SunWize
Age of Power Autonomy

Document # 310014

Sunwize Water Pumping Kit

Quick Start

The purpose of this guide is to assist you in setting up your system quickly and efficiently.

Important! Prior to field installation

Determine and fill in the information below. Refer to http://www.ngdc.noaa.gov/geomag-web/#declination to determine required information using site Lat./Long. or zip code. See page 4 for detailed instructions.

Array tilt angle _____

Magnetic declination _____

See inside for list of required tools and additional materials.

Share your installation photo:
email to marketing@sunwizepower.com

For technical support call 866-827-6527

System Parts List

PV Modules
PV-Module mount
PV-Module output conductor kit
Pump Controller
Installation Kit
(Optional) DC Disconnect
(Optional) Float Switch

You will need to supply these parts (not included):

Galvanized steel pole - 2”-8” sch 40 (if required)
Equipment grounding - ground per local electrical code
UV resistant cable ties

You will need these tools:

Wide, medium, and narrow flat head and Phillips screwdrivers
Socket driver set and open end wrenches (3/8” - 3/4”)
5/32” Allen Wrench
3/16” Allen wrench
Magnetic compass
Tape measure
Grease pencil, chalk, scribe, or other marker
Digital multi-meter
Digital clamp on Amp meter (optional)

Photovoltaic (PV) modules generate electricity when exposed to light. Modules pose a shock hazard and risk of serious injury or death if instructions and safety precautions are not followed carefully. Cover the glass faces of the modules with opaque material while working on the system to stop the production of electricity. Avoid touching the terminals and isolate wire end until all connections are complete.

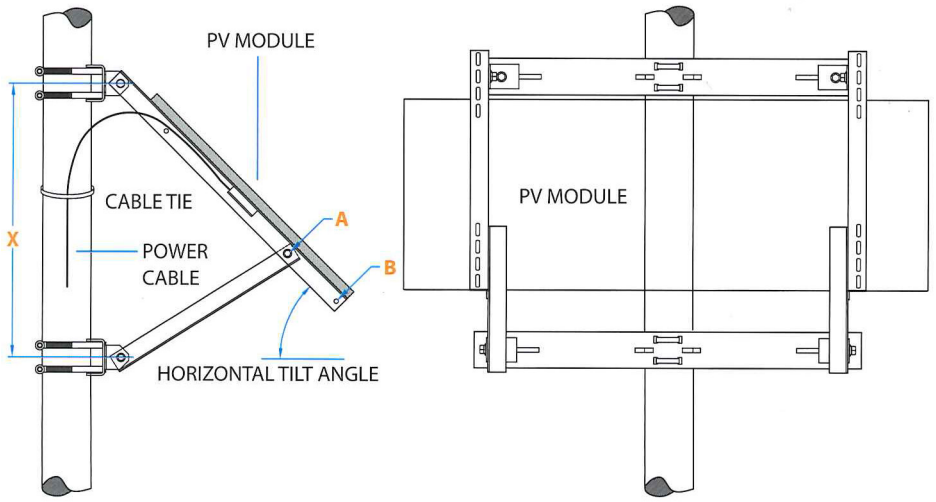
Batteries can explode or severely burn if the terminals are shorted to the opposite polarity. A single point system ground is required per NEC A.690. It is recommended to tie the battery negative (-) terminal to the equipment chassis at the time of installation. Always observe proper polarities when making electrical connections to the modules, batteries, and controller.

1 System Installation

PV Mount Installation

Attach top of array structure to pole at desired maximum height using supplied band clamps or u-bolts per the manual provided with the mount.

Assemble the rest of the mount per the manual and adjust the mount to the desired angle of tilt.



Images for reference only

Pump Controller Installation

When mounting the controller, make sure it is mounted in a vertical position. The controller must be mounted vertically to cool properly and to keep the electroinics dry.

It is recommended to mount the controller on the north side of the PV array mounting pole. This not only reduces the wire run from the array to the controller, but also helps keep the controller cool under the shade of the array.

DC Disconnect Installation (Optional)

When using a DC disconnect, it should be mounted somwhere inbetween the PV array and the pump controller. The disconnect should be easily accessible.

2a Electrical Installation

Grounding

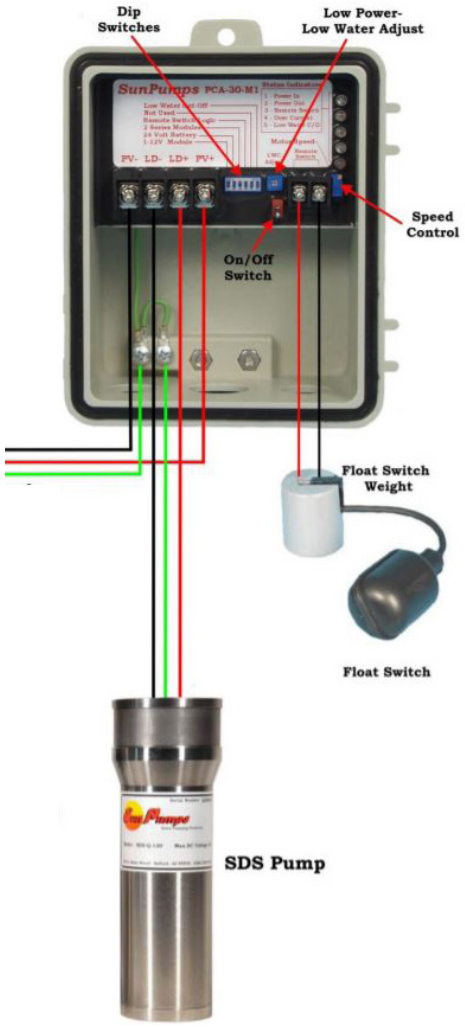
Set controller to OFF position

Controller must be grounded, with its ground lug, to an 8-foot ground rod.
Use wire rated for outdoor use per local codes and size per NEC A.690 for system earth grounding. Verify system neutral bonding is per local code.

Pump Wiring

Set controller to OFF position

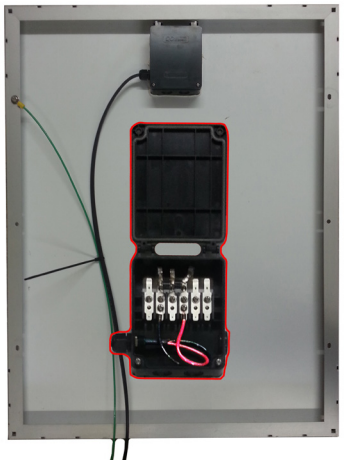
1. Connect the green pump ground connector to controller chassis ground block.
2. Connect pump motor leads to the “Pump” terminals on the controller. Red to LD+ and black to LD-.
3. (Optional) Connect the float switch leads to the remote switch terminals



2b Electrical Installation

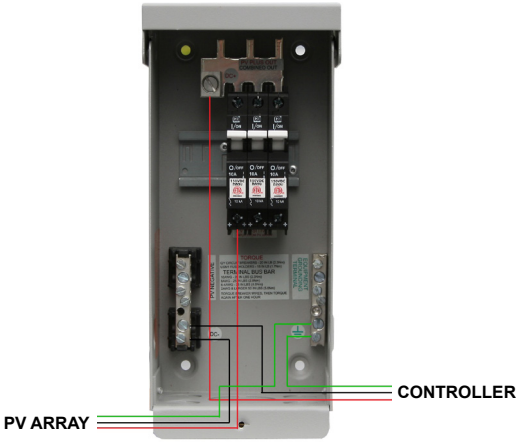
PV Array Wiring (Direct)

1. Route the output conductors from the PV array to the controller. Secure the conductors to the PV panel frame or the mounting surface using wire ties or other restraining hardware (not provided). Install the cord grip fitting to the bottom of the controller using the 1/2 inch knock out provided.
2. Inside the controller, mate the RED PV(+) conductor to the controller PV(+) terminal block. Mate the BLACK PV(-) conductor to the controller PV(-) terminal block. Mate the PV array GREEN GND conductor to the controller ground lug.
3. For all connections use correct interconnect cables and tray cable (see figure right).

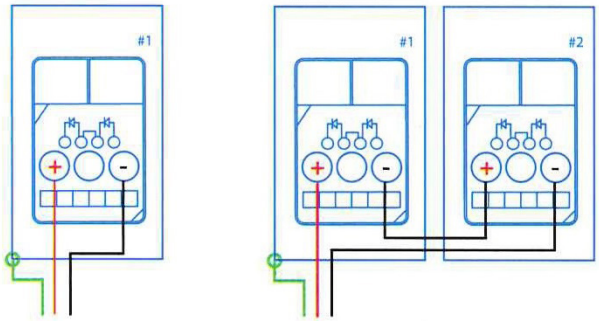


PV Array Wiring (Disconnect)

1. Split the provided tray cable and module grounding wire into two lengths. One that will reach from the PV array to the disconnect and one that will reach from the disconnect to the controller.
2. Route the output conductors from the PV array to the disconnect box. Secure the conductors to the PV panel frame or the mounting surface using wire ties or other restraining hardware (not provided). Install the cord grip fitting to the bottom of the disconnect using the 1/2 inch knock out provided.
3. Route conductors from the disconnect box to the controller. Install a cord grip fitting to the bottom of both the disconnect and controller.
4. Inside the disconnect, mate the RED PV(+) conductor to the bottom of the DC breaker and the RED Controller(+) conductor to the positive combiner lug. Mate both the BLACK PV(-) conductor and BLACK Controller(-) conductor to the negative bus bar. Mate both GREEN GND conductors to the ground bus bar.
5. Inside the controller mate the RED(+) conductor to the PV(+) terminal block. Mate the BLACK(-) conductor to the PV(-) terminal block. Mate the GREEN GND conductor to the controller ground lug.
6. For all connections use correct interconnect cables and tray cable (see figure right).



1 Module **2 Modules**



Wiring Legend

RED - POSITIVE
BLACK - NEGATIVE
GREEN - GROUND

3 Test the PV System

Confirm all connections, fittings, and fasteners are secure and the PV array surface is clean and facing South.

Measure Voltages (Confirm controller/disconnect are off before measuring)

Verify the PV polarity is positive. If negative, reverse wiring to the system and check again.

****WARNING****
REVERSE POLARITY CAN RESULT IN NON-WARRANTIED PRODUCT DAMAGE

Measure PV array voltage from the PV(+) terminal to the PV(-) terminal in the controller. (If you have a DC disconnect measure the voltage from the PV(+) bus bar to the PV(-) bus bar in the combiner box)

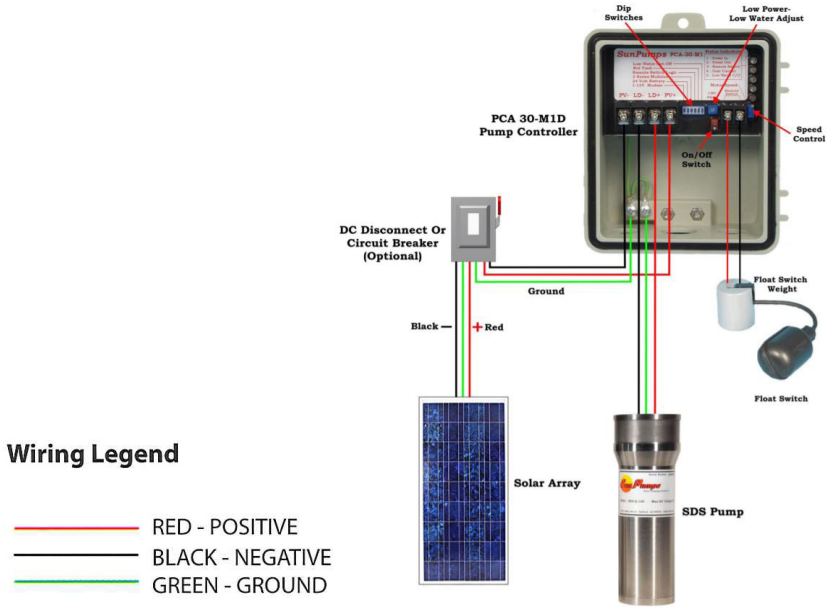
24V WPK systems	**42VDC** (open circuit voltage)

Set controller/disconnect to the ON position

1. Set controller power switch to the ON position
2. If you have a DC disconnect, set the breaker to the ON (closed) position.

Confirm that the controller status LEDs function properly.

The system should now be operational. If the system will not start refer to the trouble shooting guide in the pump controller manual.



4 Calculate Installation Tilt and Azimuth

For optimum performance, your PV array should face true south in the Northern Hemisphere (and true north in the Southern Hemisphere). However, when determining direction using a magnetic compass, indicated bearings will vary from true bearings because of the difference between the location of the true and magnetic north poles. This angular difference varies with location on the globe and is called the “declination.”

- Locate your using the web site below. (Great accuracy is not critical).
- Using the magnetic declination from the web site calculate true South. For example, the declination for Washington, D.C., is approximately -11º; for Chicago, IL, -3º; and for Los Angeles, CA, +14º.
- Determine magnetic south at your site using a magnetic compass.
- If the local declination found in step 2 is negative, true south is that number of degrees added to magnetic south. For example, at Washington, D.C., true south is the same as 180º + 11º = 191º indicated. If the local declination found in step 2 is positive, true south is that number of degrees subtracted from magnetic south. For example, at Los Angeles, true south is the same as 180º – 14º = 166º indicated.
- Orient your array in the direction of true south (or north if applicable) as determined above.
- The Internet site http://www.ngdc.noaa.gov/geomag-web/#declination will calculate magnetic variation from an input of latitude and longitude, or Zip code.

For optimum performance, your PV array should set to a specific tilt angle. To determine the desired tilt angle of the array, use the latitude from step one above.

Take this value and add the factor based on the table below. This will provide the optimum worst case performance with the minimum amount of annual adjustment, based on the winter months (Northern hemisphere).

Latitude range between 90 – 45° SET TO 60°
Latitude range between 40 – 25° +15°
Latitude range between 25 – 15° +5°
Latitude range between 10 – 0° SET TO 15°