



17L SOLAR POWER POOLS PUMPS

# USER MANUAL

Model: JLP17/15-D48/500

REV: A



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## Notes for Safe Operation

### ■ Before Installation

 WARNING

Do not install or operate the controller that is damaged or has missing parts. Otherwise, it may result in equipment damage or harm life.

### ■ Installation

 CAUTION

- ⊙ Install the controller on nonflammable material like metal. Otherwise it may cause a fire.
- ⊙ When the controller is mounted in a protective cabinet, the cabinet need to set vents to ensure ambient temperature is below 40°C, otherwise it may be damaged because of high temperature.
- ⊙ When install the controller, you should avoid direct sunlight, can be installed under the PV array.

 WARNING

- ⊙ Ensure only qualified personnel to operate. Otherwise it can cause an electrical shock or damage of the controller.
- ⊙ Make sure the controller is isolated from power supply by the circuit breaker. Otherwise it may cause a fire.
- ⊙ Do not touch the power input terminals of the controller and the pump's terminals. Otherwise it may cause an electrical shock.

### ■ Operation

 CAUTION

- ⊙ Do not open or remove the front cover when operation. Otherwise it may cause an electrical shock.
- ⊙ Before testing the pump must be installed; can not make the pump dry-run for a long time. In order to test the pump, the maximum dry-run time is not more than 15s
- ⊙ If the pump turning is reversed, it can change any two lines of the pump's three power lines.
- ⊙ When the water pump is due to the light shadow, it will restart the operation after 10s.
- ⊙ If a water level probe is installed in the well, when the water level is below the level of water shortage, the water pump will stop, and start up again after 20 minutes. If there is no water level probe, it will need to be short. If a water level probe is not used, the controller terminal must be open..

### ■ Maintenance and check

 WARNING

- ⊙ Only qualified or authorized professional personnel can maintain, replace and inspect the controller. Otherwise it may cause damage and injury.
- ⊙ Wait at least 10 minutes after the power failure, or make sure that no residual voltage before carry out maintenance and inspection, otherwise it may cause damage.

### ■ Others

 WARNING

- ⊙ If failing to follow these instructions, resulting in damage to the machine, can not enjoy the warranty service.

## 1、 How It Works

SKYKING Swimming Pool Pumps are high quality products designed for use in residential and commercial swimming pools and spas. In most pool applications all of the filtration needs can be met directly from solar panels meaning no electricity costs and significant benefits to the environment.

The SKYKING pump uses a DC Sensorless Brushless Motor for high efficiency and reliability, it is connected to a solar generator via a controller. The controller monitors the system, controls the pump speed and optimizes the amount of water pumped based on the power available.



**Figure 1. SKYKING solar Power pools pumping system**

SKYKING solar pumping system is designed which consists of:

- PV Array
- Solar Power Pump Controller
- PM Brushless DC Pool Pump
- Water Source Level Switches

## 2、 The JLP-17/15-D48/500 Description

### 2.1 Model Instruction

JL    P    17    15    -D48    /500  
 ○    ②    ○    ○    ○    ○

○	Made in JiLu	○	Pool Pumps
○	MAX Flow	○	MAX Head
○	Rate Voltage	○	Pump Power

### 2.2 Material of Parts

Parts of Pump	Description of Material
Motor	Permanent Magnet Brushless DC Motor (Without Hall)
Controller	32bit MCU / FOC / Sine Wave Current / MPPT
Controller Shell	Die-cast Aluminum(IP67)
Outlet	Plastic
Pump Body	Plastic
Motor Body	Die-cast Aluminium
Bear	NSK
Impeller	Plastic
Screw	316 Stainless Steel
Cable	3 Meters / Three-core copper cable /2.0mm <sup>3</sup>

### 2.3 Performance Chart

	Item	Parameter Values
1.	Rate Voltage	48VDC
2.	Rate Power	500W
3.	Max Flow	17m <sup>3</sup> /h
4.	Max Head	15m

Model	Flow (m <sup>3</sup> /h)	0	3.5	7.0	10.5	14	17.5
JLP-17/15-D48/500	Head (m)	17	15	12	7	5	2

2.4 Curve

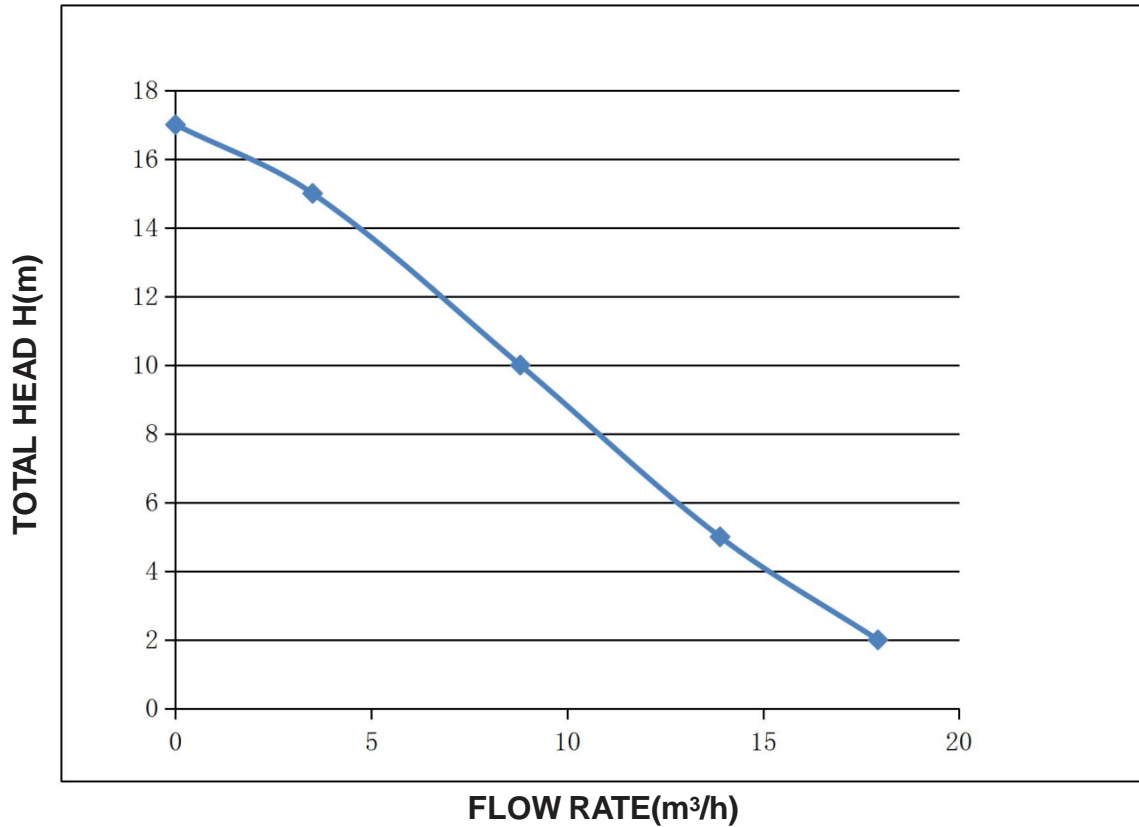


Figure2. Pump Curve

2.5 Pump Performance

Model	Power (W)	Voltage (VDC)	Max Flow (L/min)	Max Head (M)	Max Suct (M)	Outlet (mm)	Inlet (mm)
JLP17/15-D48/500	500	48	17	15	5	48	48

2.6 Pumps Outline Dimension



Figure3. outline Dimension

## **3、 The SK-197K1500-48 Controller General Information**

### **3.1 Features**

The SK-197K1500-48 solar pump controller is designed with the high standard of reliability expected of products. The controller attempts to drive the pump and motor to deliver water even under adverse conditions, reducing output as necessary to protect the system components from damage, and only shutting down in extreme cases. Full operation is restored automatically whenever abnormal conditions subside.

### **Inspection**

Before you begin, receive and inspect the SK-197K1500-48 solar pump controller unit. Verify that the part number is correct and that no damage has occurred during transit.

**NOTE:** SK-197K1500-48 solar pump controller is one component of a SK-197K1500-48 solar pumping system which has other two optional components, solar array and Brushless DC Motor pump.

### **Protection Features**

Electronic monitoring gives the controller the capability to monitor the system and automatically shut down in the event of:

- Dry well conditions – with low level switch
- Bound pump – with auto-reversing torque.
- High Voltage Surge
- Low Input Voltage
- Open motor circuit
- Short circuit
- Over heat

**NOTE:** This controller provides motor overload protection by preventing motor current from exceeding rating current and by limiting the duty cycle in the event of low water level. This controller does not provide over temperature sensing of the motor.

### **System Diagnostics**

The SK-197K1500-48 solar pump controller continuously monitors system performance and detects a variety of abnormal conditions. In many cases, the controller will compensate as needed to maintain continuous system operation; however, if there is high risk of equipment damage, the controller will protect the system.the fault condition. If possible, the controller will try to restart itself when the fault condition subsides.

### **Motor Soft-Start**

Normally, when there is a demand for water and power is available, the SK-197K1500-48 solar pump controller will be operating. Whenever the SK-197K1500-48 solar pump controller detects a need for water, the controller always “ramps up” the motor speed while gradually increasing motor voltage, resulting in a cooler motor and lower start-up current compared to conventional water systems. Due to the controller’s soft-start feature this will not harm the motor.

### Over Temperature Foldback

The SK-197K1500-48 solar pump controller is designed for full power operation from a solar array in ambient temperatures up to 45°C. In excess of 45°C temperature conditions, the controller will reduce output power in an attempt to avoid shutdown. Full pump output is restored when the controller temperature cools to a safe level.

### Level Control Switch

The SK-197K1500-48 solar pump controller can access two water level switch detects remotely control the pump automatically. Level switch for SK-197K1500-48 solar pump controller is optional, not mandatory




### 3.2 The Technical Parameters of The SK-197K1500-48 Solar Controller

















Item		Technical Parameters		
Voltage	Rate Voltage	48VDC		
	Max Open Voltage	100 VDC		
	Under Protection Voltage	36 VDC		
	Over Protection Voltage	80 VDC		
Current	Rate Current	12 A		
	Over Protection Current	15 A		
	Peak Protection Current	18 A		
MCU and Controller Mode		32bit MCU / FOC / Sine Wave Current / MPPT		
Shell		Die-cast Aluminum (IP67)		
Dimension		197mm*190mm*98mm		
Weight		2.1kg		
Cooling Mode		Natural Heat Dissipation		
Operating temperature		-20°C - +50°C		
Storage conditions		-20°C - +80°C/5~85%RH(No condensation)		
Operating mode		S1 (Continuous working)		
Adaptive Solar Panel	The Solar Panel of VMP	17~18V	29~30V	--
	The Solar Panel of VOC	21~22V	35~37V	--
*Nate: Please find the solar panel connection drawing at 4.1.1				



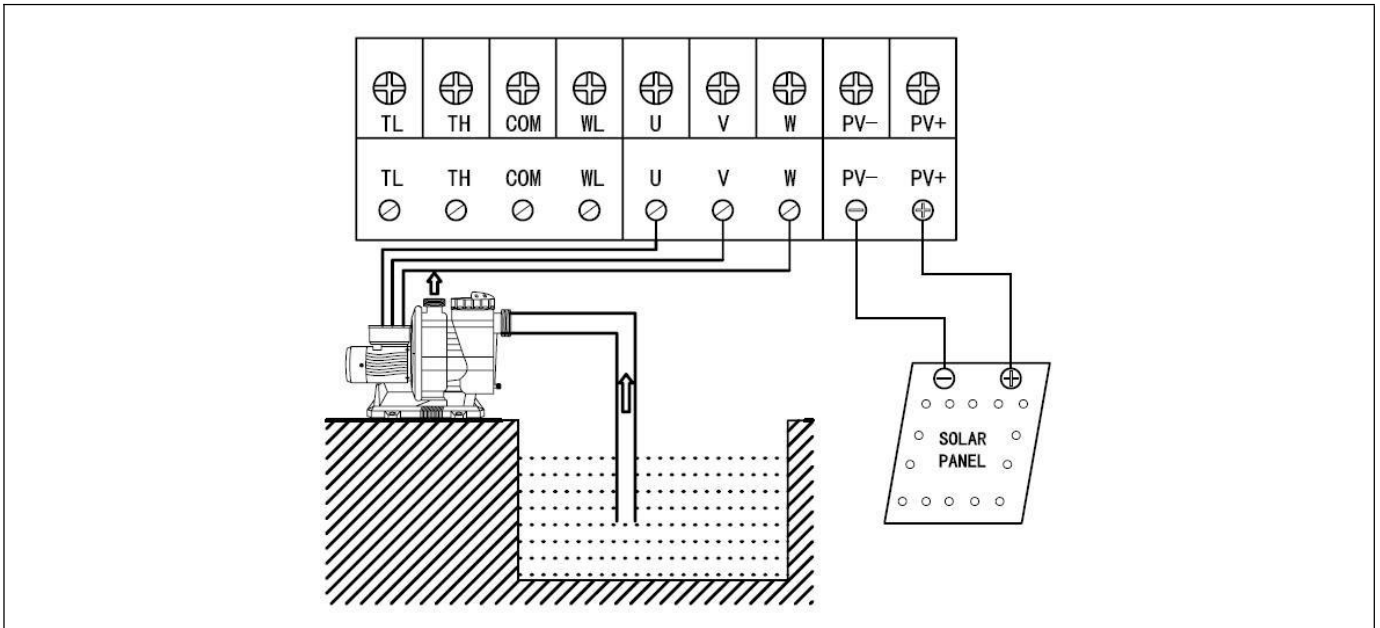
### 3.3 The operation mode of The SK-197K1500-48 Solar Controller



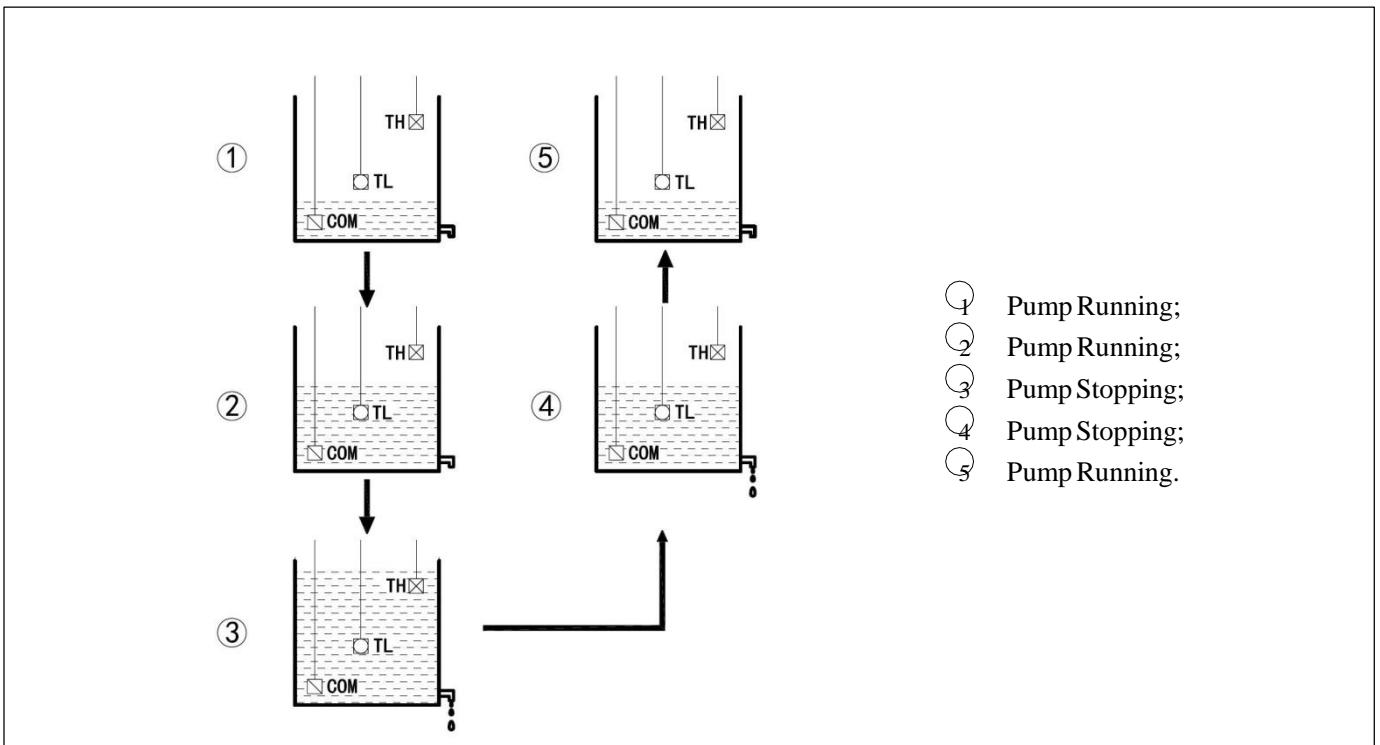
Push-Button Function Description	
	Push to Add the Speed
	Push to Reduce the speed
	Push to control Run and Stop

Indicator light function Description	
<p>5 </p> <p>4 </p> <p>3 </p> <p>2 </p> <p>1 </p>	<p>The Speed of the pump display</p> <p>Note: the controller control the pump run with 5 sets.</p> <p>The <b>1</b>  display, the run with the lowest speed.</p> <p>The <b>5</b>  display, the run with the highest speed.</p>
<p>    </p> <p>Power Running MPPT Well Tank</p>	<p>Power: Connect to Power display</p> <p>Running: Pump is Running display (*Nate1)</p> <p>MPPT: Controller running with MPPT Function display</p> <p>Well: Without water in the well display</p> <p>Tank: Pull water in the Tank display</p>
<p></p> <p></p> <p>MPPT</p>	<p>MPPT: Maximum Power Point Tracking</p> <p>When the controller Power ON, The system Auto work with MPPT</p> <p>MPPT FUNCTION SETTING :</p> <p>When the <b>5</b>  light, Push the  again ,The MPPT indicator will light</p>
* Nate1:	<p>“RUNNING” Indicator Twinkle: System self-checking</p> <p>“RUNNING” Indicator Light: the Pump is running</p>

### 4 The Connect Way of The SK-197K1500-48 Solar Controller



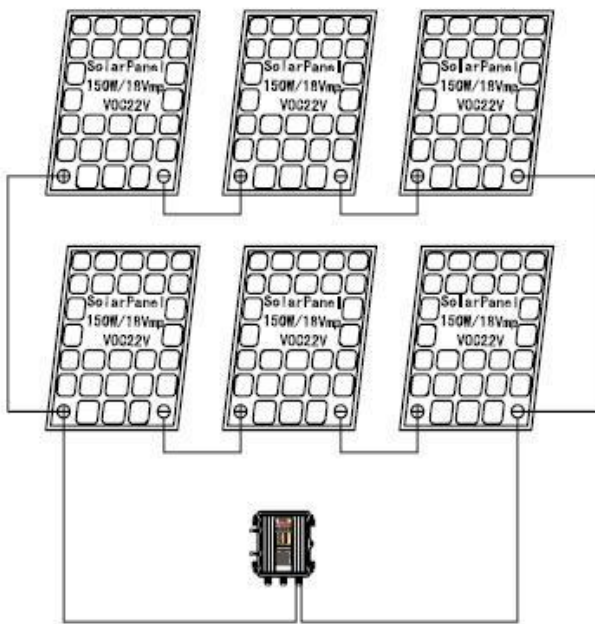
- TL and TH short circuit, The pumps stop;
  - TL and TH open circuit, The pumps run;
  - WL and COM short circuit, The pumps stop;
  - WL and COM open circuit , The pumps run;
- Nate: when the WL and COM from short to Open, the pumps will delay 10min to run.
- U V W Connect to Pumps;
  - Solar Energy Plate Connection Method



- ① Pump Running;
- ② Pump Running;
- ③ Pump Stopping;
- ④ Pump Stopping;
- ⑤ Pump Running.

## 4.1 The Solar Panel configure and Connection way

### 4.1 Configured by 18Vmp(Voc22V) Solar Panel



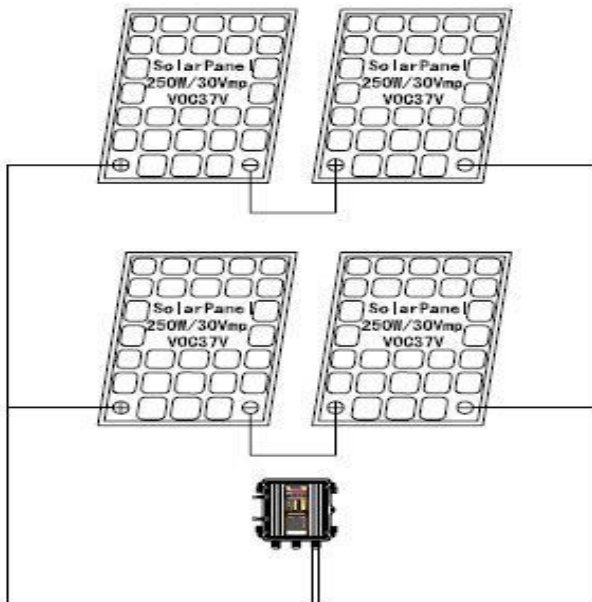
**INPUT:**

Solar Panel VMP= 18Vdc  
Solar panel VOC= 22Vdc  
Solar panel Power= 150W  
Solar panel Quantity= 6PCS

**OUTPUT:**

VMP= 54Vdc  
VOC= 66Vdc  
Power= 900W(MAX)

### 4.2 Configured by 30Vmp(Voc37V) Solar Panel



**INPUT:**

Solar Panel VMP=30Vdc  
Solar panel VOC=37Vdc  
Solar panel Power=250W  
Solar panel Quantity=4PCS

**OUTPUT:**

VMP=60Vdc  
VOC=74Vdc  
Power=1000W(MAX)

### 4.3 Configured by 36Vmp(Voc44V) Solar Panel

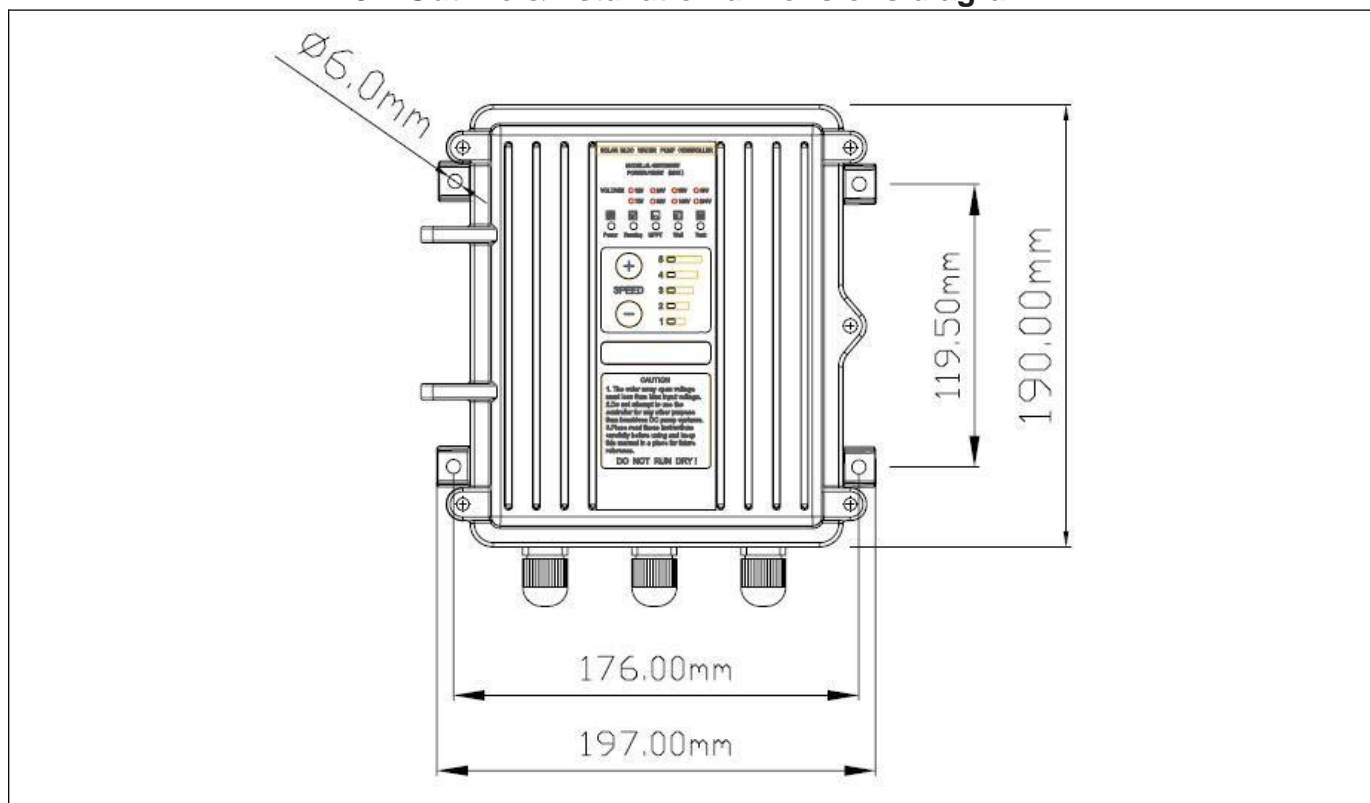
N.A

**INPUT:**

**OUTPUT:**

## 5. Mechanical and Electrical Installation

### 5.1 Outline & installation dimensions diagram



### 5.2 Mechanical Installation

#### 1. Overheat protection

The protection level of SK-197K Series solar pump controller reached IP67; if installed in the outdoor, the controllers should be installed in a well ventilated place, and avoid direct sunlight and rain. The best installation location is below the solar array, which can prevent the equipment from overheating and performance degradation. In extremely high temperature, high temperature may cause the controller stop to protect itself.

#### 2. Location Selection

The SK-917K Series solar pump controller is intended for operation in ambient temperatures up to 60 °C , but in order to avoid overheating caused by the failure, it is recommended to install the controller in the shadow position.

The SK-917K Series solar pump controller must be installed into a control box which has a tight enclosure to avoid direct sunshine, rain, dust, moisture, animals, plants, etc. The control box should have a bottom gland plate for installing wire cord or conduit. To decide the size of control box, Please refer to the following Figure 4.

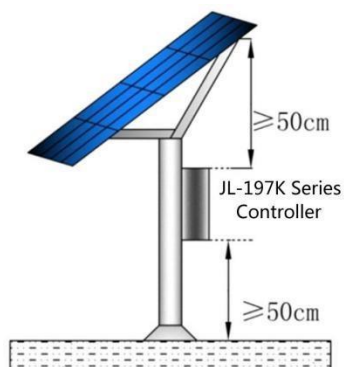


Figure4. Control Box Location

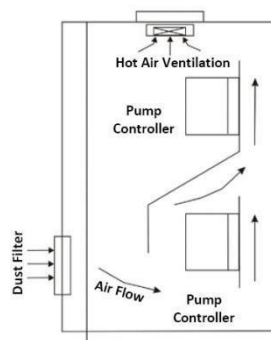


Figure5. Ventilation Arrangement and Required Distances