1、JL-197K1500 Controller General Information

1.1 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 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.

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.

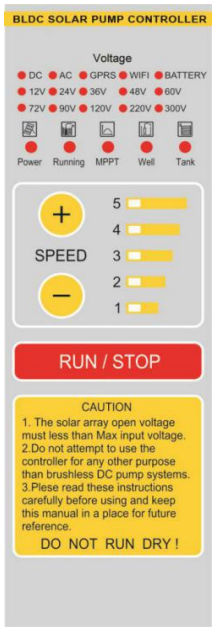
Level Control Switch

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.

1.2 TECHNICAL PARAMETERS

ITEM		TECHNICAL PARAMETERS
Voltage	**Rated Voltage**	**12-120 VDC**
	Max. Open Voltage	**200 VDC**
	Under Protection Voltage	**30 VDC**
	Over Protection Voltage	**145 VDC**
Current	Rated Current	18 A
	Over Protection Current	20 A
	Peak Protection Current	25 A
MCU and Controller Mode		32bit MCU / FOC / Sine Wave Current / MPPT
Shell		Die-cast Aluminum
Dimension		197mm*190mm*98mm
Weight		2.2kg
Cooling Mode		Heat Dissipation by Fans
Operating temperature		-20℃ ~ +50℃
Storage conditions		-20℃ ~ +80℃ / 5 ~ 85%RH(No condensation)
Operating mode		S1 (Continuous working)

1.3 LABEL DESCRIPTION



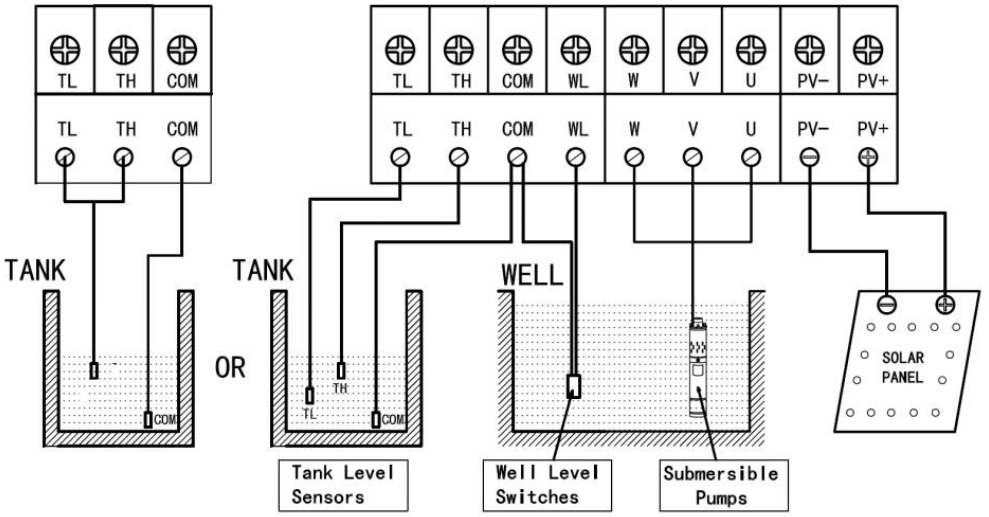
DC AC GPRS WiFi BATTERY 12V 24V 36V 48V 60V 72V 90V 120V 220V 300V	• **Rated Voltage**
Power Running MPPT Well Tank	• **Power:** Light on, power connected • **Running:** Light on, motor running • **MPPT:** MPPT mode indicator light • **Well:** Well level indicator light • **Tank:** Tank level indicator light
MPPT	• **Push + at speed 5 to MPPT mode**
SPEED	• **Speed Control** • **Push + to add speed** • **Push − to reduce speed**
RUN / STOP	• **Push to RUN or STOP**
CAUTION	• **Cautions shall be noticed**

1.4 LIGHT INDICATION

LIGHT	BEHAVIOURS	CAUSE
Power	• **Light OFF**	① **No power input:** a. Power line has a break (open circuit) b. PV+ and PV- terminal wrong connected ② **Controller power system damaged**
	• **Only POWER light ON, other lights OFF.**	① **During Over-voltage protection**
Running	• **Flickering for long time, Motor no running.**	① **Not enough power input** ② **Motor phase default** a. UVW wires joint non water-proof b. UVW wires has break c. Terminal poor contact ③ **Motor insulation failure**
MPPT Well Tank	• **Flickering together**	① **During Over-temperature protection**

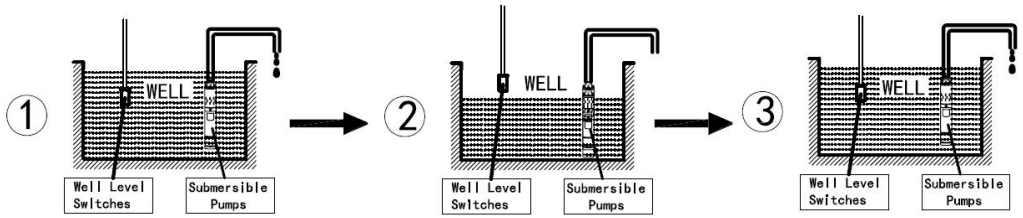
1.5 WIRING INSTRUCTIONS

1.5.1 TOTAL DIAGRAM OF TERMINALS



TERMINALS	CONNECT WITH
• **PV+**	**PV panel PV+**
• **PV-**	**PV panel PV-**
• **U V W**	**Pump motor U/V/W wires**
• **TL & TH & COM**	**Tank water level sensor**
• **WL & COM**	**Well (borehole) water level sensor**

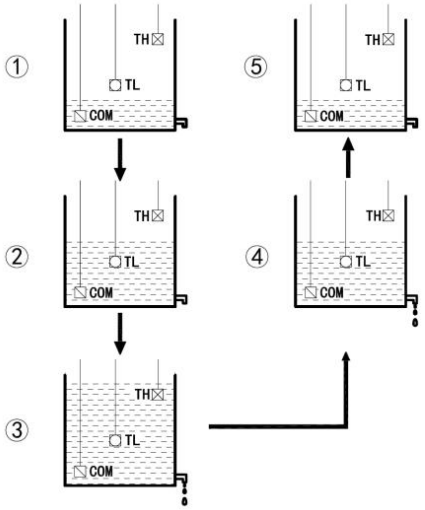
1.5.2 OPERATION OF WELL LEVEL SENSOR



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

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

1.5.3 OPERATION OF TANK LEVEL SENSOR



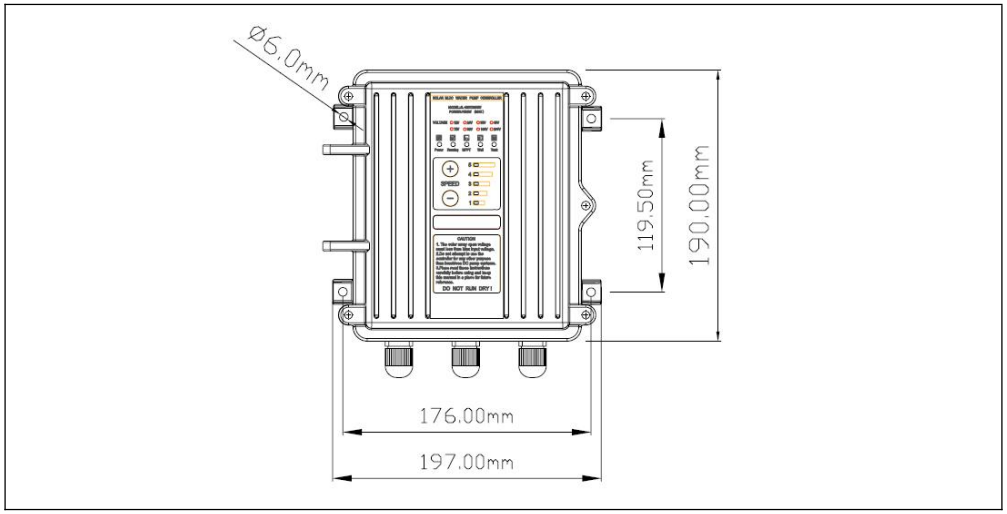
① Pump Runs;
② Pump Keeps Running;
③ Pump Stops;
④ Pump Keeps Stopped;
⑤ Pump Runs again.

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.

2. Mechanical and Electrical Installation

2.1 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.

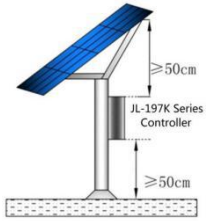


Figure 4. Control Box Location

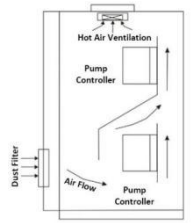


Figure 5. Ventilation Arrangement & Required Distances