SOLAR POWER PUMP SYSTEM

USER MANUAL

MODEL: 4SSC10/146-D110/1800

4. Solar Panel Configure and Connection way

4.1 Configured by 30Vmp(37Voc) Solar Panel

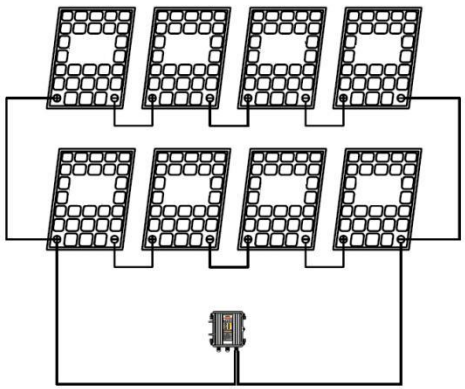
INPUT:

Solar Panel VMP=30Vdc

Solar Panel VOC=37Vdc

Solar Panel Power≥330W

Solar Panel Quantity=8PCS



OUTPUT:

VMP=120Vdc

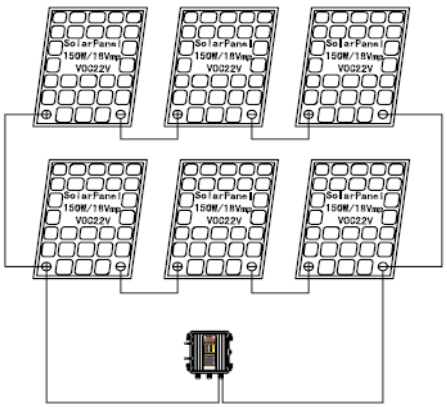
VOC=148Vdc

Power≥2640W(MAX)

4.2 Configured by 36-41Vmp(37-51Voc) Solar Panel

BLDC SOLAR PUMP SYSTEM

CONTENTS



INPUT:

Solar Panel VMP=36~41Vdc

Solar Panel VOC=44~51Vdc

Solar Panel Power≥440W

Solar Panel Quantity=6PCS

OUTPUT:

VMP=108~123Vdc

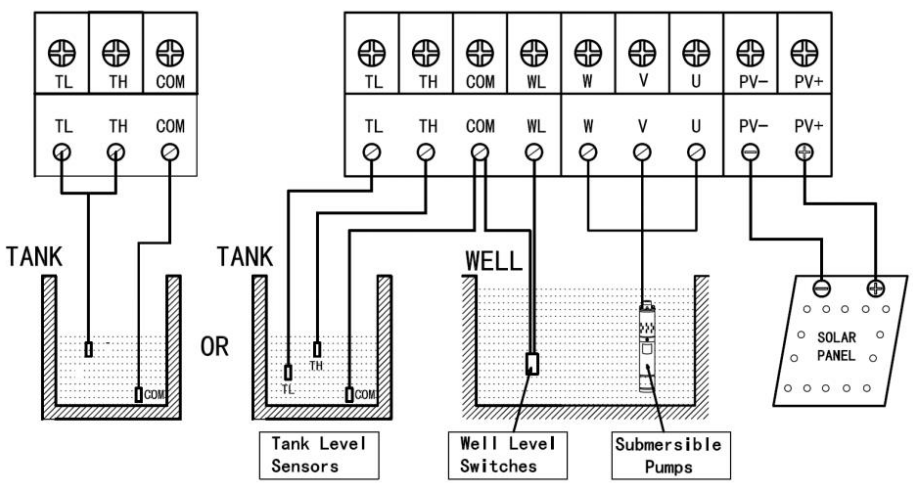
VOC=132~153Vdc

Power≥2640W(MAX)

BLDC SOLAR PUMP SYSTEM

3.6 WIRING INSTRUCTIONS

3.6.1 TOTAL DIAGRAM OF TERMINALS

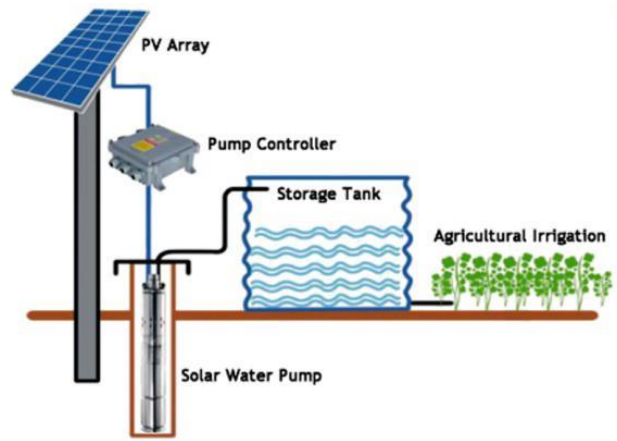


TERMINALS	CONNECT WITH
● PV+	PV panel positive

1、How It Works

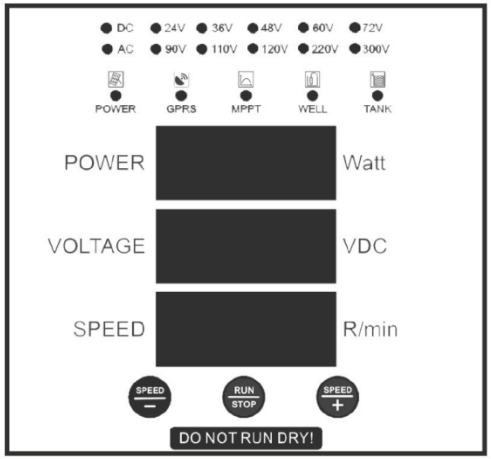
Solar pumping system serves to provide water in remote applications where electrical grid power is either unreliable or unavailable. BLDC solar pump controller can direct use the DC power from PV array, and drive the brushless DC pumps. In sunny days, the pumping system can continuously pump water. There is no need of batteries or other energy storage devices. It's recommended to pump water to a reservoir for storage.

A float switch can be installed in the water tower to control the pump operation. And install a low-level probe in well to detect the well water so that pump will stop when there is no water. Figure 1 shows a typical diagram of the solar pumping system, including major parts and components.



BLDC SOLAR PUMP SYSTEM

3.3 LABEL DESCRIPTION

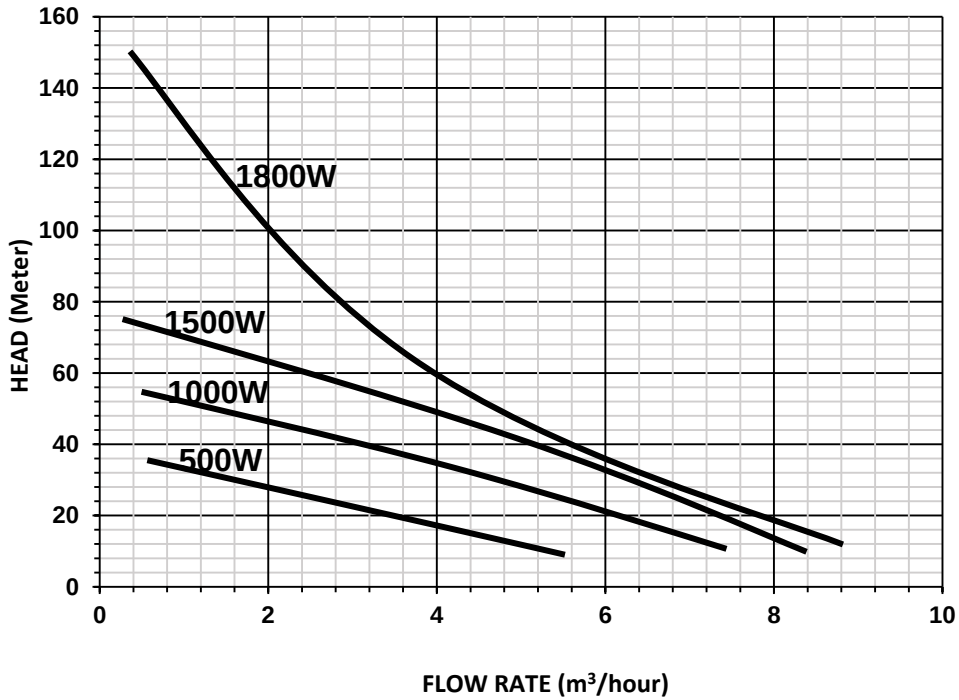


ITEM	DESCRIPTION	FUNCTION
DC 24V 36V 48V 60V 72V AC 90V 110V 120V 220V 300V	VOLTAGE	• **Controller Model=Rated Voltage**
POWER GPRS MPPT WELL TANK	INDICATOR LIGHTS	• **Power:** Light on=Power connected • **GPRS :** Flickering every 3s=Not connected Flickering every 1s=Connected • **MPPT:** Flickering=MPPT Mode On • **Well:** Light on, water level under sensor level • **Tank:** Light on, water level reach TH level
SPEED − SPEED +	SPEED CONTROL	• **Program Setting** • **Push to Adjust Speed or Timing**
RUN STOP	RUN / STOP	• **Push to RUN or STOP** • **Push to Confirm**
POWER Watt	POWER	• **Display Input Power**
VOLTAGE VDC	VOLTAGE	• **Display Input Voltage** • **Display Error Code**
SPEED R/min	SPEED	• **Display Motor Speed** • **Display CPU Temperature** Гoxx

2.3 PUMP PERFORMANCE

2.3.1 Pump Performance Chart

Head (m)	0	20	40	60	80	90	100	120	130	140
Flow (m^3/h)	10	7.8	5.8	3.8	2.5	2.2	1.9	2.0	1.2	0.4



BLDC SOLAR PUMP SYSTEM

3、JL-197K1500 Controller General Information

3.1 FEATURES

The JL-197K1500 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, inspect the JL-197K1500 solar pump controller unit. Verify that the part number is correct and no damage has occurred during transit.

NOTE: JL-197K1500 solar pump controller is the component of solar pumping system which has other two components, PV array and Brushless DC 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 Fold back

The JL-197K1500 solar pump controller is designed for full power operation from a solar array in ambient temperatures up to 45℃. In excess of 45℃ 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 JL-197K1500 solar pump controller can access two water level switches(well level sensor and tank level sensor) to detect remotely and control the pump automatically. Level switch for JL-197K1500 solar pump controller is optional, not mandatory.

3.2 TECHNICAL PARAMETERS

ITEM		**TECHNICAL PARAMETERS**
VOLTAGE	Rated Voltage	110VDC
	Max Open Voltage	200VDC
	Under Protection Voltage	**58 VDC**
	Over Protection Voltage	**168 VDC**
CURRENT	Rated Current	15 A
	Over Protection Current	18 A
	Peak Protection Current	20 A
MCU and Controller Mode		32bit MCU / FOC / Sine Wave Current / MPPT
Shell		Die-cast Aluminum
Dimension		197mm*190mm*98mm
Weight		2.1kg

over temperature sensing of the motor.

System Diagnostics

The JL-197K1500 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 from 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 JL-197K1500

solar pump controller will be operating. Whenever the JL-197K1500 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. This will not harm the motor due to the controller’s soft-start feature.

Cooling Mode	Heat Dissipation by fans
Operating temperature	-20℃ - +50℃
Storage conditions	-20℃ - +80℃/5～85%RH(No condensation)

BLDC SOLAR PUMP SYSTEM

2、4SSC10/146-D110/1800 PUMP DESCRIPTION

2.1 MATERIAL OF PARTS

PARTS OF PUMP	DESCRIPTION OF MATERIAL
Motor	Full Oil Permanent Magnet Brushless DC Motor (Without Hall)
Controller	32bit MCU / FOC / Sine Wave Current / MPPT
Controller Shell	Die-cast Aluminum
Outlet / Cylinder	304 Stainless Steel
Pump Body	304 Stainless Steel
Motor Body	304 Stainless Steel
Impeller	304 Stainless Steel
Screw	304 Stainless Steel
Cable	3 Cores / 2 Meters / 2.0mm^2

2.2 PUMP SPECIFICATION

ITEM	PARAMETER VALUES
Rated Voltage	110 VDC

3.4 PROGRAM SETTING

SETTING INTERFACE

SPEED [redacted] R/min

SPEED SETTING

① Under standby model, press SPEED + / SPEED − together to enter the setting page.

② Press RUN/STOP at **0001** to enter the speed setting page.

③ Press SPEED + or SPEED − to adjust the speed.

④ Press RUN/STOP to confirm.

TIMING SETTING

① Under standby model, press SPEED + / SPEED − together to enter the setting page.

② Press RUN/STOP at **0002** to enter the timing setting page.

③ Press SPEED + or SPEED − to adjust the timing.

※ ❶ *For example:* **003.5** *means the pump will turn off after 3.5 hours.*
❷ *Timing setting repeats every time after power-off, unless adjust to* **999.9** *to cancel.*
❸ *Countdown will pause when press STOP bottom.*

④ Press RUN/STOP to confirm.

3.5 LIGHT INDICATION

LIGHT	BEHAVIORS	CAUSE
POWER	• Light off	① No power input: a. Power line has a break (open circuit) b. PV+ and PV- terminals wrong connected ② Controller power system damaged ③ Fuse has blown.
VOLTAGE [redacted] VDC ※ Restarts automatically after protection.	• **E001**	• Under-voltage protection
	• **E002**	• Over-voltage protection
	• **E003**	• Over-temperature protection (70℃)
	• **E999**	• Default phase (open circuit) • UVW wires short circuit

BLDC SOLAR PUMP SYSTEM

Rated Power	1800 W
Maximum Flow	10 m^3/h
Maximum Head	146 Mtrs.
Outlet Size	1.5 inch
Outline Size	4 inch

BLDC SOLAR PUMP SYSTEM

NOTES FOR SAFE OPERATION

■ **BEFORE INSTALLATION** **WARNING**

◎ Do not install or operate damaged controller/pump or with missing parts.

◎ Ensure only qualified personnel to operate the system. Otherwise it may cause product damage or personal injury.

◎ Use correct PV panel configuration and cable size following the technical guide strictly. Otherwise, it may influence pump performance even result in damage to pump and controller.

◎ Maximum submersible depth of pump should ≤ 40 Mtrs. Otherwise, pump body may deform and the flow and head performance may reduce due to the high water pressure.

■ **INSTALLATION** **CAUTION**

◎ Install the controller in nonflammable material like metal. Otherwise it may cause a fire.

◎ The protective cabinet must prevent from moisture, insect or dust accumulation, which may cause abnormal working condition of controller.

◎ The protective cabinet needs to set vents to ensure ambient temperature is below 45℃. High temperature will damage the controller components.

◎ Use antistatic wrist strap while doing wiring. DO NOT touch the control board with hand directly. Static electricity on human body will cause breakdown on some components instantaneously.

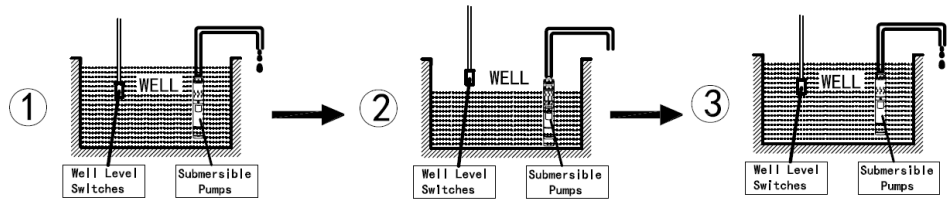
◎ Ensure PV array's positive (PV+) and negative (PV-) are connected to controller's PV+ and PV- terminals correspondingly.

◎ Ensure pump's U V W wires are connected to controller's U V W terminals correspondingly. Otherwise, the motor will run in reverse, and cannot give normal flow and head.

◎ DO NOT make pump's U V W wires short circuit. It may cause the fuse blow out.

◎ CONNECT EACH TERMINAL TIGHT. Otherwise, the large contact resistance and the operating

3.6.2 OPERATION OF WELL LEVEL SENSOR



①Pump runs	WL & COM short circuit
②Pump stops	WL & COM open circuit
③Delay 10-15 min to run	WL& COM from open to short

※ Push RUN/STOP button manually, system restarts immediately.

3.6.3 OPERATION OF TANK LEVEL SENSOR

current will cause the terminal to heat up severely.

◎ Make sure every joint of extension cable is tight and well waterproof.

WARNING

◎ Using dc breaker and surge protection device for safe purpose. Surge may cause big instantaneous current and make the fuse blow out.

◎ DO NOT touch any terminals at energized condition.

■ OPERATION CAUTION

◎ Do not open or remove the front cover of controller during running.

◎ In order to test the pump, the maximum DRY-RUN time should ≤ 15 seconds.

◎ If the pump turning is reversed, change any two lines of pump's UVW wires.

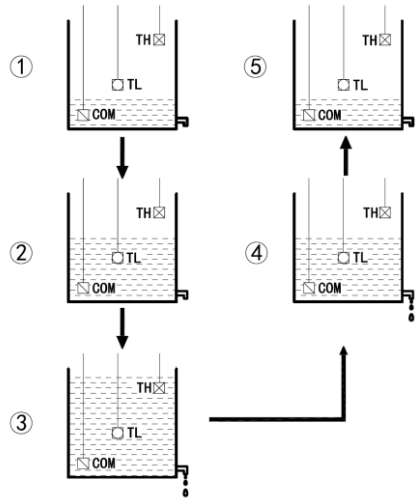
■ MAINTENANCE AND INSPECTION WARNING

◎ Only qualified or authorized professional personnel can maintain, replace and inspect the system. Otherwise it may cause damage or personal injury.

◎ Wait at least 10 minutes after the power failure, or ensure there is no residual voltage before carry out maintenance and inspection. Otherwise it may cause damage or personal injury.

■ AFTER-SALES

◎ If failing to follow above necessary instructions, resulting in damage to the system or personnel, it's not available to enjoy free warranty service from supplier.



① Pump Runs;

② Pump Keeps Running;

③ Pump Stops;

④ Pump Keeps Stopped;

⑤ Pump Runs again.

Sensor TL and COM is for detecting low water level.

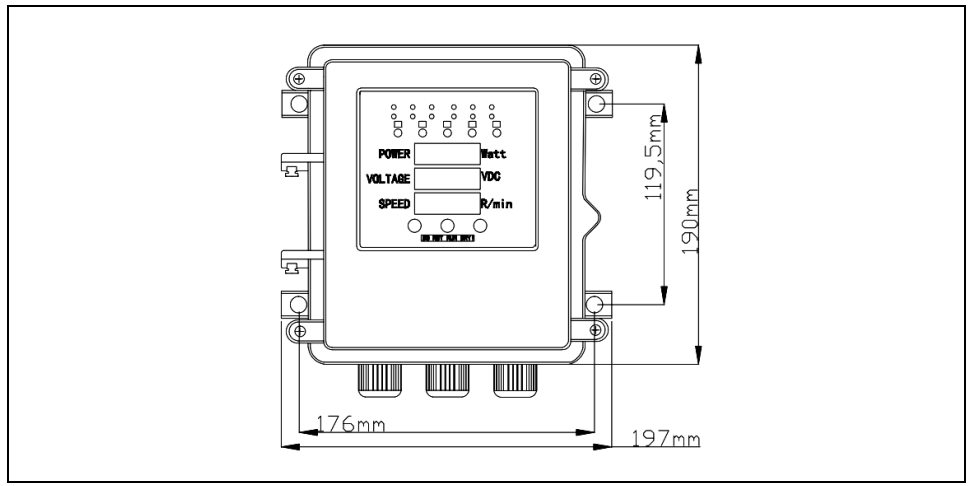
Sensor TH and COM is for detecting high water level.

Using 3 tank level sensors avoids the pump start/stop frequently.

BLDC SOLAR PUMP SYSTEM

5. Mechanical and Electrical Installation

5.1 Outline & Installation Dimensions Diagram



5.2 Mechanical Installation

5.2.1 Overheat Protection

If in the outdoor, the controller shall be installed in a well ventilated place, and avoid direct sunlight and rain. Extremely high temperature may cause the controller stop to protect itself. **Using dc breaker and surge protection device for safe purpose. Surge may cause big instantaneous current and make the fuse blow out.**

5.2.2 Location Selection

The JL-197K Series solar pump controller is intended for operation in maximum ambient temperatures up to 45℃. In order to avoid overheating caused by the failure, it is recommended to install the controller in a shadow position.

The JL-197K 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.

BLDC SOLAR PUMP SYSTEM

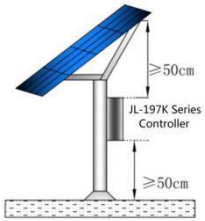


Figure 4. Control Box Location

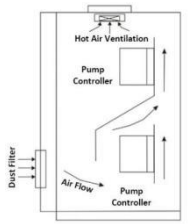


Figure 5. Ventilation Arrangement & Distances