heliomotion

How does Heliomotion track the sun?
The tracker has an integrated GPS module used to determine the time, latitude and longitude. Using that information it calculates the sun's position in the sky in order to follow it.

How much does tracking increase electricity production?
Solar tracking increases energy yield by 30-60% per year, occasionally more, depending on location, compared with a stationary panel facing south with an ideal tilt. The energy increase depends on the latitude where the installation is located, from +25% at the northern equinox to +60% in Scandinavia. The extra energy is generated in the morning and in the evening which matches the consumption curve of a typical household much more efficiently than a static system which peaks at solar noon – often when everyone is out of the house.

How is the Heliomotion solar tracker powered?
It can be powered from any constant 24 VDC power source, either using the included 24 VDC power adapter or by connecting it to a 24 V battery bank. The input voltage range is 24 VDC ± 20%.

How much wind load is the Heliomotion designed to handle?
The tracker and solar panels are engineered to withstand high wind loads and survive wind speeds up to 30 metres per second – equivalent to 67 miles per hour. Should you expect winds in excess of this, it is recommended that you use the provided extension rod to tilt the panels horizontally. This will protect the installation until the storm passes, as this is the optimum position for the installation to resist high wind loads.

At what temperature do solar panels function best?
25°C (77°F) temperature indicates the peak of the optimum temperature range for solar panels. It is when solar photovoltaic cells are able to absorb sunlight with maximum efficiency and when they can be expected to simply work their best.

How long is the design life and warranty of the product?
The Heliomotion tracker is designed to last for as long as the panels last, typically 25-40 years. We give a 3 year warranty to provide free replacement parts. The warranty appears on the last page of the manual.

The panels have a 10 year guarantee on materials and workmanship, and a 95% output guarantee for the first 5 years and 87% up to 25 years thereafter.

How far away can a Heliomotion power plant be placed?
We recommend the power plant is placed within 100 meters of where the power will be used. The cable size can be adjusted to keep transmission losses low between the power plant and the inverter/charger. Transmission losses are proportional to the ampere so to keep losses low the voltage is kept high. The PV-1300 system runs at 220 VDC and up to 6 ampere. Using for example 4mm2 wires the losses will be at most 2% at 40 meters, or 4% at 80 meters. Doubling the cross-sectional area of the wire will halve the losses.

Should I choose a grid-tied or a battery-tied system?
Our recommendation is to use the grid-tied system if utility power is available, and to use the battery-tied system for off-grid installations without access to utility power. The main reason for this is that the grid-tied system is simpler to install and allows you to automatically utilise 100% of your produced electricity. Furthermore, the grid tied system is cheaper.

What does the solar station do?
A solar station combines a solar battery charger with an inverter and a utility power relay. It can be used with or without utility power, and works even if the power is out. The station automatically switches to utility power when solar and battery power is insufficient/there is an outage. The power from the station is not supplied to the grid, but used locally, via a new electrical outlet or connected to existing outlets via the building's fuse box. When the batteries are full any surplus solar power not consumed will be discarded.

How much battery capacity should I have for an off-grid system?
For off-grid cottages, a 5 kWh battery bank (4 x 12V 110Ah) is the recommended minimum when used together with a PV-650, or 10 kWh when used together with a PV-1300. This allows you to store one full day's solar energy production for use during nights and cloudy days. Additional battery capacity allows for a greater buffer during rainy days.

Which battery type should I use?
We recommend deep cycle gel batteries for solar battery systems. They are maintenance free, can be used indoors, have a long design life, and are made to withstand deep discharge cycles. Deep Cycle Gel batteries generally have better cycle capacity and longer service life than deep cycle AGM batteries, both under float and cycling conditions.

If my batteries are full, and my panels are working well, what happens to the surplus electricity they are generating?
It will be discarded.

How much space does a system take up?
The turning circle for a single PV-2 is 3 metres, the PV-4 is 4 metres. Depending on the time of year, and the adjustment of the tilt, it will rotate up to 180 degrees and the lower edge of the panels will be approximately a metre off the ground, so you are looking at around a total height of about four metres. The turning circle required for a single PV-6 is 5 metres. The panels each measure 1558 high x 1046 cms wide. The dimensions of the six panels together are 3140 high x 3120 cms wide. The support column is about 2 metres high. A finished system is 3.3 metres from the top to the ground.

Is it possible to fit solar thermal collectors on the tracker?
Yes. In addition to the PV-series we provide the TC-1000 and TC-2000 (TC for thermal collector), which include the tracker as well as the thermal collector. To this we also add the complete pump system including everything you need: the circulation pump, air vent, pressure relief valve, refill valve, pressure gauges, temperature sensor, flow sensor, pump regulator (Resol CS Plus) and expansion vessel. The tracker comes with an integrated safety feature for the thermal collector: if the temperature in the heat transfer liquid exceeds a set value (for example if nobody is tapping any warm water and the whole system keeps getting hotter) the tracker will turn away from the sun to prevent the collector from overheating. After the system has cooled down sufficiently the tracker will return to the position where it is programmed to be at that time.

When purchasing the product does one need to buy the inverter separately?
When you buy a Heliomotion you have the choice to buy just the unit itself (tracker, framework and panels) or to buy the complete package including inverter, cables, breaker box etc. We sell packages for on grid installations as well as off grid installations complete with batteries and

charger/inverter solar stations. We also sell Heliomotions equipped with thermal solar collectors, complete with pumping stations, regulators and controllers. Some customers prefer to use inverters and other equipment from other suppliers, but in most cases our customers prefer to buy the complete packages from us, knowing that we have selected and optimised all components to match together. On our product page we show different options and packages. For our export sales, we expect that most resellers/customers will buy the panels and inverters locally and just buy the tracker with framework from us. You can install a Heliomotion at quite a long distance from the inverter; using our 4×2.5mm2 cable, you will have only minimal losses up to 100 meters distance. At longer distances, we recommend an increase in the cable diameter. We advise against installing a Heliomotion on the roof – one of the advantages of a Heliomotion is that it is easily installed and serviceable on the ground.

What exactly is a kilowatt hour?
A kilowatt hour (kWh) is a measure of how much energy you're using. It doesn't mean the number of kilowatts you're using per hour. It is simply a unit of measurement that equals the amount of energy you would use if you kept a 1,000 watt appliance running for an hour:- if you switched on a 100 watt light bulb, it would take 10 hours to rack up 1 kWh of energy. Or a 2,000 watt appliance would use 1 kWh in just half an hour. While a 50 watt item could stay on for 20 hours before it used 1 kWh.

What else takes around 1 kilowatt hour?
It's hard to be precise, because the similar appliances can have very different wattages, but here are some rough examples of 1 kWh:

- Using a 10,000 watt electric shower for six minutes
- Keeping an immersion heater (3,000 watts) on for 20 minutes
- Cooking in a 2,000 watt oven for half an hour
- An hour's ironing with a 1,000 watt iron or 45 minutes with a 1,500 watt iron
- Less than an hour using a dishwasher (1,000 - 1,500 watts)
- Around three hours watching a plasma TV (280 - 450 watts)
- Keeping a fridge-freezer (200 - 400 watts) on for about three hours
- Keeping an electric blanket (130 - 200 watts) on all night
- Using a laptop (20 - 50 watts) all day
- Keeping a broadband router (7 - 10 watts) on for five days

What's the difference between kWh and kW?
kW stands for kilowatt. A kilowatt is simply 1,000 watts, which is a measure of power. So, for example, the 10,000 watt electric shower in the top bullet point above could also be called a 10 kilowatt shower. A kilowatt hour (kWh) is a measure of energy.
A 1,000 watt drill needs 1,000 watts (1 kW) of power to make it work, and uses 1 kWh of energy in an hour. That's why, if you leave a TV or computer on standby, it is still using power and creating a kWh cost on your energy bill.

How many kilowatt hours should I be using each year?
That depends on the size of your home, the number of people in your family, and whether you spend a lot of time out at work, or most of your time at home. According to energy industry figures:

- If you live alone in a small home and are out at work full time, you might use 2,000 kWh of electricity a year and 9,000 kWh of gas
- A small family who live in a three-bedroom house and are in full-time work and education might use 3,200 kWh of electricity and 13,500 kWh of gas
- Four or five students sitting around all day in a large four bedroom house could rack up about 4,900 kWh of electricity and 19,000 kWh of gas.