current (Isc)	~14A

Parameter	Specification
Module Efficiency	~22%
Cell Type	Monocrystalline
Operating Temperature	-40°C to +85°C
Maximum System Voltage	1500V DC
Connector Type	MC4 Compatible

5. Installation

5.1 Location Requirements

- Install close to pool filtration system
- Ensure flat, stable surface
- Protect from direct flooding
- Allow adequate airflow

5.2 Plumbing Setup

1. Connect inlet to pool suction line.
2. Connect outlet to filter system.
3. Ensure all joints are sealed.
4. Install a check valve if required.

5.3 Electrical Connections

Solar (DC) Connection

- Connect solar panels using MC4 connectors.
- Ensure voltage is within 80-180V DC range.
- Observe correct polarity.

AC Connection

- Connect to 150–240V AC power source.
- Ensure proper grounding.

5.4 Controller Setup

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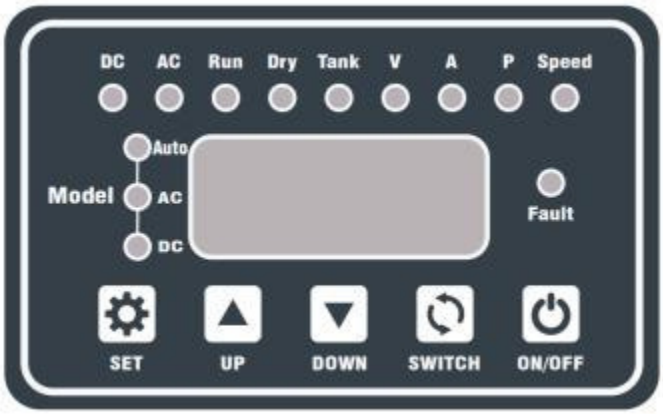
- Connect pump cables to controller terminals.
- Connect DC and AC inputs accordingly.

Controller

LED Lamp Instructions In Panel

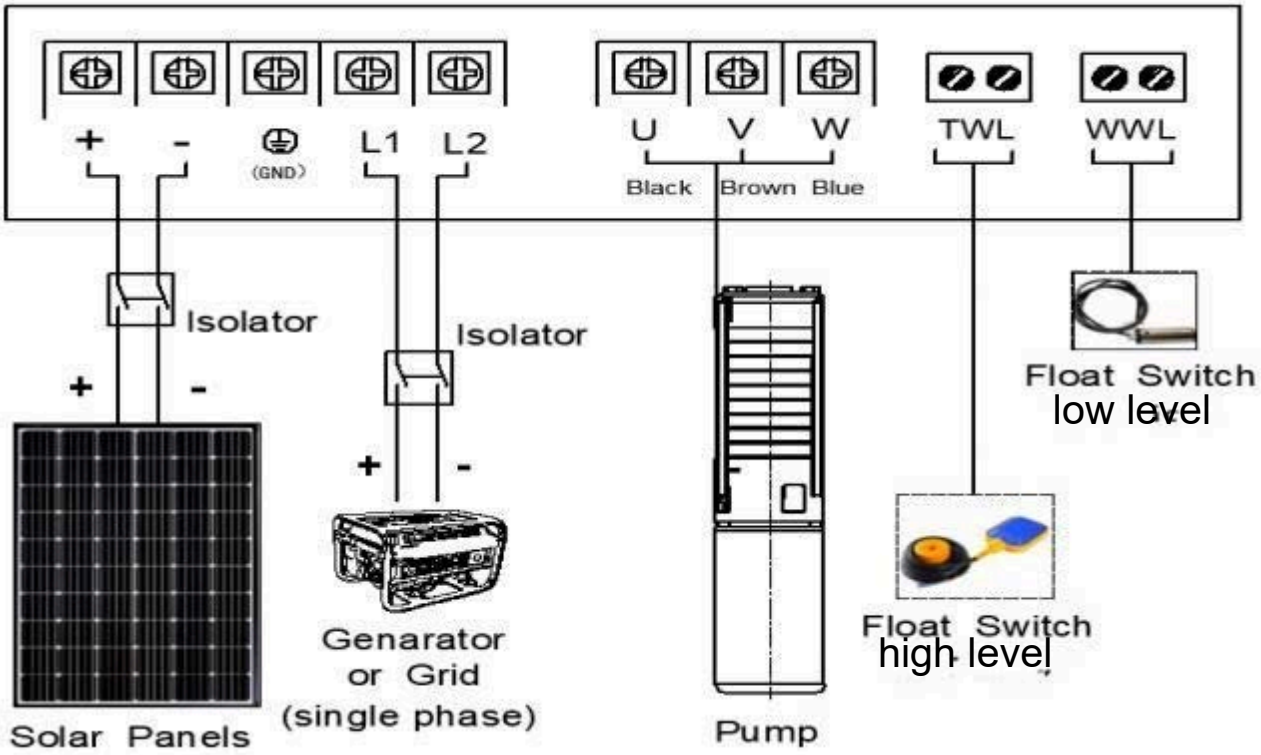
◆ LED【 **DC**】: DC power supply, the indicator is on; :
◆ LED【 **AC**】AC power supply, the indicator is on;
◆ LED【 **Run**】 : Controller is turned on, the indicator lights up,Associated with 【**ON/OFF**】
◆ LED【 **Dry**】 : Alarm for pump dry protection, Associated with **WWL** terminals Or **low power** ;



◆ LED【 **Tank**】 : Alarm for Water tank full protection , Associated with **TWL** terminals;
◆ LED【 **V**】 : When this indicator light is on, Voltage is displayed;
◆ LED【 **A**】 : When this indicator light is on, Current is displayed;
◆ LED【 **P**】 : When this indicator light is on, Power value is displayed;
◆LED【 **Speed**】 :Whenthisindicatorlight is on, Speed is displayed;

◆ LED【 **Fault**】 :AlarmforVariousfault;
◆ LED【 **Model- - Auto**】 :**AUTOMODE:**IntelligentselectionofDCorACpower,DCfirst.
In **AUTO Model**, AC power is being used, and Led 【**Model--AC**】 flashes once every 3S;
In **AUTO Model**, DC power is being used, and Led【**Model--DC**】 flashes once every 3S;
◆ LED 【**Model--AC**】:**ACMODE**:powersuppliedfromaGeneratororMainspower;
◆ LED【**Model--DC**】:**DCMODE:**powersuppliedfromaSolarArrayorBatterystorage;
◆Press 【**SET** 】, Select power supply mode,**AUTO**、**AC or DC MODE**.
◆Press 【**SWITCH** 】, check the 【**V**】, 【**A**】, 【**P**】, 【**Speed**】cycle.

Electrical Connections



Parameter Setting

Step 1: Enter the setting interface.

- Press and hold【 **SET**】and 【**SWITCH**】at the sametime for 3 seconds. After 5 seconds countdown, H00 will be displayed

Step2: Enterparameterchangepassword（Defaultpassword H00-12 ）

Note:pleaseentercorrectpasswordbeforeanyparameterchangeprocess,or change will useless .

- Press 【 **SET**】 to enter H00, and adjust H00 value to 12 through 【**UP**】 and 【**DOWN**】
- Press and hold 【 **SET**】 for 3 seconds to save the parameters and return to H00

Note： Shortpress 【 SET】 toreturntoH00directly,buttheparameterisnotsaved and does not work.

Step 3: Set various parameters, such as speed, power, etc

Note:VariousparametercodesH00~H09,refertotable1.

- After set H00 value to 12 and save it. Adjust parameter H01-H09 through up and down.
- Press 【 **SET**】toenterHxx,andadjustHxxvaluethrough【**UP**】and【**DOWN**】
- Pressandhold 【 **SET**】 for3secondstosavetheparametersandreturntoHxx

Note： Shortpress【SET 】 to return to Hxx directly, but the parameter is not saved and does not work.

Step4: Exittheparametersettinginterface

- Short Press the 【**SWITCH**】 Exit the setting interface

Note： No operation in the setting interface for 2min, it will exit automatically

Step5: Restorefactoryparameters（Default H00-10 ）

- Set H00 to 10 and save,For specific operation, refer to **step 2**.

Parameter Code And Default Value

Table 1

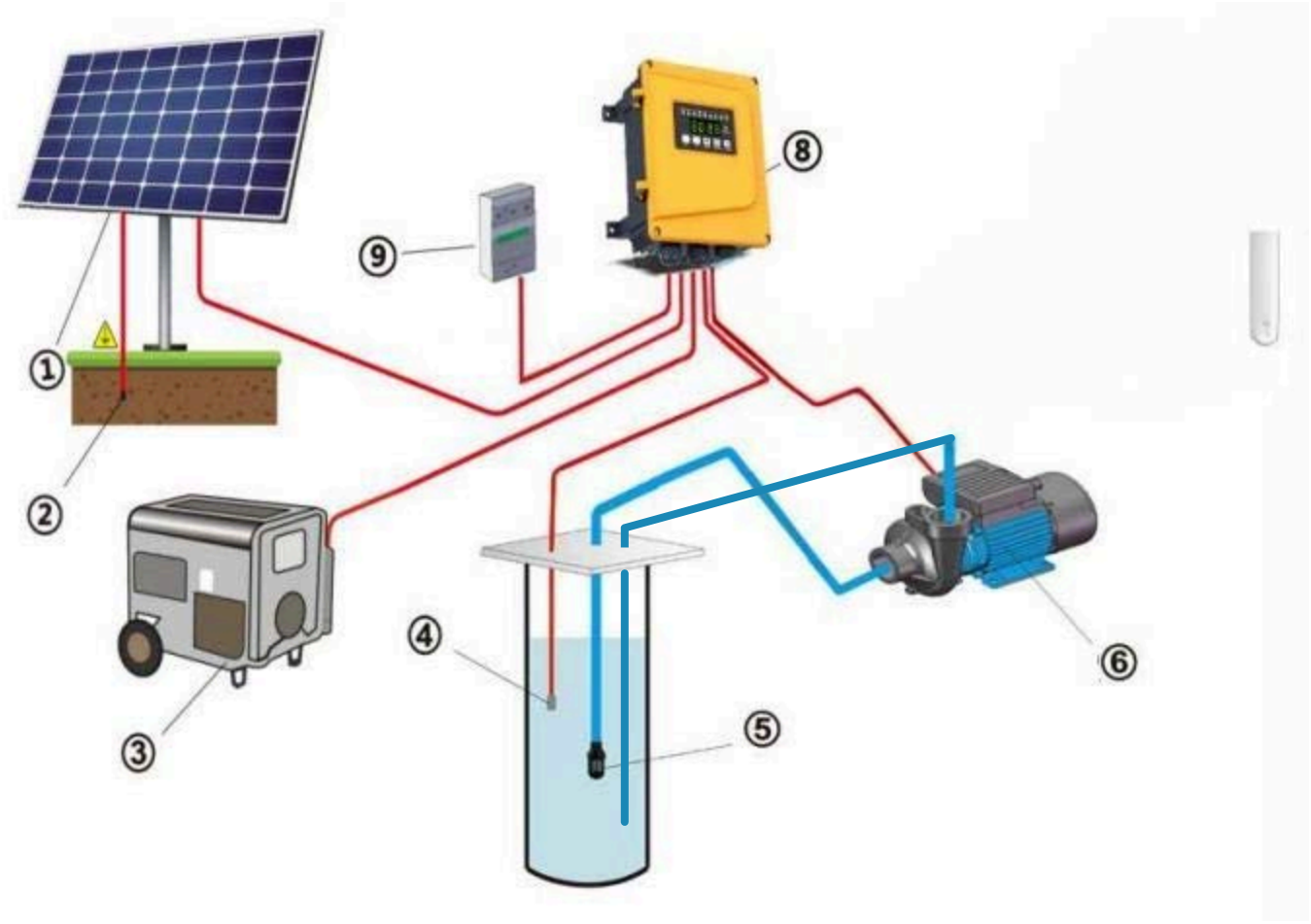
Code	Interpretation	Adjustable range		Default value
H00	10： Restore the factory settings or 12:Change the parameter password	0-12		0
H01	High voltage protection value	450		450V
H02	Low voltage protection value	50		50V
H03	Maximum speed	2500-4200RPM		4000RPM
H04	Tank full recovery time(TWL)	30-1800S		600S
H05	Recovery time of dry protection(WWL)	30-1800S		600S
H06	Recovery time of dry protection(Low power)	300-1800S		1 8 00S
H07	Maximum DC input power	0.5HP	300-750	750W
		0.75HP	300-1000	1 0 00W
		1HP	500-1200	1 2 00W
		1.5HP	500-1800	1 8 00W
		2HP	500-2200	2200W
		3HP	500-3000	3000W

Alarm and Fault code

Table 2

Code	I nterpretation	Causes and Solutions
P50	Low voltage protection	◆The Voltage below the requirement
P51	High voltage protection	◆The voltage exceeds the requirement
P48	Dry protection	◆Water shortage in well, low power ◆**WWL** “closed ”.
P45	Tank Full	◆Water tank full ,**TWL** “Open”.
P02	PFC protection	◆PCB fault, need to return to factory for inspection
P09	U phase over current	◆**Controller U phase output over current or cable too longer**
P10	V phase over current	◆**Controller U phase output over current or cable too longer**
P11	W phase over current	◆**Controller U phase output over current or cable too longer**
P43	Phase Missing Protection	◆Phase loss of controller output; ◆The wiring between the motor and the controller is loose. ◆The cable is damaged and needs to be replaced. ◆ The motor may be damaged. Please check the motor resistance between every 2 items of UVW,exceed 15% is not allowed
P44	Short circuit protection	◆ Short circuit of cable or terminal between motor and controller; ◆ the motor or cable is damaged; ◆The pump is blocked or jammed; remove the jam
P46	Stall Protection	◆ check whether the connection between the pump body and the motor is smooth； motor bearing damage, need to replace the bearing ◆Low Power
P60	Controller High Temperature	◆ Keep good ventilation and heat dissipation near the controller
P20	Abnormal fan	◆ The fan is damaged or jammed; remove the jam or replace the fan
E10	PCB component failure	◆PCB damaged, need to return to factory for inspection
E00	Power mode error	◆ Power mode error,please chose **Atuo** mode ◆ AC/DC wrongly connected.The **L1 / L2** terminals of the controller correspond to AC power, **+/-** correspond to DC power

System Installation Diagram



- 1、Solar Panel Array
- 2、Grounding pile（Optional）
- 3、Generator or Grid (Single phase 220V)
- 4、The Low-Level Float (optional)
- 5、Check valve
- 6、BLDC Surface Pump
- 7、The High-Level Float （Optional)
- 8、External controller
- 9、SPD(DC-600V), Surge Protection Device (Optional)
- SPD(AC-275V), Surge Protection Device (Optional)

Solarpumpoperationisverysimple,pleasereadthemanual carefully before use.

System Installation

Tips for ROCKSOLAR swimming pool pump

◆ Dry operation is strictly prohibited for surface pump.

◆For non the self-priming pump, the suction port must be installed with check valve. Before use, the pump body and suction pipe shall be filled with water.

◆For the self-priming pump, Before use, the pump body shall be filled with water.

◆When the pump is stored for a long time, please rotate the rotor shaft before use to prevent the machine from jamming or damaging the mechanical seal

◆The suction pipe shall not leak air, otherwise water may not come out.

Water Source

The water source must be “clean water”, free from contaminates such as, dirt, dust, loose rocks, decaying organic matter and other foreign bodies that could block the intake screen or fowl the impeller stack. It is recommended to install a check valve with a filter screen cover at the suction

Pump Installed

◆ The pump is IP54 Rated . it is recommended that the pump is not mounted in direct sunlight or rain.

◆ Make sure that the suction pipe of the pump is completely submerged in water;

◆The maximum suction head of the pump shall not exceed 8m. During installation, the pump shall not be higher than 8m above the water surface.

◆ Allowable operating temperature 0-40℃.

◆ When the ambient temperature is lower than the freezing temperature of water, it is necessary to protect the pipeline or discharge the water left in the pump and p ipeline.

Installation Of Controller

The Controller Panel is IP65 Rated however it is recommended that the panel is not mounted in direct sunlight. It is recommended to install on the back of solar panels or in a room or control cabinet with good heat dissipation.

Distance Between Controller And Pump

The farthest installation distance between controller and motor is 80m. The further installation distance may lead to control failure. In addition, the cable between the motor and the controller will cause power loss. For long distance installation, please thicken the cable specifications as required.

Installation Of The Float

The Low Level Float

◆ The low-level float fitted into the **WWL** terminal to prevent dry running.

◆ When the water level rises the pump will restart after a 10-minute delay,The display shows the countdown of delay time.

The High Level Float

◆ The High-Level float fitted into the **TWL** terminal to prevent the tank is full.

◆ To prevent the pump from starting and stopping frequently, adjust the float to a suitable swing range.

◆ When the float “closed”, the pump will restart after a 10-minute delay,The display shows the countdown of delay time.

SPD(Surge Protection Device)

The Surge Protection Devices protect the system from lightning. Where lightning damage is likely to occur, SPD must be effectively installed and the system must be effectively grounded.

Please select suitable SPD,AC and DC mode, and the voltage specification should not be lower than the maximum voltage of the system.

Suction Check Valve and water filling before use

Before using the Surface Pump, the pump end and suction pipe must be filled with water. In order to prevent the leakage of water from the suction pipe, it is recommended to install a check valve with net cover at the suction inlet.

Extension Cable Specifications

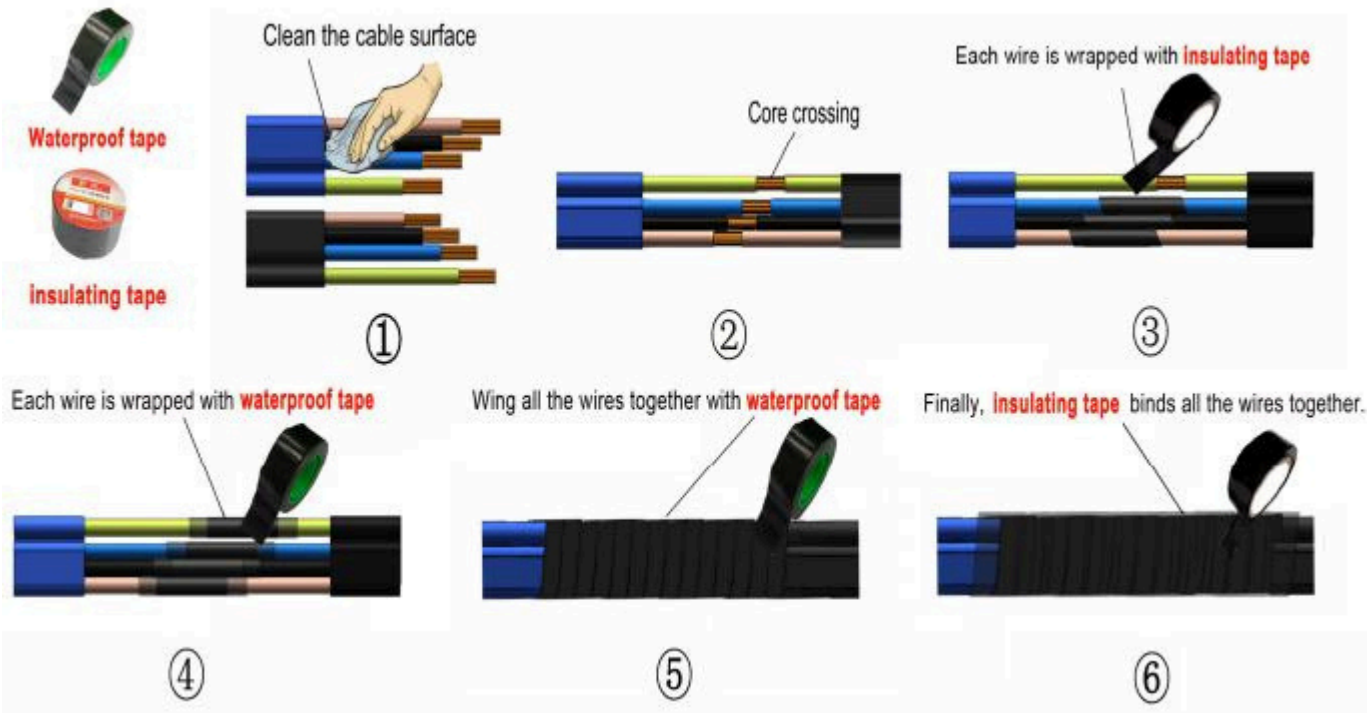
Locate the solar array and the controller as close to your water source as possible. it is important that energy losses are minimised to ensure performance expectations are met.

The distance between the pump and the controller shall not exceed 80m, and the cable shall not be less than 2.5mm2

Extension cable Jointing

The effective contact and waterproof of the joint of the cable extension line are the necessary conditions for the pump system to work for a long time. The wrong method may lead to electric leakage, and cause the pump system can not work or corrosion, and even cause personal injury.

The factory provides an effective wiring method and material, please follow the steps in the picture.



Solar Array Installation

Warning

• The power supply from a DC power source such as solar panels can cause **SERIOUS HARM** or **DEATH** from electrocution
• Use appropriate safety procedures when working on any system component
• Only suitable qualified personnel should carryout electrical connection /disconnection
• Off-grid electrical equipment is subject to applicable regional and national electrical standards
• Always treat solar panels as **LIVE** and handle with care
• Use correctly rated electrical cable and connectors

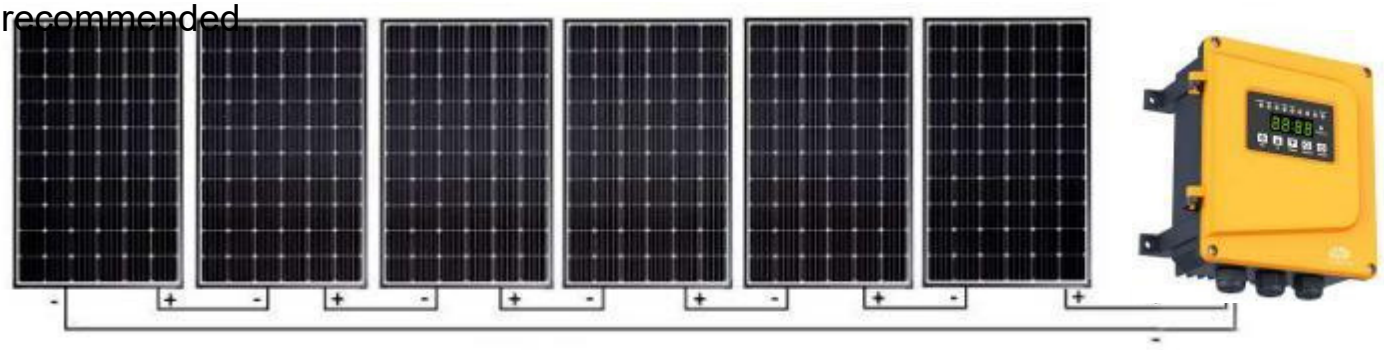
Solar Panel Glossary of Electrical Terms

Table 4

Term	Definition
V OC(V)	Volts open circuit,nothing connected
V mp(V)	Volts maximum power point,under load
I sc(A)	Amps short circuit
Imp or Impp(A)	Amps maximum power point

Solar Panel Connection(Recommended in series for the Pumps)

In order to make the system more safe and effective, the maximum DC input current of this series of pumps is limited to 10A. Therefore, Solar panel parallel system can not play the maximum efficiency. In General, solar panels in series are recommended.



In series solar panel system, VOC,Vmp and Power are calculated as follows:

- VOC of System = VOC of each solar panel × Number of solar panels;
- Vmp of System = Vmp of each solar panel× Number of solar panels ;
- Power of System = Power of each solar panel ×Number of solar panels
- Current of System = Current of each solar panel

Motor and Controller Input Energy Limitations:

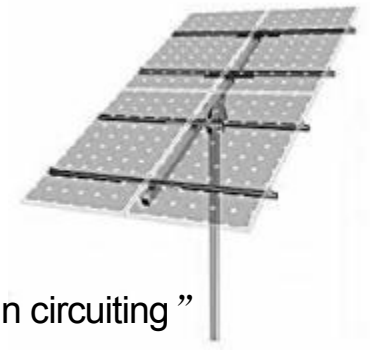
Table 5

Motor& Controller	AC		SOLAR / DC			Solar panels (340W)	
	Voltage	Max. Current	Vmp	Max. VOC	Max. Current	Accept	best
0.5HP	150-240	10A	60-380	450	10A	(2-10) Pcs	(2-3) Pcs
0.75HP	150-240	10A	60-380	450	10A	(2-10) Pcs	(3-4) Pcs
1HP	150-240	10A	60-380	450	10A	(2-10) Pcs	(3-5) Pcs
1.5HP	150-240	12A	60-380	450	10A	(2-10) Pcs	(4-6) Pcs
2HP	150-240	12A	60-380	450	10A	(2-10) Pcs	(5-7) Pcs
3HP	150-240	12A	60-380	450	10A	(2-10) Pcs	(7-10) Pcs

*The pump system must not exceed the allowable **VOC** voltage , otherwise, it will cause pump damage and even personal damage.Damage caused by incorrect voltage is not Warranty.*

Solar Array Installation Considerations:

- The installation direction of solar panels must be determined according to the installation position. Generally, in the southern hemisphere, the solar panels should face north. In the northern hemisphere, it should face south.
- The solar panel angle should correspond to the latitude of the site. Consult the instructions supplied with the solar array to assist your decision regarding the best angle for your situation.
- Any shading whatsoever will reduce the solar panel(s) performance so locate the
- panels with this in mind. Panel shadowing is like “open circuiting” a panel.
- Dust or bird droppings will impair the array energy output. Keep panels clean.
- Ensure the array is earthed to ground in the event of lightning strike.



6. Operation

Automatic Mode

- The system prioritizes solar power.
- Automatically switches to AC when solar is insufficient.

Manual Control (if applicable)

- Use controller interface to start/stop pump.

Start-Up Procedure

1. Fill pump with water (prime pump).
2. Turn on controller.
3. Verify water flow.

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7. Maintenance

- Clean pump basket weekly.
- Inspect wiring monthly.
- Check for leaks in plumbing.
- Keep solar panels clean.
- Ensure ventilation openings are clear.

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8. Troubleshooting

Issue	Possible Cause	Solution
Pump not starting	No power	Check AC/DC input
Low flow	Blockage	Clean filter/pipes
Noise	Air in system	Re-prime pump
Controller error	Voltage issue	Verify input range

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9. Storage & Winterization

- Drain all water from pump.
- Disconnect power sources.
- Store in dry, frost-free location.

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10. Warranty

ROCKSOLAR provides a limited warranty covering manufacturing defects. Warranty does not cover:

- Improper installation
- Unauthorized modifications
- Normal wear and tear

Contact ROCKSOLAR support for claims.

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11. Customer Support

ROCKSOLAR Support Team
Email: support@rocksolar.io
Website: www.rocksolar.io

End of Manual