

SOLAR POWER BATTERY CHARGER

2 FOLDING SOLAR PANELS
80W, 100W, 120W 160W

(With built-in LED Indication Automatic Controller)



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PREFACE

Thanks for buying the Solar Panel, another high-quality machine from our company.
To get the most out of your purchase, please read the manual before using the Solar Panel.

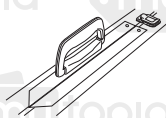
We ask you to please read this manual carefully beforehand in order to familiarise yourself with this product and after reading, please store this instructional manual for future reference. Failure to follow the proper protocols listed in the manual may cause personal injury to the operator or damage to equipment.

FEATURES



CONVENIENT CARRY BAG

Made of high denier (600d), this water resistant polyester bag is fully padded with reinforced corners and protectors to ensure safe transportation and staging.



EASY CARRY HANDLE AND SAFETY FASTENERS

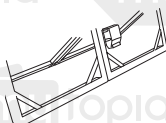
Panels are fitted with a heavy duty handle allowing for easy handling and removal from the protective carry bag. Two clip-type safety fasteners lock the panel shut during transportation.



BUILT-IN SMART SOLAR CONTROLLER WITH LED INDICATION

Mounted behind the panels, this controller ensures the safety of the panels and the batteries. This SMART controller will automatically cut out when the batteries are either fully charged, during solar panel discharge, and in situations where reverse polarity may exist. The controller features a switch allowing use with lead-acid and gel type batteries.

Constant GREEN LEDs: Indicates fully charged.



FOLD AWAY SUPPORT LEGS

Unique folding system which is easy to open and close, keeping the panels at the desired angle without slipping.

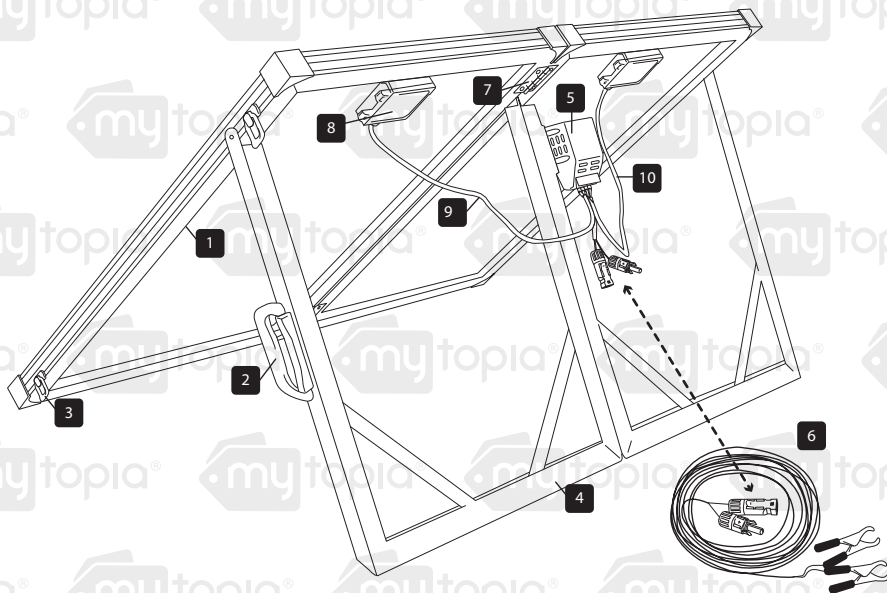
The angle can be easily adjusted throughout the day to ensure maximum sun exposure and maximum power output.



CONNECTING CABLES

Comes with MC4 cables to connect the solar control board to a battery.

COMPONENTS



1. Folding 2 Mono-Crystalline silicon solar panels with heavy duty anodised aluminium frame.
2. Heavy duty ABS handle.
3. Heavy duty steel safety fasteners.
4. Heavy duty Aluminum fold support legs.
5. Automatic SMART solar charge controller with LED (Green/Yellow) indicators.
6. 10m cable extending from the controller.
7. Hinges.
8. Solar panel junction box.
9. Connected cable between the left solar panel and the controller.
10. Connected cable between the right solar panel and the controller.

SPECIFICATIONS

SOLAR PANEL

MODEL	80W	100W	120W	160W
Type	Mono-Crystalline	Mono-Crystalline	Mono-Crystalline	Mono-Crystalline
Max Power (Pmax)	80W (2 x 40W)	100W (2 x 50W)	120W (2 x 60W)	160W (2 x 80W)
Open Circuit (Voc)	23.2V	25.2V	31.5V	23.2V
Open Circuit Current (Isc)	2.49A	2.83A	2.72A	4.98A
Max Power Voltage (Vmp)	16V	18V	24V	16V
Max Power Current (Imp)	2.5A	2.78A	2.5A	5A
Panels folded size (mm)	550 x 550 x 35	640 x 550 x 35	816 x 550 x 35	1075 x 550 x 35
Panels open size (mm)	1100 x 550 x 35	1280 x 550 x 35	1632 x 550 x 35	2150 x 550 x 35
Operating Temperature	-40°C~+85°C	-40°C~+85°C	-40°C~+85°C	-40°C~+85°C
Weight	9kg	10kg	12.5kg	15.3kg

SOLAR PANEL CONTROLLER

Type	SMART – Automatic
Rated Voltage	12VDC
Rated Current	7A
Max. Input Voltage	25V
Operating Voltage	8V (Min Charge Start Controller will not work with a battery lower than 8V)
Operating Temperature	-20°C~+60°C

RECOMMENDED BATTERIES (NOT INCLUDED)

Type	12V (60Ah~100Ah) Lead-Acid or GEL type
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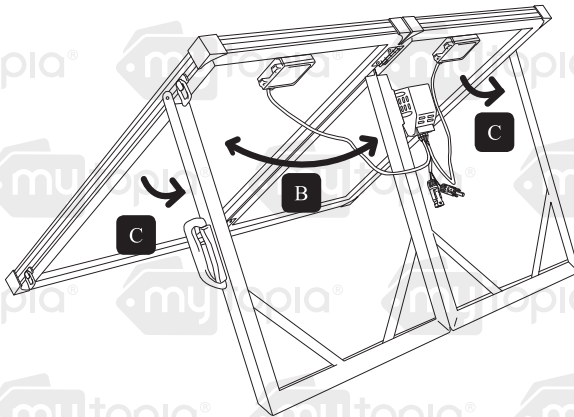
INSTALLATION & CONNECTION

STEP 1: LOCATION

Identify the best location allowing for maximum sun exposure. Location should be well ventilated. Keep away from hazards such as camp fires, water, high-traffic areas, shadows, etc.

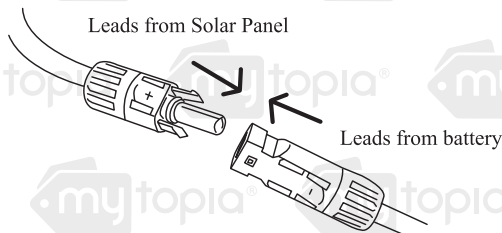
STEP 2: SET-UP (NO TOOLS REQUIRED)

- Remove the solar panel kit from the padded bag.
- Open the folding solar panels and fold out the support legs.
- Adjust the legs to provide the desired angle and direction that allows maximum sun exposure. Secure panels in position.
- Direction and angle can be adjusted throughout the day for maximum power.



STEP 3: CONNECT PANELS

Plug in your battery leads to the supplied output cords.



STEP 4: CONNECT TO THE BATTERY

Connect the battery clamp extension to the panels. The battery clamps are color coded, red for positive and black for negative.

Be sure to connect to the correct polarity (The positive red clamp to the positive battery pole, the negative black clamp to the negative battery pole).

CONNECTING THE CLAMPS IN REVERSE POLARITY MAY CAUSE IRREPARABLE DAMAGE TO THE CONTROLLER AND/OR PANEL.



PLEASE NOTE: There is no power output until the unit is connected to a battery.

When the solar panel kit is first connected to a battery and exposed to the sun, the charge controller must undertake a self-check program to ensure that it is operating correctly.

This program will take up to 3 minutes to complete and during this time the LEDs on the charge controller will vary in display. Once the self-check is completed, the system will engage and commence the charging process.

SAFETY PRECAUTIONS

1. Read and completely understand this instruction manual before use. Always keep this manual in a convenient location. A pocket is provided on the padded bag for the instruction manual.
2. To reduce the risk of injury, charge only 12V lead-acid batteries, AGM and GEL batteries. Other types of batteries may be subject to bursting which can lead to personal injury and property damage.
3. Always operate in a well-ventilated space. Batteries emit explosive gases. These explosive gases can be ignited by a spark, cigarette or naked flame such as a cigarette lighter or matches.
4. Make sure the voltage of the battery being connected is the same as the output voltage of the solar controller.
5. Make sure to connect with correct polarity (positive pole to the positive pole, negative pole to the negative pole).
6. Battery must be removed from the vehicle when connecting to the solar controller.
7. Keep away from explosive gases, flames, smoke and sparks.
8. Keep away from any flammable substances.
9. Always adhere to battery manufacturer's recommendation when charging batteries.
10. Given sufficient light, solar panels always generate energy even when they are disconnected. Accidental 'shorting' of the terminals or wiring can result in spark causing personal injury or fire hazard.
11. This unit is not intended for use by young children or disabled person without supervision.
12. Always avoid charging old, damaged, overly discharged defective battery.
13. When testing or working on or around a battery, it is advisable to wear protective goggles/eyeglasses.
14. Have plenty of fresh water and soap available in case battery acid from into contact with skin, eyes or clothing.
15. If the battery acid comes in contact with the skin or clothing, flush immediately with large amounts of water. In case of accidental eye contact with battery acid, flush eyes for at least 15 minutes with clean water. The eyes should be submerged under water and kept open. See a doctor immediately. Do not use eye drops or other medication unless instructed by a doctor.
16. When working with a lead-acid type battery, be careful not to short-out the battery with a metal tool or object. Remove all personal items such as watches, rings, bracelets and necklaces. The possibility of a short circuit exists, which can damage such items and cause severe burns and/or personal injury.
17. Keep the surface of the solar panels clean from dust by cleaning it with a soft cloth. Do not walk on modules.
18. Keep solar panel free from contact with water, acid or alkali.
19. Do not scratch or bend solar panels.
20. Do not disassemble or open the solar panels and the controller. There are no user-serviceable parts in this unit.
21. Mount the solar panels at a height adhere to all relevant safety regulations.
22. Do not pack heavy items on top of the solar panels when storing or transporting.

TROUBLESHOOTING GUIDE

Q: HOW DOES THE SOLAR PANEL WORK?

A: The solar panel converts sunlight energy into DC electric power and can be used to charge a rechargeable battery.

Q: HOW MANY SOLAR PANELS WILL IT TAKE TO RUN MY APPLIANCES?

A: As a general rule, the user should establish the amps required to run the appliances and then by the expected module voltage.

POWER CALCULATIONS:

Amp Hours (Ah) = Current (Amps) x Working Time (Hours)

Module Power (W) = Current (Amps) x Expected module voltage (V)

After completing these calculations the capacity of the solar panels can be established.

Example: The following table represents a typical portable appliance configuration.

APPLIANCE	WATTS	VOLTAGE	AMPS	HOURS	AMP HOURS
12V Fluorescent Light	8	12	0.65	4	2.6
12V BandW Television	20	12	1.67	1	1.67
12V Radio	5	12	0.42	1	0.45
12V Fan	4	12	0.33	5	1.65
12V Travel Iron	120	12	10	1/6	1.67
12V Fridge	45	12	3.75	6	22.5
Estimated Consumption					30.51

Amps Hours: 30.21 Amp Hours per day

Assumption: The solar panel is exposed to 6 hours of suitable sunlight each day.

The required current from the system would be 30.51 Amp Hours/6 Hours = 5.09 A.

The required watts of the system would be: 5.09A x 12.2V / 0.8 = 110W

(17.2 – Module Vmp, 0.8 – Power Consumption Factor)

In this example, a 110W panel is required to run the appliances for the desired time.

Q: HOW MUCH BATTERY CAPACITY IS REQUIRED?

A: Solar power systems are generally sized to give plenty of reserve (autonomy) in the batteries.

BATTERY CAPACITY CALCULATION:

Current (Amps) x Hours = Amp Hour (Ah)

In the example above, we have determined that it is required to have 30.51Ah current per day.

It is not good to run a battery all the way down to zero during each charge cycle.

For the example above, at least 30% is needed to be left in the battery.

We need at least $30.51\text{Ah} / 0.7 = 43.6\text{ AH}$ battery for each day use.

If the battery is going to be used for 3 days without charging, then the minimum battery capacity recommended would be $43.6 \times 3 = 131\text{ Ah}$ at related discharge rate.

PLEASE NOTE:

- Solar panels and its controller are maintenance-free.
- There are no user-serviceable parts in this unit.
- If you have any problems, please contact the supplier immediately.

THE CHARGE LED DOESN'T GLOW GREEN

- Ensure the panels are exposed to sunlight.
- Ensure all panel cables are free from damage and are connected correctly.
- Ensure the cables from the controller to the battery are free from damage and connected correctly.
- Check the battery voltage. If the battery voltage is less than 8V, the controller will not work.
- Check the fuse. The fuse will typically be blown for the following reasons:
 - Battery poles +/- are reversed or a short circuit occurred.
 - Solar controller output current over 10A.
- Check battery voltage. Battery is most likely not fully charged.
- Inspect and test the battery. Check if the battery is in good condition.

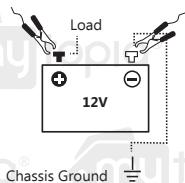
THERE IS NO VOLTAGE OUTPUT READING FROM THE PANEL

- Check if the output cables are connected to the battery correctly.
- The Panel is fitted with an SMART controller that will not allow any output if the panel is not connected. This protects the solar panel.

TYPICAL BATTERY CONNECTIONS

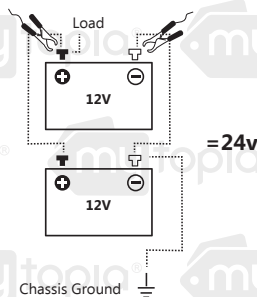
NORMAL CONNECTION

✓ **CORRECT**



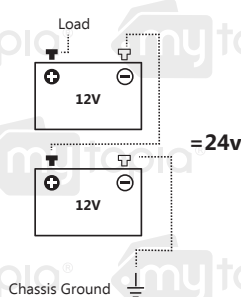
PARALLEL CONNECTION

✓ **CORRECT**



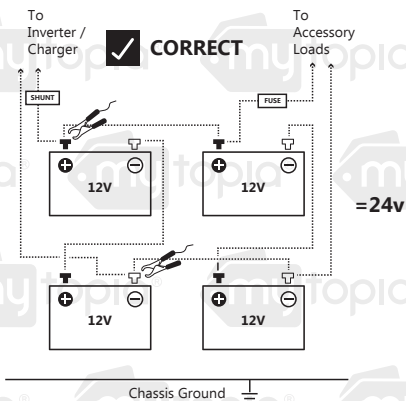
SERIES CONNECTION

✓ **CORRECT**

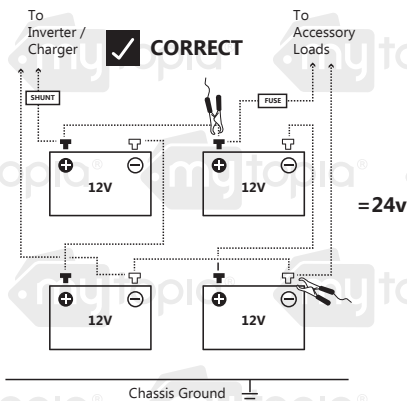


TYPICAL SERIES CONNECTION

✓ **CORRECT**

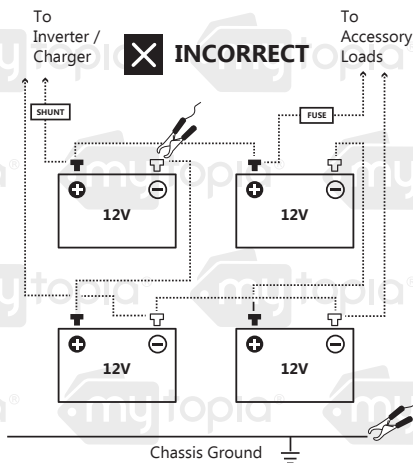
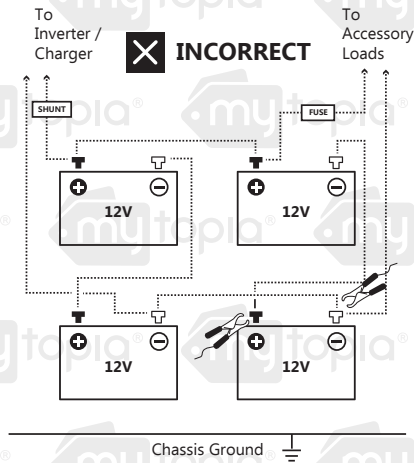


✓ **CORRECT**



INCORRECT BATTERY CONNECTIONS

TYPICAL SERIES / PARALLEL RV INSTALLATION





Some experts believe the incorrect or prolonged use of almost any product could cause serious injury or death. For information that may reduce your risk of serious injury or death consult the points below and additionally, the information available at www.datastreamserver.com/safety

- Consult all documentation, packaging and product labelling before use. Note that some products feature online documentation which should be printed and kept with the product.
- Check product for loose / broken / damaged / missing parts, wear or leaks (if applicable) before each use. Never use a product with loose / broken / damaged / missing parts, wear or leaks (if applicable).
- Products must be inspected and serviced (if applicable) by a qualified specialist every 6 months assuming average residential use by a person of average weight and strength, above average technical aptitude, on a property matching average metropolitan specification. Intended use outside these guidelines could indicate the product is not suitable for intended use or may require more regular inspection or servicing.
- Ensure all possible users of the product have completed an industry recognised training course before being given access to the product.

- The product has been supplied by a general merchandise retailer that may not be familiar with your specific application or your description of the application. Be sure to attain third party approval for your application from a qualified specialist before use regardless of prior assurances by the retailer or its representatives.
- This product is not intended for use where fail-safe operation is required. As with any product (take an automobile, aircraft, computer or ball point pen for example) there is always a small chance of a technical issue that needs to be repaired or may require replacement of the product or a part. If the possibility of such failure and the associated time it takes to rectify could in any situation inconvenience the user, business or employee or could financially affect the user, business or employee then the product is not suitable for your requirements. This product is not for use where incorrect operation or a failure of any kind, including but not limited to a condition requiring product return, replacement, service by a technician or replacement of parts could cause a financial loss, loss of employee time or an inconvenience requiring compensation.
- If this item has been purchased in error considering the points above simply contact the retailer directly for details of their returns policies if required.

