

# ***PowerTop V3 User Operation Manual***



*This manual must be read in its entirety before operating the PowerTop and retained for future reference.*

# **IMPORTANT SAFETY INSTRUCTIONS**

## **BEFORE USING THIS APPLIANCE READ ALL SAFETY AND USAGE INSTRUCTIONS LOCATED ON THE APPLIANCE AND IN THIS MANUAL**

**These warnings apply to the appliance, and also where applicable, to all tools, accessories, chargers or mains adapters.**

### **TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK OR INJURY**

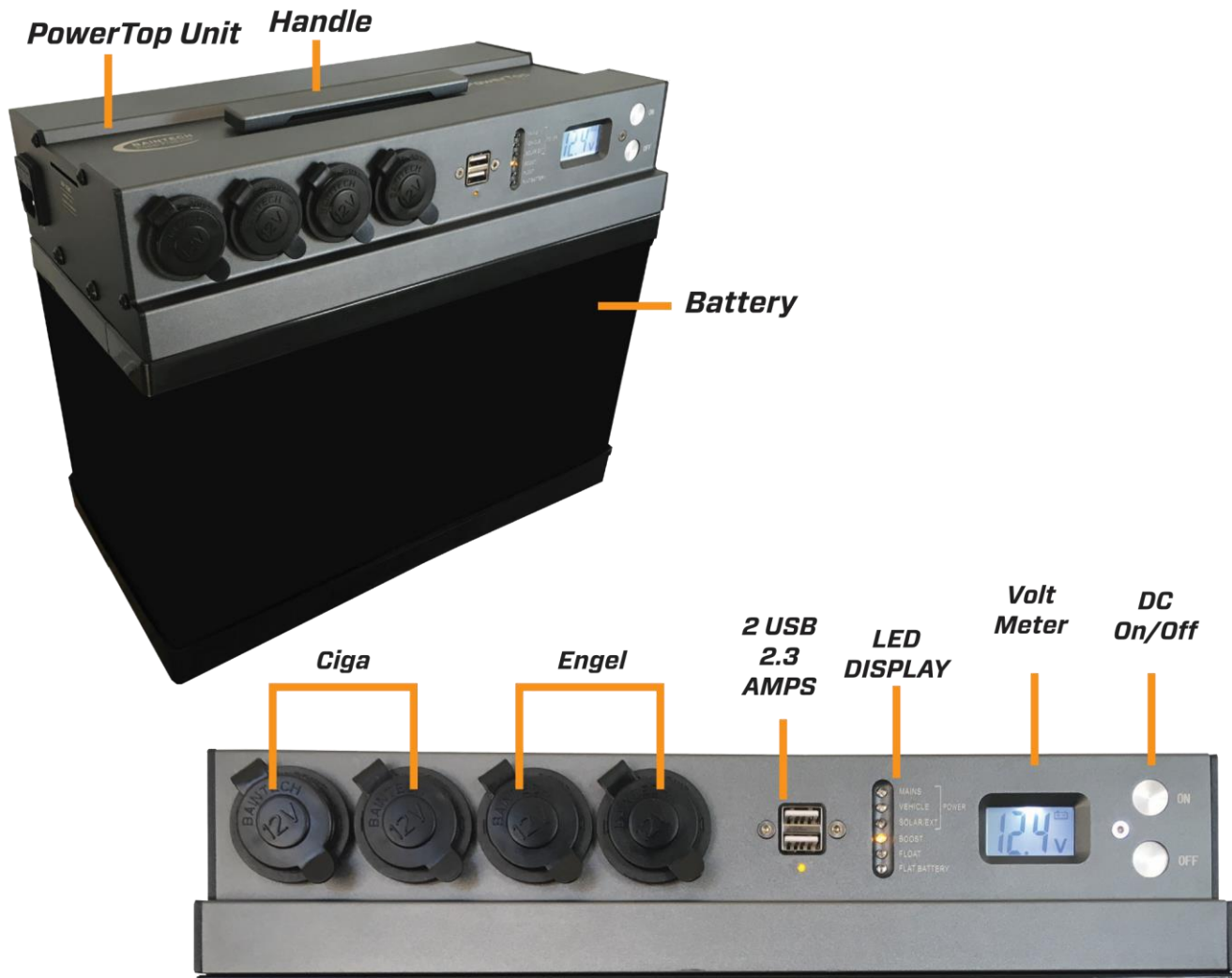
1. This appliance is not intended for use by young children, or infirm persons with reduced or impaired mental or physical capabilities, or persons with a lack of knowledge and experience unless directly under the supervision or instruction of a responsible party to ensure that safe use conditions are met.
2. This appliance is not a toy. If this appliance is in use in the vicinity of children, proper attention and supervision must be given to ensure that they do not play with this electrical device.
3. Use only as described in this manual. Do not undertake any maintenance unless described in this manual or advised recognized Service personnel.
4. Suitable for use in dry conditions only. Operate under shelter with adequate protection from elements.
5. Do not handle any part of the appliance with wet hands.
6. Damaged electrical cords are a hazard, In the case of damaged or frayed electrical cord DO NOT USE and seek replacement from manufacturer or similarly qualified person.
7. If the appliance is not working as it should, is damaged, or has been dropped, submerged in water or exposed to the elements for an extended period of time, discontinue use immediately and contact suppliers Customer Service.
8. Do not disassemble. Contact suppliers Customer Service when service or repair is required.
9. Do not stretch or place electrical cables under strain. Avoid placing cable where it can be stepped on or tripped over.
10. Keep appliance away from sources of fire and high temperature.
11. Avoid contact with and submersion in water.
12. Use only recommended accessories and replacement parts. Do not use any high capacity DC-DC charger beyond the recommended maximum charging current of 20A
13. If used in vehicle, ensure that the appliance is secured and fixed in place.
14. Charge in a well-ventilated location
15. Do not go beyond the maximum recommended load for each socket or panel
16. Warning against recharging non-rechargeable batteries
17. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance. If supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacture or its service agent.  
-Include a warning against recharging non-rechargeable batteries.

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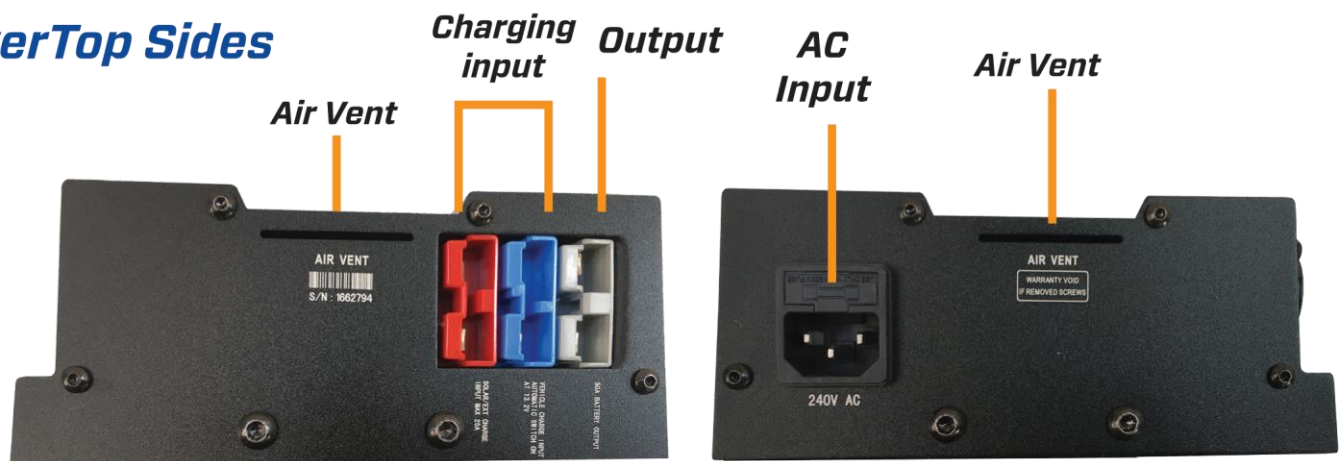
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## IMPORTANT

- Do not block air vents on the side of the unit
  - Ensure the PowerTop is mounted upright
  - Ensure the PowerTop is only used in a well-ventilated location
  - Ensure the PowerTop avoids contact with water
  - Opening the PowerTop unit or removing screws voids warranty
- Don't tilt PowerTop on end or sides - always keep upright



## PowerTop Sides



***Also included in the PowerTop Box:***

***AC Charger Cable***



***TRICOLOUR ANDERSON PACK***

Fitted 3x 50A Anderson type connectors

**RED: Solar/External**

(12V solar panel input can be unregulated)

**BLUE: Vehicle charge input connection**

**GREY: Power connection from battery**

Accepts regulated solar controller **only**

Protected by 50A thermal self-resettable breaker

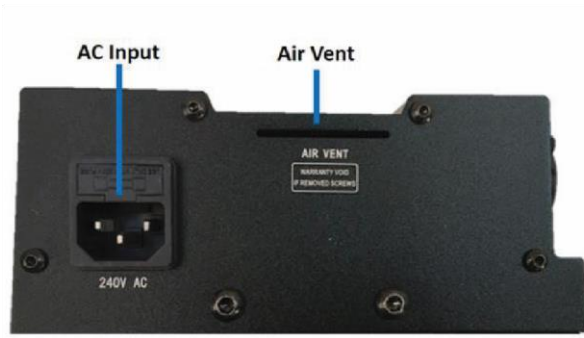
Can be used for 12 volt input and output power source in applications e.g:  
Inverter, DC-DC charger ( from smart alternator ), high current AC-DC charger,  
or a regulated solar controller directly from your battery

Parallel operation from a second Powertop.



# CHARGING

**IMPORTANT NOTE:** DC On/Off Switch must be ON for charging (see page 3 for switch location).



## Internal AC Charger

The PowerTop comes with an internal 6.6A AC charger. The charger operates when the AC plug is connected into the unit. When charging with the AC charger, **disconnect** all loads and remove the connections to the **Blue** and **Red** Anderson connectors. Disconnect the power to the AC charger after **16** hours, as the battery will be fully charged.

## MAINS LED Operation

When AC power is connected and powering the internal AC charger the MAINS LED will turn on. The MAINS LED will turn off when the internal charger output turns off, which will occur when the AC power is disconnected.



## Fast Charging

**IMPORTANT NOTE:** DC On/Off Switch must be ON for charging (see page 3 for switch location).

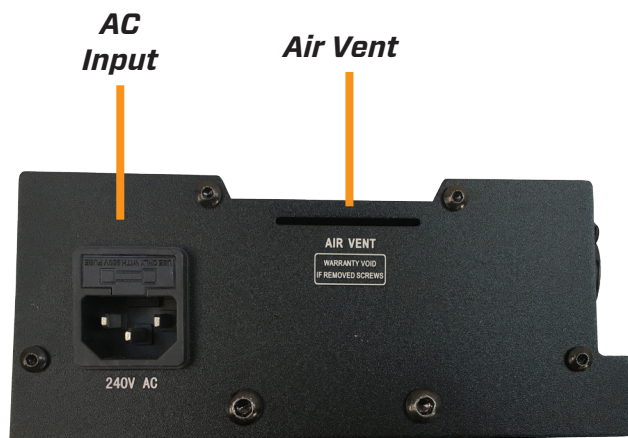
If you require faster charging we recommend using a 20A (maximum) charger suited for Gel batteries with the following voltage set points:

- Bulk 14.2V
- Float 13.7V

*The external charger is to be connected to the **Grey** Anderson connector labelled 50A Battery Output.*



## HOW TO RECOGNIZE WHEN YOUR POWERTOP IS CHARGED



The Powertop when fully charged will have a voltmeter reading of 12.8-12.9 volts on the LCD display. It is recommended to place it on charge after purchasing and every 21-28 days or so if kept in storage for any period. No need to leave it on indefinitely ( ie: float charging as it's called ) - as this will shorten the battery life.

As the voltage reading falls off - these are the typical readings you should see to determine the level of charge still in your battery >

**12.8 volts is 100% charged;**

**12.6 volts is 75% charged;**

**12.4 volts is 50% charged** < *Lowest recommended level of discharge to get best battery life.*

**12.2 volts is 25 % charged;** < *Use external charger when battery falls below this level.*

**12.0 - 11.9 volts is Empty.**

**11.0 volts** < *Flat Battery Audible Alarm* < ( See page 9 )

When charging with the internal charger - the meter voltage will rise up to 14.2 volts and then start to fall back down to about 13.7 volts Dc.

It may toggle between the BOOST and FLOAT levels before its fully charged. Once fully Charged the unit can be turned off at the wall socket. The BOOST light will stay on all the time except when the battery voltage is above 14.2V. The charge time for this to happen can vary depending on battery condition, but up to 16 hours maximum is required for a full charge to be realized.

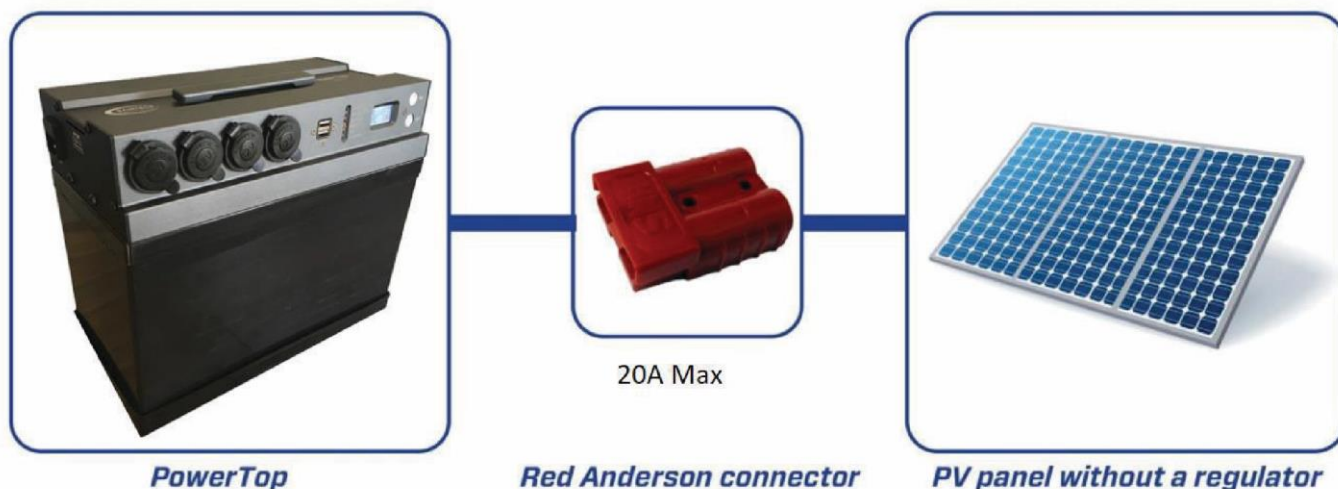
After turning off the Ac wall charger - the PowerTop will sit on a reading of 13.2 volts for a couple of hours - before settling down to the final 12.8 volt reading of 100% full; - whereby it will stay on that reading for a number of weeks before slowing discharging. This is with NO appliance plugged in and the unit sitting in storage.

Charging through the Red Solar, Grey with a Dc-Dc charger, or Blue Vehicle Anderson sockets, can speed the charging process up to be much quicker time frame ( ie around 6-8 hours ).

## UN-REGULATED SOLAR DC CHARGING

**IMPORTANT NOTE:** DC On/Off Switch must be ON for charging (see page 3 for switch location).

If you want to connect a DC charging source that is unregulated, for example a 12V PV panel (36 Cell) without a regulator it must be connected to the **Red** Anderson Connector input labelled Solar/External Charge.



The unit has a built in solar regulator that will stop the battery from being over charged. A maximum voltage for the unregulated solar panel cannot exceed 18 volts Dc in full sun (and measured with a volt meter only no other items connected to the 2 panel wires).

The maximum power of the solar panels can be between 120 watts up to 300 watts in total. If more than one panel is used keep them wired in parallel (positive to positive & negative to negative) with each panel having the same specification. DO NOT USE mixed panels sizes.

If a solar regulator is fitted to the panel, it must be used on the Gel battery setting (some cheaper units will have no selectable battery setting) and be plugged into the Grey Anderson socket.



### SOLAR/EXT LED Operation

The SOLAR/EXT LED will turn on when the Red Anderson Connector is inserted into the PowerTop input and will turn off when the Red Anderson Connector is removed. This LED indicates that the connector has been seated correctly and charging will depend on sunlight reaching the panel.

If a GREY Anderson connector is used for a regulated solar panel; the solar/EXT LED will not display on the LED panel; The LED will only display when using a RED Anderson socket.

## REGULATED SOLAR DC CHARGING

**IMPORTANT NOTE:** DC On/Off Switch must be ON for charging (see page 3 for switch location).

If the solar panel is supplied with a solar charge controller or you have an external solar charge controller they must meet the following requirements:

- 20A maximum charge current
- Bulk 14.2V
- Float 13.7V

If the solar charger controller meets these requirements connect the device to the **Grey Anderson connector** labelled 50A Battery Output.



### Vehicle Charging

**IMPORTANT NOTE:** DC On/Off Switch must be ON for charging (see page 3 for switch location).

If you want to charge the PowerTop from the vehicle alternator, connect a cable to the starter battery, connect the other end of the cable to the **Blue** Anderson Plug on the PowerTop labelled Vehicle charge input. Fuse the cable at the start battery end of the cable. The vehicle voltage must be above 13.2V to charge the PowerTop battery. Recommended fuse size is 35 AMPS max.





### Vehicle LED Operation

The Vehicle LED will turn on when the voltage on the Blue Anderson input is above 13.2V and will turn off when the voltage goes below 13.2V.

## DC-DC Vehicle Charging

**IMPORTANT NOTE:** DC On/Off Switch must be **ON** for charging (see page 3 for switch location).

If you have an external DC-DC charger they must meet the following requirements:

- 20A maximum charge current
- Bulk 14.2V
- Float 13.7V

If the DC-DC charger meets these requirements connect the device to the **Grey Anderson connector labelled 50A Battery Output**.



## FLAT BATTERY



**FLAT BATTERY LED** will switch on when battery voltage drops below 11V and will switch off when battery voltage is greater than 11V. When the FLAT Battery LED is on - an internal audible alarm will also activate.

## BOOST



### WHILE NOT ON CHARGE

The **BOOST** light is an indicator that the battery is either at or near full capacity and is ready for your portable power use. The light will remain illuminated while in use.

### WHILE CHARGING

**BOOST LED** indicates that the battery is being charged via the Solar/Ext (RED Anderson) and vehicle (Blue Anderson) inputs or on an AC charger. The BOOST cut out voltage is 14.2V and will cut in when the battery voltage drops below 13.7V.

## FLOAT



**FLOAT BATTERY LED** will switch on when the BOOST cut-out voltage is reached and will switch off when the BOOST cut-in voltage is reached. The FLOAT LED indicates the battery is not being charged via the Solar/Ext (RED Anderson) and Vehicle (Blue Anderson) inputs.

## LOAD CONNECTION

**IMPORTANT NOTE:** DC On/Off switch must be ON for load connections.

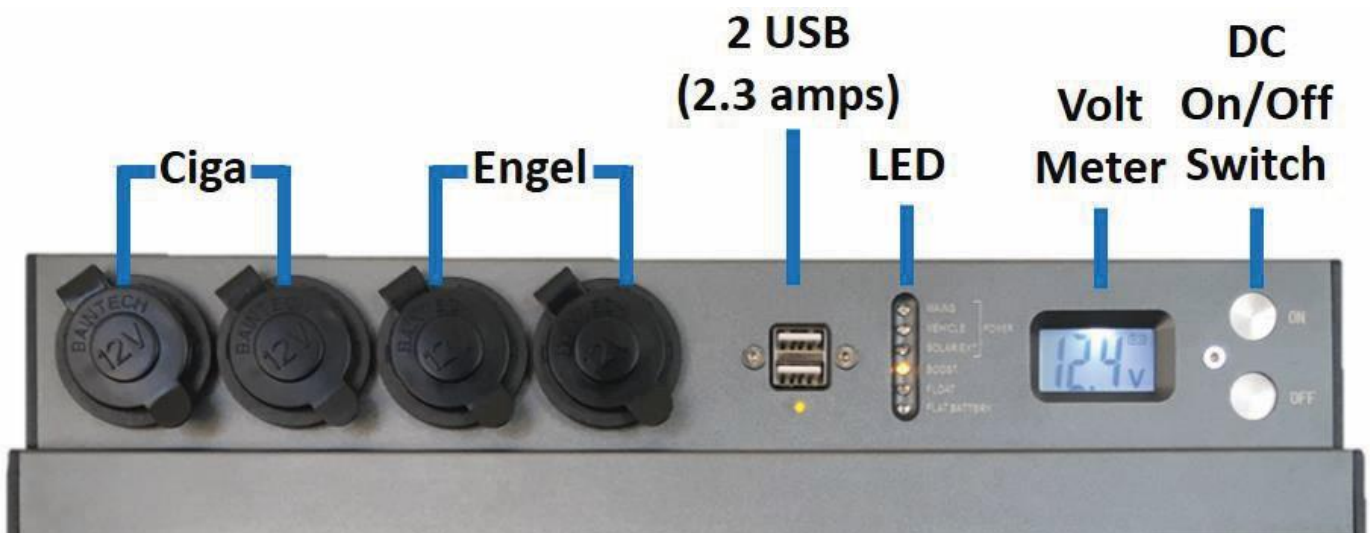
The **Grey** Anderson connector load output is protected by a 50A self-resettable thermal breaker. Maximum recommended load as a guide is under **500W**, dependent on ambient temperature.



Loads can also be connected to the following 12V DC Power sockets:

- Ciga     x 2     Maximum load/Socket 10A
- Engel   x 2     Maximum load/Socket 10A
- USB     x 2     Maximum load/Socket 5V /2.3A

Sockets output are protected by a 20A self-resettable thermal breaker. Maximum recommended load across all sockets as a guide is **200W**, dependent on ambient temperature.



# POWERTOP TECHNICAL INFORMATION

## Features

- 12V 100Ah Gel battery
- Top of unit made from anodised aluminium
- In-built 6.6A AC connected battery charger
- In-built electronics (VCR) for accepting charge from vehicle input, for voltages above 13.2V
- LCD voltmeter with LOW volt (@ below 11.5 Volt) audio alarm buzzer
- Low Voltage Shutdown (@ below 11V)
- DC On/Off push button switch for the unit
- Total four 12V DC power socket outlets
  - o 2 x Engel Socket
  - o 2 x Ciga Sockets
  - o Protected by 20A thermal self-resettable breaker
  - o 2 x Universal USB Socket (5V/2.3 amp each)
- 6 LED indicators:
  - o MAINS o VEHICLE
  - o SOLAR/EXTERNAL
  - o BOOST
  - o FLOAT
  - o FLAT BATTERY
- Fitted 3x 50A Anderson type Connectors
  - o Red: Solar/External (12V solar panel input can be unregulated)
  - o Blue: Vehicle Charge Input connection
  - o Grey: Load connection to and from battery
    - Protected by 50A thermal self-resettable breaker
    - Can be used for external higher power regulated output from a AC charger, DC-DC charger or solar charger to charge the battery

## Specifications

Battery Type	12V/100Ah Sealed Lead Acid Battery
In Built Battery Charger Mains input voltage DC output voltage	6.6A 15V DC Charger 240V AC 15V DC
Vehicle input charging voltage	Cut-In Voltage Above 13.2V
Volt Meter, low voltage alarm indicator and audible alarm	Below 11.5V
System Shut Down Voltage	Below 11.0V & Above 15V
Socket Protection	20A Self-Resettable Breaker
Grey Anderson plug (output) protection	50A Self-resettable breaker
USB Socket Output	5V 2.3A
Maximum Load across all sockets	200W
Dimensions (L x W x H)	330 x 175 x 275 mm
Weight	32kg
Warranty	12 months

- After warranty period service is available.
- **Opening unit voids warranty.**

## ***DO'S AND DONT'S***

### DO's:

1. Do fully charge the PowerTop before using it for the first time.
2. Do charge the battery immediately if the warning alarm comes on. The warning comes on at 11.5 Volts. It is good practice not to let the battery remain below 12 Volts without recharging.
3. Do keep the PowerTop fully charged to maintain battery at optimum capacity. Repeated deep cycling (deeply discharging the battery) reduces battery life. Where practical, plug the PowerTop to the mains or other power supply to keep the battery fully charged.
4. Do disconnect all the loads and remove the connections to Blue and Red Anderson connectors while using the AC internal charger.
5. Do use the maximum recommended DC-DC charger rated at 20A.
6. Solar charging - regulated charging through Grey Anderson plug and unregulated charging through Red Anderson plug. DC ON/ OFF switch must be ON while charging from Solar.
7. Do follow the ratings and connections for Solar charging as mentioned in page 7.
8. Do charge in a well-ventilated location.
9. Do make sure the PowerTop is kept in an upright position.
10. Do keep it away from sources of fire and high temperature.
11. Do avoid contact and submersion in water.
12. Do secure and fix the PowerTop before any off-road adventure.

### DONT's:

1. DON'T connect any load while charging through internal AC charger, it is only a 6.6A charger.
2. DON'T use high capacity DC-DC charger beyond the recommended charging current (max 20A).
3. DON'T go beyond the recommended load for each socket as mentioned in page 10.
4. DON'T open the unit, it will void the warranty.
5. DON'T block air vents of the PowerTop
6. This appliance is not intended for use by young children, or infirm persons with reduced or impaired mental or physical capabilities, or persons with a lack of knowledge and experience unless directly under the supervision or instruction of a responsible party to ensure that safe use conditions are met.
7. Damaged electrical cords are a hazard, in the case of damaged or frayed electrical cord DON'T use and seek replacement from the supplier.
8. DON'T Recharge non-rechargeable batteries.

## FAQ'S

**Q: Is the PowerTop battery replaceable?**

*Yes, battery can be replaced.*

**Q: How can I increase the charging speed?**

*For faster charging of your PowerTop, you can connect an external 20A maximum charger suitable for Gel batteries following the instructions on page 5 of this manual.*

**Q: Can I remove the screws and open up the PowerTop?**

*No, the PowerTop is designed to be a self-contained unit, removing any screws voids the warranty of the unit.*

**Q: Should I use a regulated or unregulated solar panel with the PowerTop?**

*For unregulated solar panel connection through the red Anderson plug read page 6. For regulated solar panel connection through the grey Anderson plug read page 8.*

**Q: If the vehicle voltage is not above 13.2 V can I charge from the vehicle?**

*Yes, you can. For the old dual you need to use the Grey Anderson plug instead of Blue Anderson plug with a DC-DC charger such as CTEK D250S Dual. The car smart alternator will be connected to the "solar input" (not alternator input) of the D250S Dual through a change-over relay and the output of D250S Dual is connected to the Grey Anderson plug of the PowerTop. The relay will ensure the charging is stopped as soon as the vehicle ignition is turned off so that the car battery does not go flat. The relay will also ensure any solar panel connected is charging the system through the Dual's MPPT and the charging current from the vehicle alternator gets switched through to the DC-DC charger. The solar input of the Dual works as low as 12 volts (unlike all others which are 13.2 volts) which is the major reason you need this setup with a smart alternator charging system. For the new D250SA – You need no relay; simply install as per the user manual. The Grey Anderson connector accepts the D250SA.*

**This manual is subject to change & specifications may vary without any notice.  
Please see for the latest version of this manual (Version 3 of the PowerTop) .**