User Manual

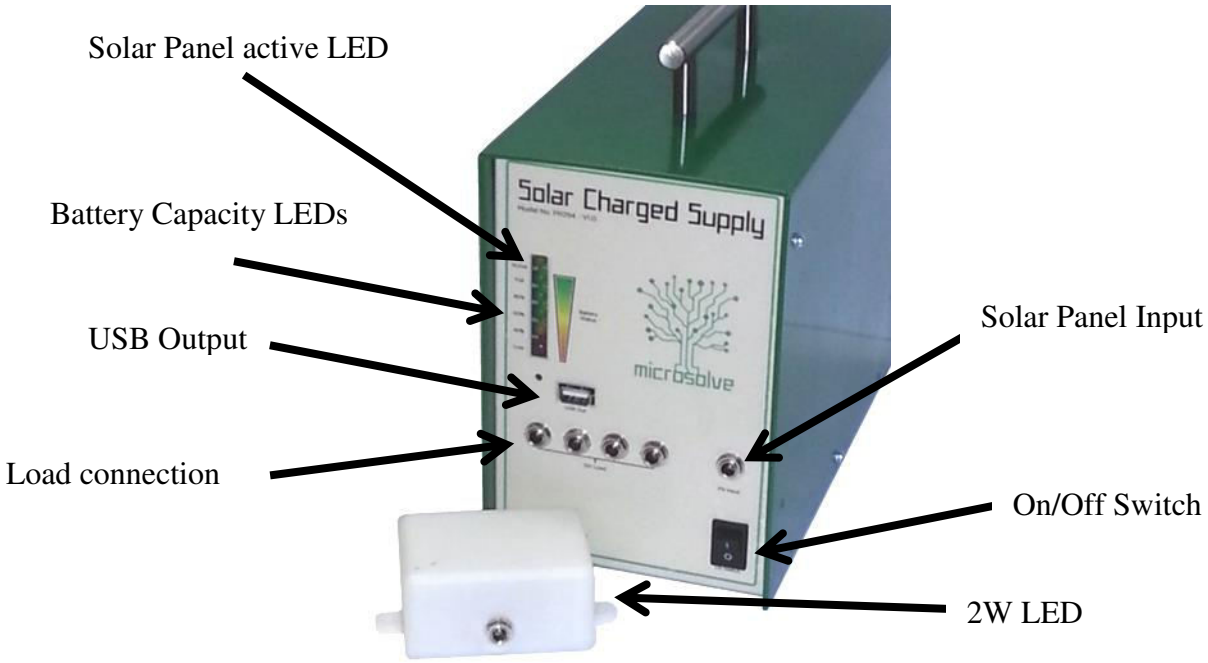
Solar Charged Supply PR294

Renewable energy series - ***Light and power from the sun***

By Microsolve C.C.

Revision 1.00

Components



Components supplied in the kit

1 off Solar Panel with 3m prewired cable
2 off 2W LED light
2 off 3m cable with inline switch and 2.5mm plug

Introduction

Thank you for purchasing our product. You have become a proud owner of a sustainable renewable energy source, charged by the sun. The unit uses sunlight to generate electricity in a Solar Panel, when you may not necessarily need the power, to charge a lead acid battery so that you have power when you need it.

The unit has been manufactured with the latest electronic components available, and uses a microprocessor with an intelligent algorithm to charge and discharge the battery for many cycles service. The unit will give you many years of trouble free operation, provided that you follow the instructions in this manual.

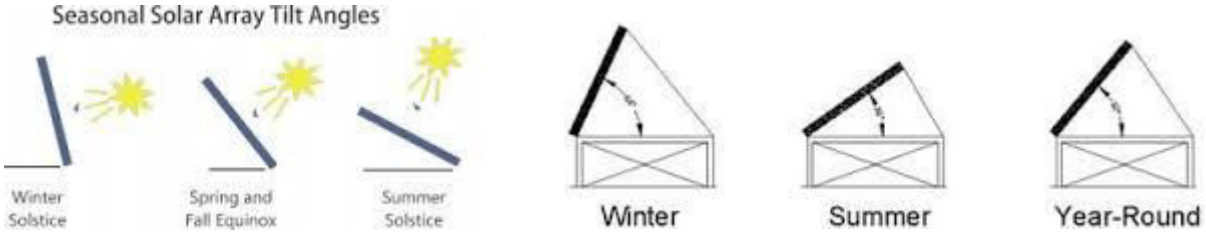
Operation

The unit has 3 major components, namely a solar panel, which is the main source of energy, the lead acid battery, which stores the energy, and the electronics which controls the charging and discharging process to ensure maximum efficiency both from the panel and battery lifespan.

Solar Panel (PV)

Ensure that the On/Off switch is in the 'On' position in order to charge the battery. In the case the battery is over discharged, the Buzzer will emit a sound every few seconds, until the battery voltage reaches a minimum point of charge, then the sound will stop. In this case remove all loads, so that the PV panel can supply as much energy to the battery as possible, in order that the battery can recover the energy from the PV panel.

For best results, the PV panel must be placed in direct sunlight, and at no time must there be any shadows cast on the PV panel. These shadows reduce the amount of energy the PV panel produces. Always ensure that the PV panel is perpendicular to the sun light, as this is the time that the PV panel will produce the maximum amount of energy captured from the sun. There is a difference in the amount of energy that the PV panel can harness during summer and winter days. The panel collects more energy on summer days than it does on winter days. The amount of time that the sun is shining on the PV panel also varies from summer to winter. In the case that the panel is left alone to charge the battery, or in the case that the PV panel is mounted permanently, then a compromise in the PV position must be made. A typical site is shown in the following diagrams. By doing a visual inspection at midday in summer and winter, selecting the average position between summer and winter solstice will be a good position to place the panels for an all year round position. It must be noted, that there is between 5 and 6 hours of useable sunlight on a daily basis, and if there are clouds in the sky, then the amount of available sunlight will be reduced. This in turn will provide less energy to the battery charging process.



When selecting a permanent position for the PV panel, ensure that the panel will be in the path of the sun, both in winter and summer, and that there is little or no possibility of shadows being cast onto the PV panel from obstructions. Also ensure that there is easy access to the PV panel, as it will require periodic cleaning of the glass due to dust or bird droppings. If the area in which the PV panels are installed, is very dry and dusty, then the possibility of dust covering the panel increases, and periodic cleaning of the surface will ensure a good transfer of energy to the battery charger. In the case bird droppings are noted on the PV panel, it must be cleaned, or the performance of the panel will be affected. Using water and a cloth should suffice to clear the dust or bird droppings.

The PV panel comes prewired with a 3 meter wire and 2.5mm plug. Insert this plug into the Solar Charged Supply socket market PV Input.

External Charger other than PV Panel

The unit may be charged from a wall power supply, but it is imperative that the supply be a constant current supply, to match the battery capacity, with an open circuit voltage no higher

than 24V DC. This charger must not be permanently connected to the unit, and should not be allowed to be connected for more than 12 hours to the unit via the PV input for any charge cycle, as it will cause damage to the battery by virtue to over charging of the battery.

Loads can be connected to the unit while being charged, but bear in mind, that the battery will not fully charge in the period that the PV panel is in the sun, and may cause shorter periods of load connection to the battery, simply because the connected load has re-routed the charge from the PV panel to the connected load.

Important

When using the unit for the first time, whilst the battery may indicate a charge, the battery may not have the full amount of energy, as the batteries are only partially charged from the factory, and batteries do self discharge over a period of time when not used. We recommend that the unit is charged fully using the supplied PV panel or external charger, to get the maximum amount of power from the internal battery. Do not use any other PV Panel off different rating as the panel supplied with the unit, to avoid damaging the internal battery due to over current. The PV panel has been matched to the internal battery capacity, and using a higher rated panel may cause excessive currents to be supplied to the battery by damaging the battery and reducing the battery lifespan.

See the label on the rear panel of your unit to see the battery capacity, and refer to the chart below which states the panel capacity with respect to the battery capacity size.

Load Connection

The unit has 4 sockets to connect external 12V loads. The unit will be able to supply 5Amps of current at 12V for the duration of the battery capacity across all the outputs. The unit will be able to supply for short durations peak currents of 10Amps, however continuation of this high current, will trigger an electronic fuse, which will shut down the battery. To reset the fuse, switch the power off, remove all loads connected to the unit, wait a few seconds and switch the power switch on again. If the electronic fuse has recovered, then the unit will beep and the battery capacity meter will indicate the battery capacity. Reconnect the loads.

Do remember, that the duration of available power is directly proportional to the amount of energy drawn from the battery. The higher the load wattage, the less time the battery will be able to supply the load, before it requires a recharge.

USB Output

The USB port will supply 1Amp at 5V for use to charge your phone, or other USB device.

Battery Indicator LEDs

There is a bar scale which is used to indicate the battery capacity, and is more of an indication to the amount of energy the battery may have. When the battery reaches 11V, only the ‘Low’ red LED will light, and the audible alarm will trigger every few seconds, to indicate that the battery has very little energy left, and that you may have a very short time of energy left.

If you continue to drain the battery, and the battery voltage drops below the 10.5V level, the unit well disconnect all the loads, and the audible alarm will double beep continuously, until either the On/Off switch is switched off, or alternatively, the battery is charged via the PV input and rises above 11V.

In the case that the unit is allowed to discharge beyond the 10.5V, the output will remain disconnected, until the battery voltage reaches 12V. This can only be dome by recharging.

During the charging process, the fact that the green 'Full' might come on, does not necessarily mean that the battery is fully charged. Always leave the PV Panel connected to the unit, until the PV Input light extinguishes.

In the case that you are using a wall charger, allow the charger to be connected for a period of 12 hours for a full charge.

Specifications:

4 models available :-
7.2Amp internal battery with a 10Watt Solar panel, recommended charge current 600mA
9Amp internal battery with a 20Watt Solar panel, recommended charge current 750mA
12Amp internal battery with a 20Watt solar panel, recommended charge current 1Amp
20Amp internal battery with a 30-35Watt solar panel, recommended charge current 1.7Amp

USB output	5V at 1Amp
Combined 12V DC output	5Amps – Internal electronic Fuse protected
Short circuit	10Amps internal electronic Fuse protected
Maximum PV input Voltage	25V
PV fully loaded MPPT	17-18V
PV Maximum current	1.4Amps, 2.4Amps on model with 35W PV.

2Watt LED
10 to 30V DC operation – polarity protected
240 Lumens to comfortably light up a 3 m by 3 m room
Will draw 2 watts irrespective of voltage and maintain constant light intensity
3 meter wire with switch and plugs to match standard
Durable diffuser enclosure
Light weight, screw or glue mount

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Notes