

New Zealand
INSTALLATION GUIDE
UNIGIZER™ SOLAR SYSTEM / SOLAR KIT
 with 1, 2 or 3 J Unigizer™ and 20, 30 or 40 W solar panel



Contents

Before you start 1
Components included in the system/kit..... 1
Tools you will need 2
Selecting a location for the installation 2
Preparing the mounting post 2
Marking the post with 'true north' 2
Mounting the solar panel to the post..... 3
Setting the solar panel orientation 4
Setting the solar panel tilt angle..... 4
Preparing the energizer..... 5
Using the solar system/solar kit 6
Spare parts..... 6

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Before you start

These instructions are for two solar products, the Unigizer™ Solar System and the Unigizer™ Solar Kit. Installation of the components will take around 15 minutes and requires only one person.

Note: Ensure you have all the equipment required before beginning the installation.

Unigizer™ Solar System = Energizer, battery and solar panel/bits/mounting
 Unigizer™ Solar Kit = Solar panel/bits/mounting.

If you purchased a solar system, the Unigizer™ is included.

If you purchased a solar kit, you will need to supply a Unigizer™.

Components included in the system/kit

Unigizer™ Solar System:

- a 1, 2 or 3 J Unigizer™ mains/battery energizer
- a 20, 30 or 40 W solar panel and mounting bracket
- an accessories and spares bag (mounting screws, spare fuses etc.)
- an inclinometer (angle finder)
- a battery
- a battery box

Unigizer™ Solar Kit (does not contain an energizer):

- a 20, 30 or 40 W solar panel and mounting bracket
- an accessories and spares bag (mounting screws, spare fuses etc.)
- an inclinometer (angle finder)
- a battery
- a battery box



Tools you will need

In addition to the components provided in the system/kit, you will also need:

- a compass
- a small hammer
- a 13 mm spanner
- a 10 mm spanner or a 10 mm nut driver
- a marker pen



Selecting a location for the installation

The solar panel should be set to face north. It is critically important for the solar panel to be installed in a location where NO objects will cast a shadow on it. In winter the sun sits very low on the horizon and shadows cast by distant objects can become an issue. Even partial shading from tree branches etc. will produce a significant reduction in available output current and the batteries may not receive sufficient charge.

Preparing the mounting post

The Unigizer™ solar panel bracket is best suited for mounting onto a wooden fence post. A standard 1.2 m high, 130 mm diameter (type 1) fence post with a flat top is ideal. If a new fence post is to be installed, it must be planted firmly in the ground so that it does not shift in a storm. Use concrete or a professional post rammer to ensure that the post is stable.

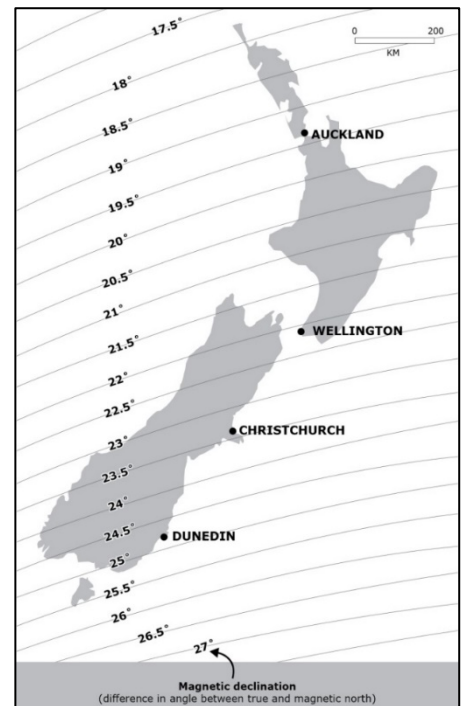


Marking the post with 'true north'

The highest amount of energy can be extracted from the sun if the solar panel is set to face 'true north'. A compass points to 'magnetic north'. The difference between the two is called the 'magnetic declination'.

The map opposite indicates the magnetic declination. For example, Auckland's magnetic declination value is 19.4 °.

Place a compass on top of the mounting post and align the red needle pointer to match the correct declination value for your location. True north is now indicated by N on the compass. Use a marker pen to mark an arrow on top of the wooden post indicating north, as shown.



Note: Keep all metal objects and electronic devices away from the compass at all times or the compass may not function correctly.

Mounting the solar panel to the post

The solar panel mounting bracket comes fitted to the solar panel. The easiest way to mount the solar panel on a fence post is to separate the base of the mounting bracket from the rest of the assembly, fix the base to the fence post, then fit the solar panel back onto the base.

Separating the base of the mounting bracket from the rest of the assembly

- 1 Use a 13 mm spanner to undo the central screw on the mounting bracket.
- 2 Remove the central screw and set it aside as it will be used later.



Fixing the base of the mounting bracket to the fence post

- 1 Find four 6 mm x 75 mm coach screws, provided in the accessories bag. These are for fixing the base of the mounting bracket to the fence post.
- 2 Place the base on the post. If the post is small, the base can be positioned in the centre, but if the post is large, position the base closer to the north edge to allow a greater angle adjustment.
- 3 Use a hammer to locate the coach screw in the first hole.
- 4 Tighten the coach screws down using the 10 mm spanner or nut driver, but not fully.

1



2



3



4



- 5 Locate and drive the three remaining screws using the above method.
- 6 Drive all four screws down fully.

Fitting the solar panel onto the base of the mounting bracket assembly

- 1 Lower the solar panel and mounting plate down onto the base. Line up the hole in the top part of the bracket with the hole in the lower part of the bracket which is fixed to the post.
- 2 Insert the central screw into the hole (this is the central screw which you set aside earlier).
- 3 Using the 13 mm spanner, tighten the central screw just enough so that the solar panel is secure. You will set the final orientation and tilt angle of the solar panel in the following steps.



Setting the solar panel orientation

The solar panel must be set to face true north.

- 1 Rotate the solar panel on the base until the face of the solar panel is facing true north as shown by the arrow you marked earlier.
- 2 Using the 13 mm spanner, tighten the central screw to lock the panel in position.



Setting the solar panel tilt angle

The solar panel must be tilted to maximise the solar energy that can be collected during the difficult winter months. The ideal tilt angle will vary depending on the location of the installation site.

As a general rule, the solar panel tilt angle in winter should be set at 'the angle of latitude for the site' PLUS 15 °.

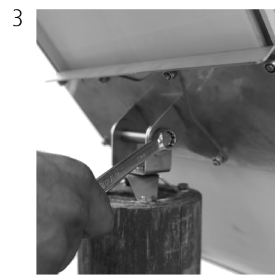
The table opposite shows the latitude and tilt angle for the main centres:

To set the solar panel tilt angle:

- 1 Place the inclinometer (angle finder) on the face of the solar panel as shown.
- 2 Using the table opposite, note the main centre closest to your location and tilt the solar panel to the appropriate angle. For example, tilt the solar panel to 52 ° if you are near Auckland.
- 3 Use the 13 mm spanner to loosen the tilt angle screw. Adjust the angle of the solar panel and lightly tighten the nut. Double-check the angle setting, then firmly tighten the nut. Check that the solar panel cannot move at all. If there is any movement then readjust and tighten.

Tilt angles for main centres

Location	Latitude	Tilt angle
Whangarei	36 °	51 °
Auckland	37 °	52 °
Wellington	41 °	56 °
Christchurch	42 °	57 °
Dunedin	45 °	60 °
Invercargill	46 °	61 °



Preparing the energizer

Familiarising yourself with the Unigizer™ mains/battery energizer (supplied with Unigizer™ Solar Systems only)

Open the box and check the contents. There should be:

- a 1, 2 or 3 J Unigizer™ mains/battery energizer
- a user guide
- a battery connection lead set
- a fence connection lead set
- a mains power supply.



Note: When using the Unigizer™ mains/battery energizer provided as part of this solar system or with the solar kit that you have purchased, you will not require the mains power adaptor provided. Retain it for possible use in the future.

Preparing the battery connection lead set

- 1 For a permanent solar installation, the standard battery lead set must have the crocodile clips removed before it can be connected to the battery.
- 2 Carefully pull the leads in order to separate them from the crocodile clips.



Caution: Be careful not to damage the wires.

Connecting the solar panel and battery

Connect the solar panel's battery leads and the energizer's battery leads to the battery:

Positive solar panel and battery leads (+ Red) connect to the positive battery terminal (+ Red)

Negative solar panel and battery leads (- Black) connect to the negative battery terminal (- Black)

Note: If the solar panel is connected incorrectly, the solar panel's safety fuse will blow and will need to be replaced. The replacement fuse must be a 2 A, 5 x 20 mm, glass quick blow fuse. The safety fuse is located in the terminal box which is on the back of the solar panel. See *Protection fuse replacement* on page 6.



Installing the energizer

- 1 Mount the energizer and connect it to the fence as described in the energizer's user guide.
- 2 Connect the other end of the energizer's battery leads to the energizer.

Using the solar system/solar kit

Solar panel charging and trouble shooting

The solar panel features a built-in electronic battery charging module designed to maximise the battery charge power by using "maximum power point tracking" technology. The module also maintains full control over the charging of the battery, with automatic switching between "boost" and "float" charging rates to ensure the battery is maintained in peak condition at all times.

The solar charging system is completely automatic and requires no maintenance, however it is important to be aware of the following details:

Charging control

In good sunlight the solar panel will "boost" charge the battery. If the battery voltage rises to 14.5 V, the battery is fully charged, and the charging module will reduce the charge voltage to a maintenance "float" voltage of 13.5 V. If the battery voltage drops down below 13.2 V, the "boost" cycle will restart.

Over-current protection

The charging module is fully protected against over-current when the output leads are connected together or if a flat battery is connected.

Bad battery protection

If the charging module detects that a totally discharged battery (below 10 V) has been connected, it will only be charged at a low trickle charge rate (0.15 A). This will continue until the battery voltage rises to within normal limits and then it will automatically switch over to a boost charge rate.

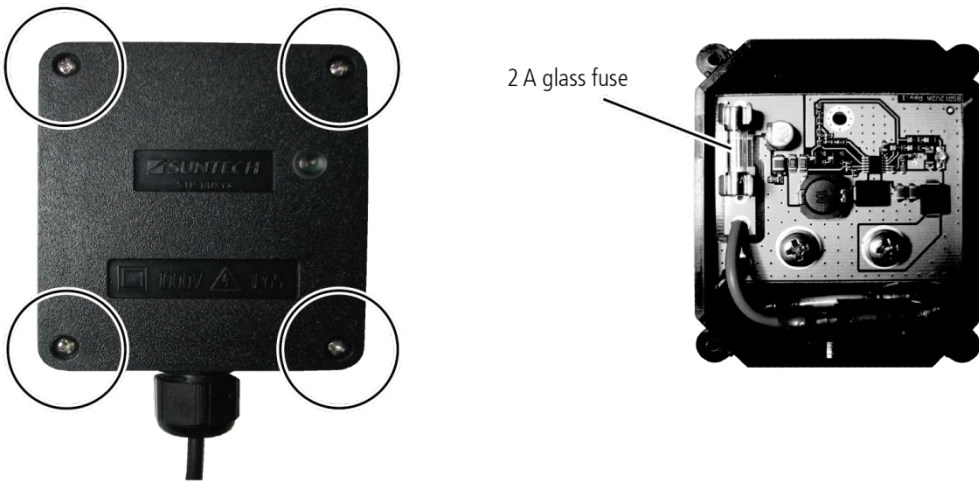
Note: The solar panel output voltage should only be measured when a 12 V battery is connected.

Reverse battery protection

In the rare situation that the 12 V battery is connected in reverse, the safety protection fuse on the charging module will blow to prevent damage. This 2 A glass fuse must be replaced before the Solar System can be used.

Protection fuse replacement

Undo the four No.1 Philips screws securing the lid of the terminal box. Remove the screws and the lid. Locate, remove and then replace the 2 A fuse. A spare fuse is provided with the kit, however 2 A glass fuses (20 mm x 5 mm) are readily available from any good electronics store. Refit the lid and tighten the screws sufficiently to ensure the lid is secure. Over-tightening the screws will over-stress the plastic lid, but will not improve the water seal.



Spare parts

Some components are available as spare parts.

Note: Contact your local Datamars representative for information about spare parts.

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