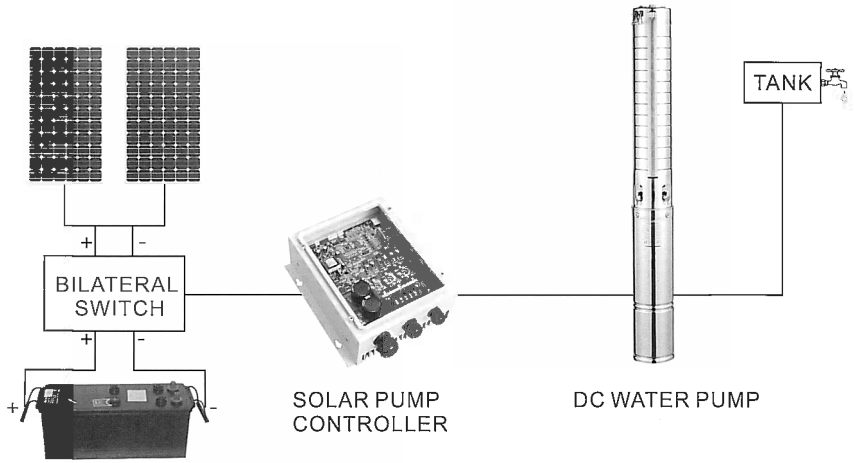
DC Solar Pump User Manual

1. DC SOLAR PUMP WITH CONTROLLER

A. Operating principle



Solar photovoltaic panels convert sunlight energy to electricity energy through solar pump controller. The solar pump controller stabilize the voltage and creates a three phase output to drive the electric motor of the pump.

a、Selecting the solar panel of pumping system

If you don' t buy the complete system from your supplier, the following formula will be very helpful for you to choose the solar panel.

a. Solar PV panel(solar panel) selection:

Power of solar panel(watts)=Rated power of water pump(watts) X (1.2-1.3) times

Best working Voltage of solar panel=Rated voltage of water pump(V) X (1.0-1.4) times

The controller have already been matched to the pump by your supplier.

Eg. 300 watts water pump needs the minimum power of solar panel is :300X1.3=390w, The selecting power of solar panel will be according to local sunlight strength.

b. You may need combine the solar panel, especially the big power solar pump systems. You can get the solar panel in series in one line to reach the your demanding voltage, and you can get the solar panel in parallel to reach the demanding current of the water pump.

Solar panel in parallel, add the current and the power(watt) of the solar panel.

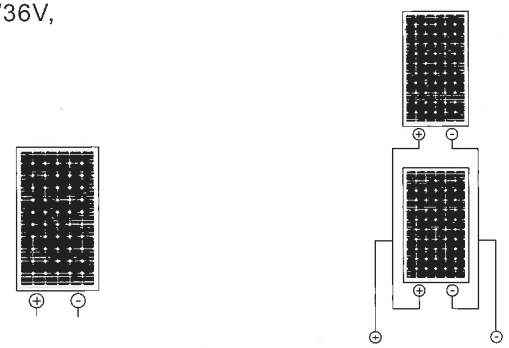
Solar panel in series, add the voltage and the power(watt) of the solar panel.

Eg. 2X12 volt 100 watts solar panel in paralles becomes a 12V 200 watt system

2X12 volt 100 watts solar panel in series becomes a 24V 200 watt system

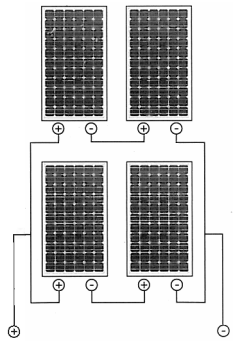
For example:

For pump of 24V/36V,



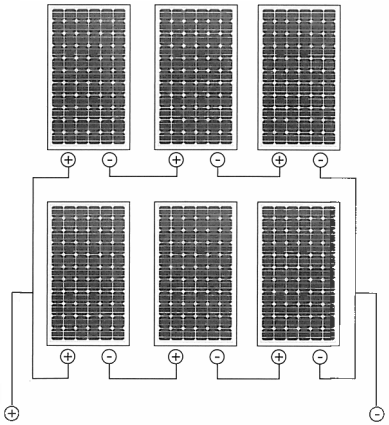
Solar Panel Type: 250W/300W

For pump of 48V/60V,



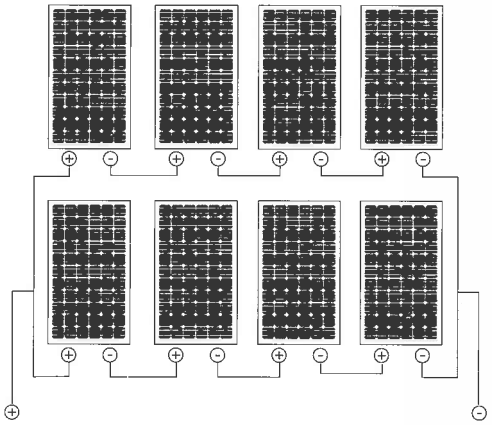
Solar Panel Type: 250W/300W

For pump of 72V/96V



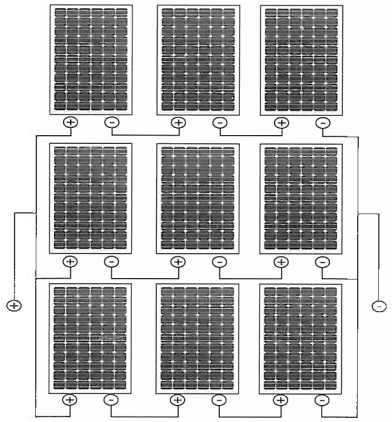
Solar Panel Type: 250W/300W

For pump of 108V/120V



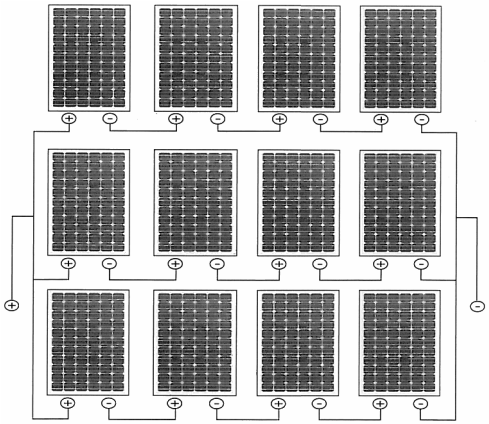
Solar Panel Type: 250W

For pump of 108V/120V



Solar Panel Type: 250W

For pump of 108V/120V



Solar Panel Type: 250W

B、Selecting the battery of the solar pump system.

You will need to buy the battery if you want to the water pump working when it is not sunny, please note, if you want to add the battery, you should buy the solar battery charging systems. And the way to select the power of battery will be according to how much time need the water pump work when it is not sunny, pls read following way:

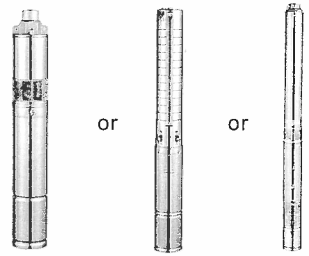
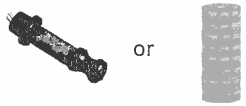
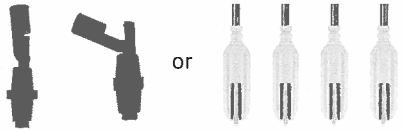
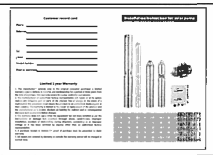
For example,the machine power is 200w, the battery capacity is 100AM, the voltage is 12V and the battery is fully charged, then the use hour is: 100÷(200÷12)×0.6=3.6hours

The battery capacity= the use hour ÷0.6X(the machine power÷the battery voltage)

For example, the machine power is 200w, the battery voltage is 12V and the battery need to be used for 3.6 hours, then the battery capacity is:3.6÷0.6X(200÷12)=100AH

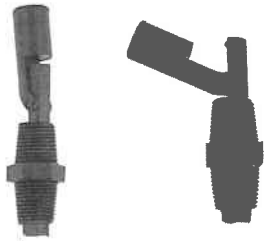
2、PACKING LIST

Open the package and check all the parts been supplied.

Product List		
Solar pump	1pc	 or or
Controller	1pc	
Impeller	1pc	 or
Cable connector	4pc	
Water Level sensor	2pcs or 4pcs	 or
Rope	1pc	
Manual	1pc	

note:

1.the situation of water level sensor



close open

If the well has no water, the water level sensor will change from close to open, then, it will stop the pump motor working
If the tank is full, the water level sensor will change from open to close, then, it will stop the pump motor working.

2.following water level sensor install should be very close, the closer ,the better. can not be more than 10cm

3.Installation

(1). Wiring the pump

Connecting a longer cable to the pump,(size of cable must be at least 1.5mm²)
Use the parts contained in the cable connector kit(heat-shrink tube and tape) to connect a longer supply wire to the pump. If you don' t have a heat gun to shrink the tube, the barrel of your soldering iron will do or you can use a butane torch but with great care so you don' t melt the insulation or set it on fire. Bare the insulation back as shown above.

1/Layout the components needed to make the join
2/Put the large diameter piece of heat-shrink over the main cable and then the smaller diameter pieces over the individual wires, keeo the heat-shrink back away from the joints as you solder them. Any heat transfer will prematurely shrink the heat-shrink.
3/4. Slide the small heat-shrink over the soldered joints and heat using a heat gun or alternative heat source to shrink the sleeve down over the wires.
5/ Wrap the tape over the sealed joints
6/ Finally slide the large diameter heat-shrink over the completed joint and shrink to it.

Place the pump in water before you start wiring the controller boxm this will allow the pump to go through the pre-conditioning required. Do not put the pump in its final position until you have tested it, unless it is easy to see and remove.

(2). Solar pump control box

① Function of solar pump controller box:

A. Low-voltage protection (it is automatic)

B.overcurrent protection(it is automatic)

C. Locked rotor protection

D. Temperature protection

E. lack of phase protection

F. protection for low water level in well(K1,GND sensor)

G. protection for full water level in tank(K2,GNDsensor)

H. Controlling running speed of motor(speed regulator)

I. Delay working when full water in tank(A timer inside can delay working for 10mins when the tank going to not full)

J. Delay working when low water in well(A timer inside can delay working for 10mins after the pump stops working from low water level protection in well)

K. MPPT function.(maximum power point tracking)

L. Battery is optional.(battery can be used with solar charger battery system)

② Technical parameters of controller box

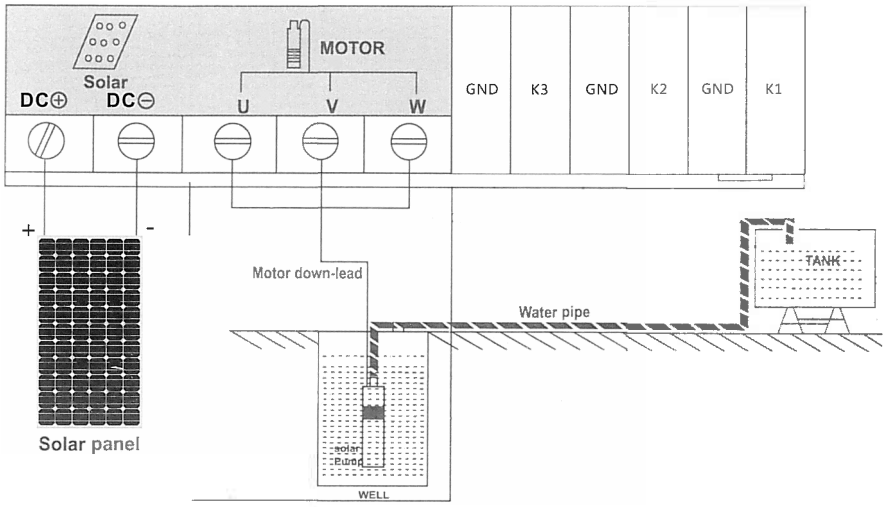
Rated voltage(VDC):	24	36	48	60	72	96	108	120
Rated current(A):	15	15	15	15	15	15	15	15
Max current(VDC):	20	20	20	20	20	20	20	20
Max power(W):	480	720	960	1200	1450	1850	2200	2500
Max open voltage(VDC):	65	65	160	160	160	160	160	160
Dimension(MM):	280*210*110	280*210*110	280*210*110	280*210*110	280*210*110	280*210*110	280*210*110	280*210*110
Weight(KGS):	3.3	3.3	3.3	3.5	3.5	3.5	3.5	3.5
Ambient Temperature:	-20℃~+50℃	-20℃~+50℃	-20℃~+50℃	-20℃~+50℃	-20℃~+50℃	-20℃~+50℃	-20℃~+50℃	-20℃~+50℃

(3).Wiring the controller box.

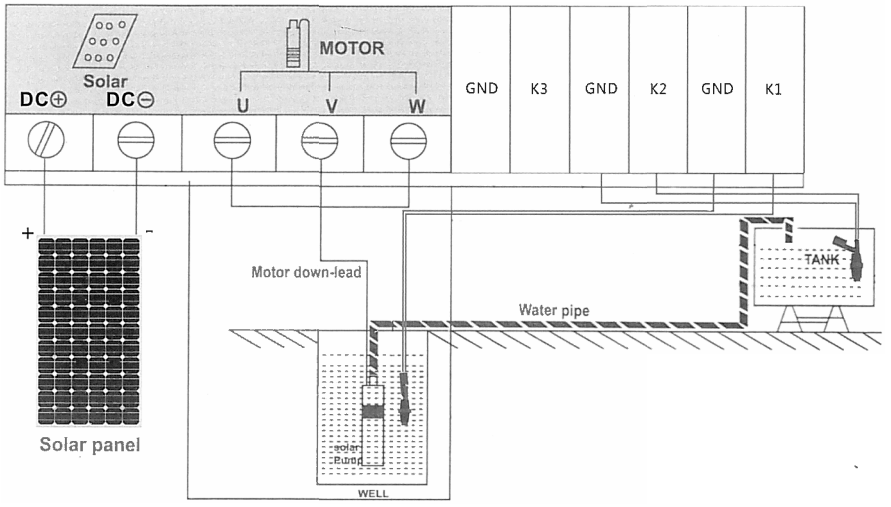
Before you start wiring the control box ,switch must be in the off position

1/ wire the pump, panels to the control box as per the wiring diagram below. when wiring the pump do not worry about the wiring orientation, just connect the pump wires to the controller mading sure they do not touch each other. later when we test the system if the wiring is incorrect the pump will run backwards and you will only have to swap over two wires to get it running correctly. you have a 50:50 chance of getting it correct the first time

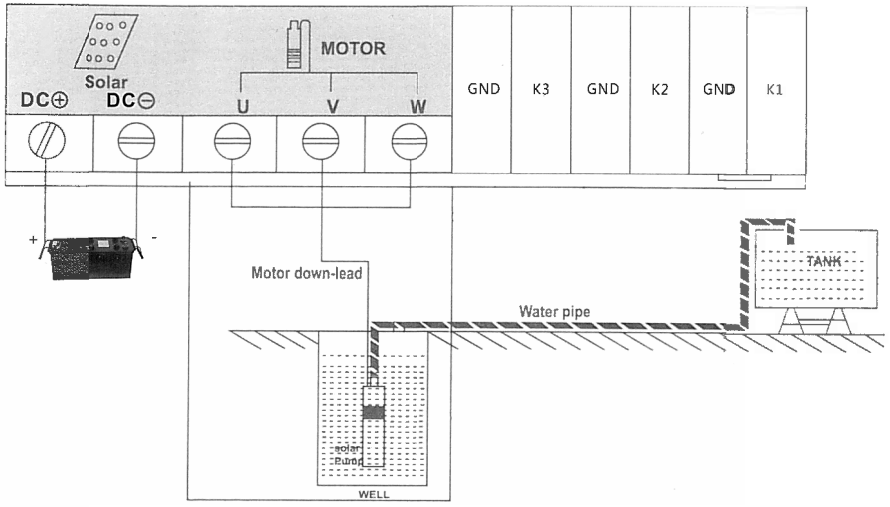
A.Input :Solar Panel,no Water Level Sensor



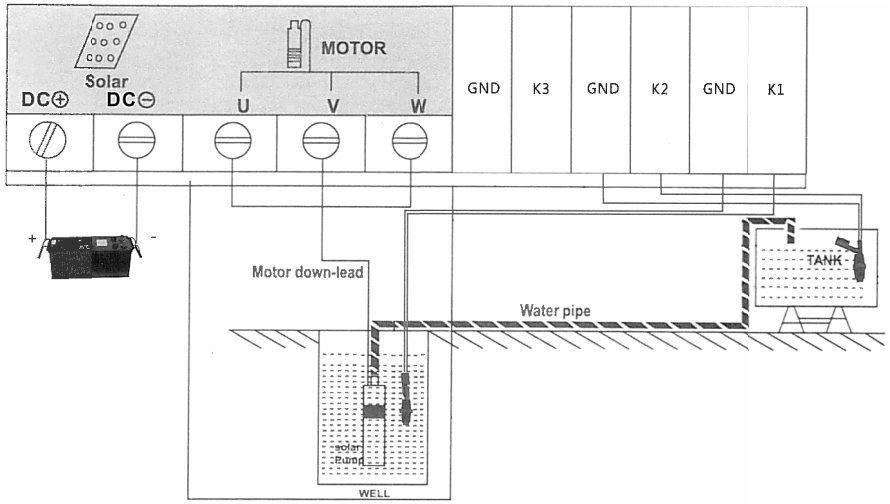
B.Input :Solar Panel,With Water Level Sensor



C.Input :BATTERY,no Water Level Sensor



D .Input :Solar Panel,With Water Level Sensor



4. TESTING THE PUMP

Before you testing the pump, the controller box switch must be in the off position.

The pump must be under water at all times and should have been pre-conditioned for at least 1 minutes. Water is the lubrication for the pump and if it is not "preconditioned" properly the bearings will not be adequately lubricated. Do not attempt totest the pump if even for a moment without it being submerged or permanent damage will occur. You will need a large container so the pump does not pump it dry in seconds.

1/ Attach a durable rope or stainless steel cable to the top of the pump using the mounting hole. Make sure the rope or cable is longer than the depth at which you want to install the pump. This is used to raise and lower the pump. Never use the power cable to do this.

2/ Very important! Attach the (GND,K1) sensor with a tie wrap to the pump cable so it will be at least 0.5 metres above the pump body when it is installed, the higher the better.

3/ Connect the water line and lower the pump into the bore hole, well, stream lake etc. Please note the pump must be operated vertically so the bearings have no excess side thrust on them and the water should be clean with no corrosive materials in it. The pump must be at the correct depth. Do not put the pump any deeper than 20 metres in the water. Depending on the water source the level can drop when water is drawn off so the sensors need to be placed to account for this otherwise it will be stopping and starting.

4/ The PV panels need to be in full sun. Turn on the control switch. The pump has a "soft start function" and will start after 10 seconds and then spin up to full speed in the next 6 seconds.If the wiring is correct the pump will restart and the pump will run continuously.If the pump does not pump much water it is possible the wiring of the pump is incorrect and it is running backwards. To correct this switch off the control box and reverse the wires to terminals U and V. Switch the controller on again and the pump should now be working correctly after self-diagnostics.

If this does not happen see the trouble shooting guide

5/ Test the sensors one at a time. take the low water level sensor from the well, the pump should stop immediately. Put the sensor back under water, the pump should start after 10mins delay. put the full water level sensor in well into the water the pump should stop immediately,take the sensor out of water,the pump should start after 10mins delay

5.TROUBLE SHOOTING

light	Reason	solution
Alarm: flash 1 times	power source not stable or Power down detection	checking the solar panel connection carefully whether it is ok. or pls close and open the switch again
Alarm: flash 3 times	the pump impeller is stoped by something	pls check the pump impeller is working good or not
Alarm: flash 4 times	MOSFET part is broken	change the broken mosfet or change the new controller
Alarm: flash 6 times	the controller temperature is too high	pls check the input solar panel power is too much or not

Alarm: flash 7 times	over-current protection	pls check the input solar panel power is too much or not, and check the water pump have problem or not
Alarm: flash 8 times	under-voltage protection	pls check the input solar panel voltage whether it is enough
Alarm: flash 9 times	Lack of phase protection	pls check water pump U,V,W three phase
Alarm: flash 10 times	Phase to ground short circuit	check water pump U,V,W three phase line is connecting to the outside box directly
POWER	Solar panel input indicate	when it is off, pls check the input solar panel connection input
running	motor running	when it is off, pls check the connecting of water pump
tank	tank full	pls check the tank is full or not, if it is not full, this light is on, pls check the water level sensor connection
well	well is empty	pls check the well have water or no, if there is water , the light is on, pls check the water level sensor connection

6. DOS AND DON'TS

Do keep the pulnp under water at all times when operating
Do be careful with wiring
Do remove the pump if not used for a
with vegetable oil.
ong time and wipe the screw and body. Wipe
Do make sure the pump has adequate water around it during pumping.1f the sensors are activated there will be at least a 30minute delay between pumping sessions.
Do put your solar PV panels in a sunny position facing true north (southern hemisphere) or true south (northern hemisphere).If the panel angle is fixed then an angle equal to your latitude will be a good compromise.
Don't run the pump out of the water, even momentarily. It will void the warranty
Don't adjust the regulation bolt in the base of the pump. It is factory set. It will void the warranty.
Don't use the pump in dirty water. Premature wear will not be covered by warranty.
Don't disassemble the control box. There are no user parts inside

Customer record card

Name _____

Address _____

_____

_____

Tel _____

Email _____

Model number _____

Date of purchase _____

Limited 1 year Warranty

1. The manufacturer extends only to the original consumer purchaser a limited warranty against defects in material and workmanship for a period of three years from the date of purchase. This warranty covers the pump, controller and sensors.
2. The manufacturer or authorized factory representative will repair, or at its option replace any defective part or parts of the product free of charge. In the event of a malfunction the purchaser must return the product to an authorized dealer/agent at their expense. The warranty is limited to the repair or replacement of the product and the manufacturer or it dealers disclaim all liability for indirect and or consequential damages such as any installation charges.
3. The warranty does not apply when the equipment has not been installed as per the instructions or damage has occurred through abuse, carelessness, improper installation, accident of mishandling during shipment, connecting to an improper voltage or it has been serviced by anyone other than an authorized factory representative.
4. A purchase receipt or invoice for proof of purchase must be presented to claim warranty.
5. All repairs not covered by warranty or outside the warranty period will be charged at normal rates.