



# PP1 & SP1 Power Pack 1 & Solar Panel 1

*User Manual*  
mantracourt.com

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## Introduction / Overview

The Power Pack (PP1) & Solar Panel 1 (SP1) provides dependable off-grid power generation to support a variety of Mantracourt products.

Packaged in an IP67 sealed case with rugged waterproof connectors the PP1 has two sources of charge for the internal battery with both solar and mains power input charging. The case also features Stainless steel padlock protectors for easily securing your supply on site.

The PP1 has a single 12 Volt fuse protected output. The mating connector comes pre-fitted with 5 metres of cable and bare end connections.

The solar panel features hail-proof tempered glass and closely packed polycrystalline cells, sealed into a robust aluminium frame. The junction box on the rear of the panel does not protrude beyond the frame, so installation can be simple and neat. The solar cell comes with 5 metres of cable as standard longer lengths are available on request.

The SP1 & PP1 combined are designed to provide a perpetual power supply for a 12 V system drawing an average of 53mA, even during winter.

The PP1 can also be used as a mains powered 12V DC supply with 33Ahr battery back up.

## Dimensions & Weight

|                    |                    |
|--------------------|--------------------|
| PP1 Dimensions     | 339 x 295 x 152 mm |
| PP1 Case materials | Polypropylene      |
| PP1 Weight         | 13 Kg              |
| SP1 Dimensions     | 360 x 510 x 28 mm  |
| SP1 Frame Material | Aluminium          |
| SP1 Weight         | 3 Kg               |



## Getting Started

It is important when using the PP1 in any configuration that the connections are made in the following order:

1. Connect the 12V output lead to the device you wish to supply. The PP1 is provided with a 5 metre 12V output cable, this cable has the IP67 connector which mates with connection 3, see below. The cable is bare end terminated the red wire is positive and black is ground. Ensure the bare end connections are made before attaching to the PP1.
2. Connect the Solar Panel. The solar panel is supplied with a 5 cable terminated with the IP67 connector which mates with connection 1, see below.
3. Connect 100-240V supply (if necessary) The PP1 is supplied with a 0.8 m mains cable with a 13 amp plug. The battery inside the PP1 will be supplied fully charged.

## Power Pack 1 Connections



1. Solar Panel Input
2. 100 - 240 Volt AC input
3. 12Volt DC Output
4. 6.3 Amp Anti-surge Fuse

## Installation

### Connecting Power Pack 1

All connectors on the SP1 and PP1 are IP67 rated when mated. The PP1 case is also IP67 rated meaning it is protected against the effects of temporary immersion in water between 15cm and 1m for no longer than 30 minutes. Dust caps must be fitted properly if the connection is not being used. If possible avoid positioning the PP1 in direct sunlight to limit temperature effects on the battery.

The connections for the solar panel input and 12 Volt output feature a locking collar to ensure the connection is sealed. To insert remove the dust cap and align the connector and insert; there is a locating ridge to ensure correct orientation. Once inserted twist the collar clockwise to lock in place. The connectors for the solar panel and 12 volt output are opposite gender preventing incorrect connections.



The PP1 110 - 240Volt AC input has a sealing cap for when it is not connected to the mains. The sealing cap is removed by pushing the outer sleeve towards the case and pulling the cap out.



To insert the mains cable input simply align the two parts using the locating grooves on the connector and push in until the outer sleeve locks; to remove again repeat the same procedure as to remove the sealing cap.

### ***Solar Panel Orientation***

The SP1 is supplied on a mounting plate which when assembled with the horizontal support holds the panel at an optimal 50 degrees. The bracket is designed to be mounted on a pole or directly onto a wall.



When positioning the solar panel it should always face true south if you are in the northern hemisphere, or true north if you are in the southern hemisphere. True north is not the same as magnetic north. If you are using a compass to orient your panels, you need to correct for the difference, which varies with location. Search the web for "magnetic declination" to find the correction for your location.

Also consider where shadows may fall on the solar panel, the panel needs maximum exposure to the sun to operate as specified.

### ***Operation***

The PP1 and SP1 combination was designed to supply a 12 Volt system with a maximum continuous average current consumption of 53mA. The power rating of the system would be 0.636W; if used 24 hours per day this would equate to 15.264 Watt-hours. On an average British day, this power could be produced by a solar panel array of approximately 6 watts. However, you do of course get more power in the middle of summer than in winter. In summer you could produce that power required with only 3 watts of solar panels. In winter you would need 15 watts of panels to produce enough power. Hence the SP1 20W panel is more than adequate.

The output from the PP1 is fuse protected by a 6.3 Amp anti surge fuse, this is to protect against short circuit on the output, fuses are 6.3A 20x5mm ceramic glass tube type. The 100-240V AC input charger is fuse protected in the 13Amp plug, if this plug is replaced with any other connector please consider how your PP1 is protected.

## Specifications

| Electrical                    | Min | Typical | Max | Units    |
|-------------------------------|-----|---------|-----|----------|
| Output Voltage                |     | 12      |     | V DC     |
| Internal Capacity             |     | 33      |     | AHr      |
| External Power Supply Voltage | 100 | -       | 250 | Volts AC |
| Input Frequency               | 47  | -       | 63  | Hz       |

| Cable Lengths                 |  |     |  |   |
|-------------------------------|--|-----|--|---|
| 12 V Output Cable to Bare End |  | 5   |  | m |
| Solar Panel to Power Pack     |  | 5   |  | m |
| Mains Charging cable *        |  | 0.8 |  | m |

\* Supplied with 13 Amp Plug

| Environmental                  |     |      |     |     |
|--------------------------------|-----|------|-----|-----|
| IP rating                      |     | IP67 |     |     |
| Operating temperature range ** | -20 |      | +50 | C   |
| Storage temperature            | -20 |      | +50 | C   |
| Humidity                       | 0   |      | 95  | %RH |

\*\* When being charged from Mains min operating temperature 0 °C max operating temperature if 40 °C

## Warranty

The PP1 & SP1 is warranted against defective material and workmanship for a period of (1) one year from the date of dispatch.

If the MANTRACOURT ELECTRONICS LTD' product you purchase appears to have a defect in material or workmanship or fails during normal use within the period, please contact your Distributor, who will assist you in resolving the problem. If it is necessary to return the product to 'MANTRACOURT ELECTRONICS LTD' please include a note stating name, company, address, phone number and a detailed description of the problem. Also, please indicate if it is a warranty repair.

The sender is responsible for shipping charges, freight insurance and proper packaging to prevent breakage in transit.

'MANTRACOURT ELECTRONICS LTD' warranty does not apply to defects resulting from action of the buyer such as mishandling, improper interfacing, operation outside of design limits, improper repair or unauthorised modification. No other warranties are expressed or implied. 'MANTRACOURT ELECTRONICS LTD' specifically disclaims any implied warranties of merchantability or fitness for a specific purpose. The remedies outlined above are the buyer's only remedies. 'MANTRACOURT ELECTRONICS LTD' will not be liable for direct, indirect, special, incidental or consequential damages whether based on the contract, tort or other legal theory.

Any corrective maintenance required after the warranty period should be performed by 'Mantracourt Electronics Ltd' approved personnel only.



In the interests of continued product development, Mantracourt Electronics Limited reserves the right to alter product specifications without prior notice.

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