TOOLS
&
COMPONENTS
SAFTEY FIRST

Use protective eyewear at all times. Wear long pants and supportive footwear, the roof is hot and will get slippery when wet! A tool belt will keep your hands free.

TOOLS

Hammer Drill
Impact Driver
Rotary Impact Drill
Wire Crimper

3.8 x 1.25” Bolt
8 per panel

Nut
8 per panel

Washer
8 per panel

3.5” Roofing Screw
4 per panel
### COMPONENTS

#### Solar Panel 250 W

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Power</td>
<td>250 WP</td>
</tr>
<tr>
<td>Open circuit voltage</td>
<td>37.6 V</td>
</tr>
<tr>
<td>Maximum power point voltage</td>
<td>30.5 V</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>8.81 A</td>
</tr>
<tr>
<td>Maximum power point current</td>
<td>9.27A</td>
</tr>
<tr>
<td>Module efficiency</td>
<td>14.91%</td>
</tr>
</tbody>
</table>

**Unit Dimensions:** 39.4” x 56.49” x 1.3” and 39.7 lbs (18.0 kg)

Poly-crystalline cells with 60 cells per module

#### Solar on Grid Tie Inverter with Power Limiter PV system

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Power Output</td>
<td>980 W</td>
</tr>
<tr>
<td>Peak Power Output</td>
<td>1000 W</td>
</tr>
<tr>
<td>Input DC Voltage Range</td>
<td>22V-60V/45V-90V</td>
</tr>
<tr>
<td>Peak power tracking Voltage</td>
<td>25V-60V/50V-90V</td>
</tr>
<tr>
<td>AC Output Voltage Range</td>
<td>90V-140V/190VAC-260VAC</td>
</tr>
<tr>
<td>Output Frequency</td>
<td>46Hz ~65Hz</td>
</tr>
<tr>
<td>Peak Inverter Efficiency</td>
<td>92%</td>
</tr>
<tr>
<td>Weight</td>
<td>3.6 kg</td>
</tr>
<tr>
<td>Dimensions</td>
<td>322 x 196 x 88 mm</td>
</tr>
</tbody>
</table>
Solar connection splitter (Y-connector)

10 AWG Solar panel wire solar resistant

Solar extension cable

30 Amp Fusible Metallic AC cutoff box

1.5" aluminum sold angle 1/8"
4 per panel

Electrical insulated wire terminals crimp ring
INSTALLATION

ROOF
BEFORE BRINGING PANELS ON THE ROOF

1. Measure the distance between the purlins on the roof and mark that distance along the long side of each solar panel.

2. Brackets must be attached to panels like so:

3. Drill two holes on long side of panel using the hammer drill.

4. Line the bracket up with the holes and place a bolt in each.

5. Tighten a nut on the end of each bolt.

6. While holding the nut down with a wrench, use the driver to tighten the nut and bolt to the bracket.

7. Repeat steps 3-6 for each panel. Once done, the panels are ready to mount!

ON THE ROOF

1. Line up the panel so that the brackets sit on the ridges. Paying attention to what end the underside wires are on. You will want the panels to be placed in the same direction.

2. Drill a hole through the bracket, through the metal roof, and into the wooden purlin. *Make sure not to drill all the way through the wood.

3. Squeeze silicon sealant under the hole in the bracket. This will ensure no water gets through.

4. Place a washer onto the roofing screw and drill it tightly into the pre-drilled hole. *Do not drill so tightly that the roof compresses.

5. Repeat steps 1-4 per panel. Once done, you are ready to wire them together!
**WIRING PANELS TOGETHER**

- Each panel has 24 V
- The inverter takes 48V
- In order to transfer energy, two panels must be connected for an output of 48V
- Tuck all wiring under the panels to avoid overheating

1. Wire two panels together in series by connecting the positive end from one panel to the negative end of the other panel. This leaves two wires, one from each panel, a positive and a negative end. Repeat this per pair of panels.

2. Join together the multiple pairs of 48V in parallel using the Y-connectors.

3. Connect the last Y-connector to the solar extension cable and wire the extension through conduit until it reaches the inverter on the inside.

- Positive
- Negative
1. Screw the inverter to the wall, in close proximity to the circuit panel

2. Attach the surge suppressor to either the interior or exterior of the Emergency Cutoff box

3. Screw the Emergency Cutoff box to the wall, next to the inverter

4. Attach a surge suppressor to an outlet box and connect all three wires (red, black and green) to the outlet

5. Attach the outlet box to the circuit panel and screw to the wall below inverter

6. Cut the 10 AWG solar wire to length to connect the two outer screws on the Cutoff box to the inverter. Twist the bare wire ends to the Cutoff box screws and attach crimp rings to the side connecting to the DC inputs on the inverter. *Keep track of which wires are positive (red) and negative (black)*

7. Connect the wires extending down from the solar panels with the respective positive and negative wires from the surge suppressor on the Cutoff box

8. Attach the connected wires to their respective screws on the Cutoff box. *Connect the wires so that two positive screws are together and two negative screws are together*

9. Attach the green wire from the Cutoff surge suppressor through the bottom screw and down into the outlet box

**FINAL STEPS**

☐ Plug the inverter into the outlet box and turn on the inverter!

☐ Congratulations! You are now harvesting the sun’s energy into electricity!
From Solar Panels

DC positivo

DC negative

Wire marked with red tape goes to red connector. Wire without tape goes to black connector.

Pull emergency cutoff before turning off or disconnecting inverter.

Emergency Cutoff Box

Mark with red tape

May be located on side of exterior or on inside of box.

Surge Supressor

Attaches to exterior side of outlet box

Locations of red and black wires from surge supressor don't matter

Outlet

Ground

Plug into outlet or wi-fi data logger

To Circuit Panel
Must be on a dedicated circuit with its own 20 amp circuit breaker.

Inverter