solar gates in winter

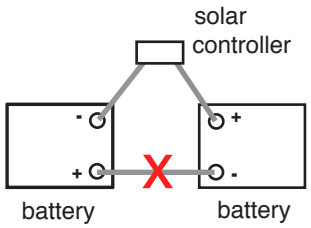
During colder months, solar gates in the southern parts of Australia may not get enough sun to fully charge batteries.

Homeowners may need to take simple steps to keep their solar powered gate working uninterrupted.

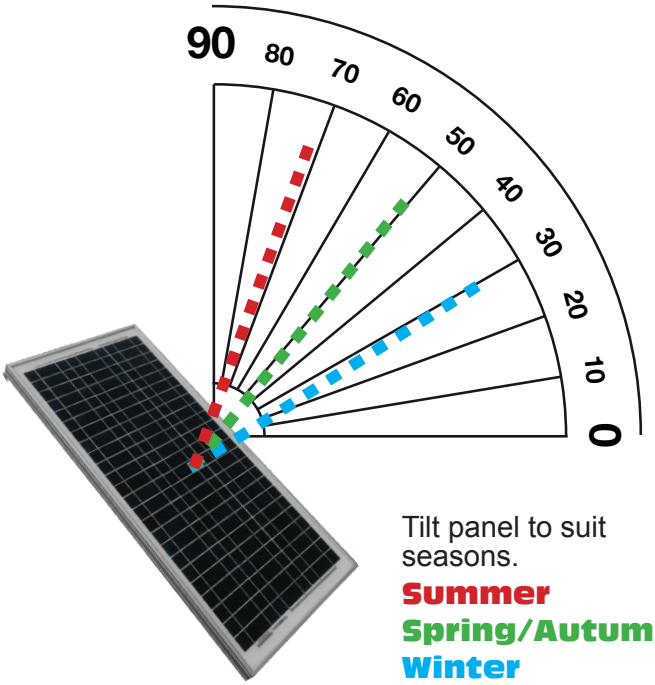
1. Adjust angle of the panel to maximise sun exposure.

2. At the start of autumn and winter, charge the batteries. This will stop batteries running flat, plus extend the life of the batteries.

Disconnect cable between batteries before charging with car battery charger.



solar angles



Tilt panel to suit seasons.

Summer

Spring/Autumn

Winter

City	Winter	Spring/ Autumn	Summer
Adelaide	32°	55°	78°
Albany	32°	55°	78°
Albury	30°	54°	78°
Alice Springs	42°	66°	90°
Armidale	36°	60°	84°
Ballarat	28°	52°	76°
Banora Point	38°	62°	86°
Bendigo	30°	53°	76°
Blacktown	32°	56°	80°
Brisbane	38°	62°	86°
Broken Hill	34°	58°	82°
Brunswick	28°	52°	76°
Buderim	40°	63°	86°
Bunbury	34°	57°	80°
Bundaberg	42°	65°	88°
Burnie	26°	49°	72°
Caboolture	40°	63°	86°
Carins	50°	73°	96°
Caloundra	40°	63°	86°
Canberra	32°	55°	78°
Canning Vale	34°	58°	82°
Carindale	38°	62°	86°
Caringbah	32°	56°	80°
Carlingford	32°	56°	80°
Castle Hill	32°	56°	80°
Cessnock	34°	57°	80°
City of Parramatta	32°	56°	80°
Coffs Harbour	36°	60°	84°
Craigieburn	28°	52°	76°
Cranbourne	28°	52°	76°
Cronulla	32°	56°	80°
Darwin	54°	78°	102°
Deception Bay	40°	63°	86°
Dee Why	32°	56°	80°
Devonport	26°	49°	72°
Dubbo	34°	58°	82°
Earlwood	32°	56°	80°
Echuca	30°	54°	78°
Engadine	32°	56°	80°

City	Winter	Spring/ Autumn	Summer
Epping	32°	56°	80°
Ferntree Gully	28°	52°	76°
Forster	34°	58°	82°
Frankston East	28°	52°	76°
Gawler	32°	55°	78°
Geelong	28°	52°	76°
Geraldton	38°	61°	84°
Gladstone	42°	66°	90°
Glenmore Park	32°	56°	80°
Gold Coast	38°	62°	86°
Gosnells	34°	58°	82°
Goulburn	32°	55°	78°
Granville	32°	56°	80°
Greensborough	28°	52°	76°
Griffith	32°	56°	80°
Hobart	24°	47°	70°
Hoppers Crossing	28°	52°	76°
Hornsby	32°	56°	80°
Jervis Bay Village	32°	55°	78°
Kalgoorlie	36°	59°	82°
Katoomba	32°	56°	80°
Kwinana	34°	58°	82°
Launceston	26°	49°	72°
Lismore	38°	61°	84°
Liverpool	32°	56°	80°
Logan City	38°	62°	86°
Mackay	46°	69°	92°
Mandurah	34°	57°	80°
Maroubra	32°	56°	80°
Marrickville	32°	56°	80°
Maryborough	40°	64°	88°
Melbourne	28°	52°	76°
Melton	28°	52°	76°
Mildura	32°	56°	80°
Mooloolaba	40°	63°	86°
Mornington	28°	52°	76°
Morphett Vale	32°	55°	78°
Mosman	32°	56°	80°
Mount Gambier	28°	52°	76°

City	Winter	Spring/ Autumn	Summer
Mount Isa	46°	69°	92°
Murray Bridge	32°	55°	78°
Nerang	38°	62°	86°
Newcastle	34°	57°	80°
North Shore	36°	59°	82°
Nowra	32°	55°	78°
Orange	34°	57°	80°
Palmerston	54°	78°	102°
Paramatta	32°	56°	80°
Perth	34°	58°	82°
Port Macquarie	36°	59°	82°
Port Stephens	34°	57°	80°
Quakers Hill	32°	56°	80°
Queanbeyan	32°	55°	78°
Rainbow Beach	40°	64°	88°
Randwick	32°	56°	80°
Rockhampton	44°	67°	90°
Roebourne	46°	69°	92°
Shepparton	30°	54°	78°
South Brisbane	38°	62°	86°
South Grafton	36°	60°	84°
Southport	38°	62°	86°
Sunbury	28°	52°	76°
Sunnybank	38°	62°	86°
Surfers Paradise	38°	62°	86°
Sydney	32°	56°	80°
Tamworth	36°	59°	82°
Taree	34°	58°	82°
Toowoomba	38°	62°	86°
Torquay	42°	65°	88°
Townsville	48°	71°	94°
Traralgon	28°	52°	76°
Wagga Wagga	32°	55°	78°
Warrnambool	28°	52°	76°
Whyalla	34°	57°	80°
Wodonga	30°	54°	78°
Wollongong	32°	56°	80°

Looking after your solar batteries in winter

Written by Michael Boxwell

Winter is a tough time for solar power: less sunshine, lower solar irradiance and shorter days mean significantly less power generated, and if you have an off-grid system, you have another issue as well - cold batteries.

Lead acid batteries quite simply don't like the cold. Optimum temperature is 25°c (77°F) and when battery temperatures drop below 15°c (59°F), the capacity of the battery decreases markedly.

At below 8°c (46°F), most batteries are providing around half of their rated capacity and at temperatures below 0°c (32°F) you risk damaging the batteries.

Batteries generate their own heat through use, so if your batteries are in use - and especially if they are fully charged - they will maintain their own temperature well above the ambient temperature.

But it helps if you can give your batteries a helping hand to make sure they are protected from the worst of the winter weather. Here are a few steps to make sure you get the best out of your solar energy system this winter:

1. Check your battery pack

As autumn turns to winter, it's time to check your battery pack and make sure that it is topped up with distilled water (if appropriate). Check the battery connections are nice and clean and the connectors are firmly fitted.

Copper grease can be used around the connectors to ward off the damp and make sure the connection is as good as possible.

Check the environment the batteries are installed in. Is it dry? Is it vented to ensure there can be no hydrogen build up?

2. Insulate your batteries

Once you've checked that your battery pack is in good condition, it is time to insulate your batteries to provide extra protection against the cold winter nights.

First of all, look at where your batteries are stored. Are the batteries standing on a concrete floor? If so, put them on a wood base - concrete floors can get very, very cold and this cold can easily transmit itself through a battery casing and into the battery itself.

Once you have done that, it's time to insulate the bottom and the side of your batteries. I use foil backed bubble-wrap which is claimed to have the same insulating properties as a 60mm layer of polystyrene (styrofoam) and has the benefit that if you ever get battery acid splashes on it, it does not disintegrate. I fold it over twice to give extra insulation.

Do not use this insulation for the top of the batteries. Firstly, this insulation conducts electricity and could short your batteries. Secondly, it is important that the batteries are allowed to vent in order to avoid hydrogen build up.

If you have your batteries inside a box, you can insulate the roof of the box. However, if you do this:

- Make sure you leave at least 2" air gap between the batteries the insulation.
- Make sure you leave venting space at the top of the roof box that is free from insulation, in order to allow hydrogen to vent from the batteries.

3. Add a thermometer

You can buy battery powered digital garden thermometers at reasonable price. These thermometers have two temperature sensors - one within the unit itself and a remote temperature sensor.

These thermometers are designed to be mounted inside with the second probe mounted outside. It allows you to compare indoor and outdoor temperatures.

Look for one that records the lowest and highest temperatures, so you can see how cold your batteries are getting without having to get up in the middle of a freezing night to check it!

These thermometers make great battery temperature monitors. Stick the second probe on to the battery pack and place the thermometer itself close to the battery pack so it can read the ambient temperature.

The thermometer will allow you to monitor the temperature of your pack on an ongoing basis. If you have insulated your batteries properly, you should always find the battery temperature is 8-10 degrees warmer than ambient temperature.

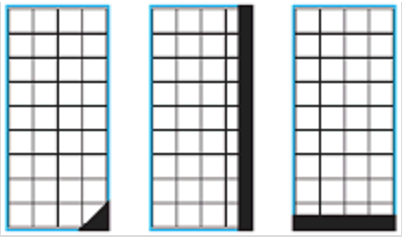
If your batteries are getting too cold, you may need to consider moving them or insulating them or protecting them in some way in order to make them warmer. Failure to do so will result in poorer performance and is the number one reason for premature failure in batteries.

SHADING

PV modules are very sensitive to shading. Unlike a solar thermal panel which can tolerate some shading, many brands of PV modules cannot even be shaded by the branch of a leafless tree.

Shading obstructions can be defined as soft or hard sources. If a tree branch, roof vent, chimney or other item is shading from a distance, the shadow is diffuse or dispersed. These soft sources significantly reduce the amount of light reaching the cell(s) of a module. Hard sources are defined as those that stop light from reaching the cell(s), such as a blanket, tree branch, bird dropping, or the like, sitting directly on top of the glass. If even one full cell is hard shaded
the voltage of that module will drop to half of its unshaded value in order to protect itself. If enough cells are hard shaded, the module will not convert any energy and
will, in fact, become a tiny drain of energy on the entire system.

Partial-shading even one cell of a 36-cell module will reduce its power output. Because all cells are connected in a series string, the weakest cell will bring the others down to its reduced power level. Therefore, whether ½ of one cell is shaded, or ½ a row of cells is shaded as shown above, the power decrease will be the same and proportional to the percentage of area shaded, in this case 50%.



Examples of partial cell shading that will reduce a solar electric panel's power by 50%.