German Certified Panels

EcoOnline™

Solar PV Panel

For 10W-120W Solar PV Panels

Installation Manual & User Manual - Revised 23/05/2017

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Contents

1 Key Terms

Congratulations on the purchase of your EcoOnline™ Solar Panel. Please print this manual out for your reference. Please take the time to read the manual before starting any work. Particular attention should be given to text contained in the following key terms.

Please note EcoOnline has a strong product safety policy; do not install products without reading safety guidelines in the manual. Please report any product safety issues or near misses to info@EcoOnline.com.au no matter how trivial.

 DANGER	Indicates a **SAFETY** issue that **is likely to** cause injury or death if the user does not follow the instructions.
 WARNING	Indicates a **SAFETY** issue that **may** cause injury or death if the user does not follow the instructions.
 CAUTION	Indicates a **SAFETY** issue that **may** cause injury or property damage if the user does not follow the instructions
 Read Carefully	Refers to **critically important** information related to the **correct functioning** of the system.
 Tip	Refers to useful information for the **optimal operation** of the system

2 Safety Requirements

 DANGER	Never connect solar panels to batteries directly. Only connect to a battery through a suitable charging regulator.
 WARNING	Always use appropriate gauge wires. Never exceed the rated **Ampacity** (amp rating) of a wire. Keep in mind that **wires situated in highly insulated environments cannot dissipate heat** and hence will have a much lower Ampacity. This could lead to a fire hazard.
 WARNING	If you are unskilled in making safe electrical connections, we recommend all electrical connections be carried out by a certified electrician. **Loose, corroded or fatigued electrical connections can become resistive and overheat creating a fire hazard.**
 WARNING	What follows are general installation guidelines, **they should NOT be taken to be appropriate for all installation situations**, if in doubt please seek advice from a certified electrician.

3 Warranties

EcoOnline™ offers the following Warranties

- 20 year limited Warranty on all solar panels

See EcoOnline.com.au Terms and Conditions page for further details.

4 Are You Setting up Charging System?

Firstly, please visit our online sizing calculators to size your system. They will help you understand important factors involved in sizing a solar charging regulator system.

1. Solar Panel Sizing Calculator (this will help you understand the factors involved in a **sizing solar panels**)
2. Solar Regulator Calculator (this will help you understand the factors involved **sizing a regulator**)
3. Solar Wire Sizing Calculator (this will help you understand the factors involved in **sizing wire gauges**)

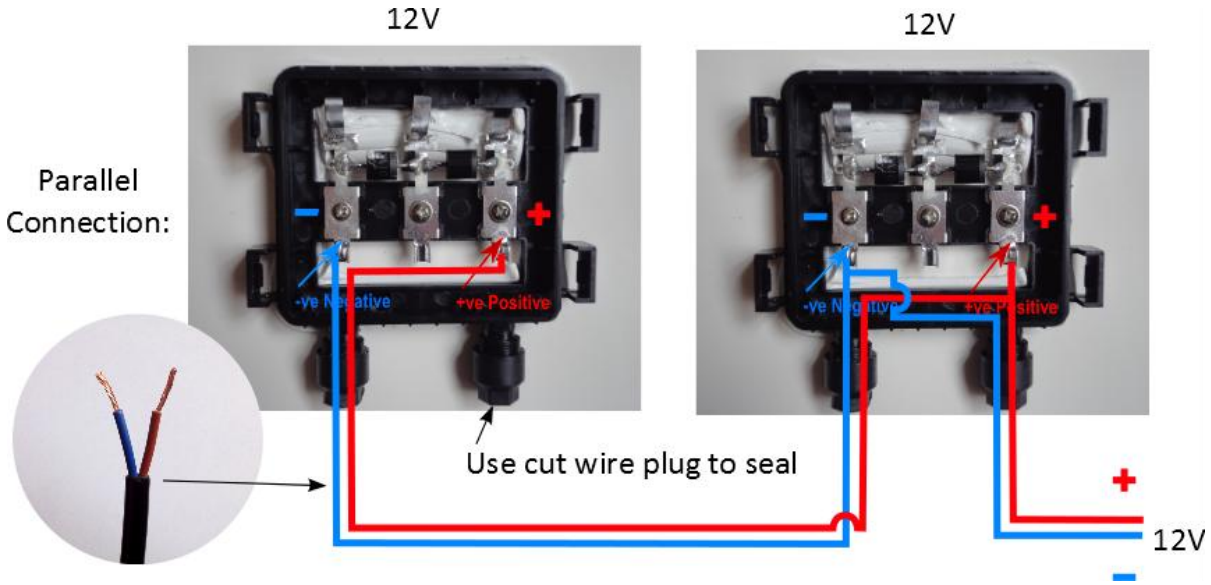
 WARNING	A charging system must be sized right, for efficiency, reliability and **safety**. If in doubt please seek advice.

5 Solar Panel Wiring Diagrams

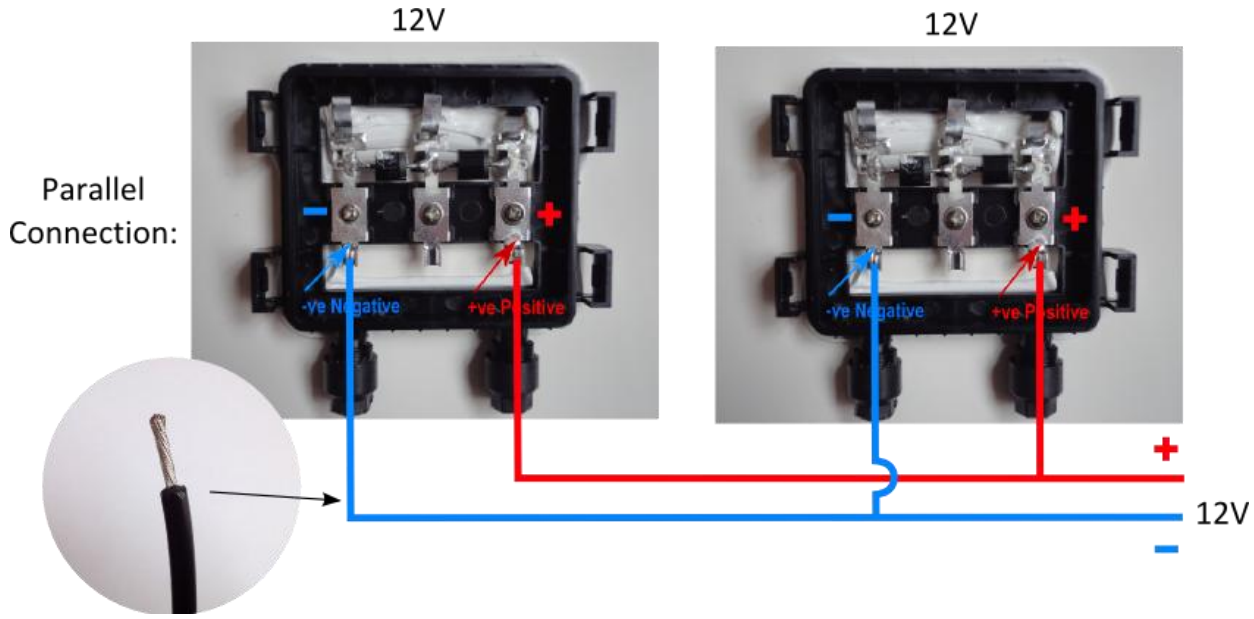
Here you will find the ***in parallel*** and ***in series*** connection diagrams for wiring two (36 cell) solar panels together if required.

WARNING	**NEVER screw clamp solder tinned wires to the junction box terminals.** Positive and negative wires must be soldered onto the solar panels terminals in the junction box.
CAUTION	Always check that the solar modules are wired for the same voltage as the battery by using a **multimeter**. Open circuit voltage of a "12V nominal" or 36 cell solar panel or in parallel connected solar panels should be around 21V. This should be doubled for a 24V system.

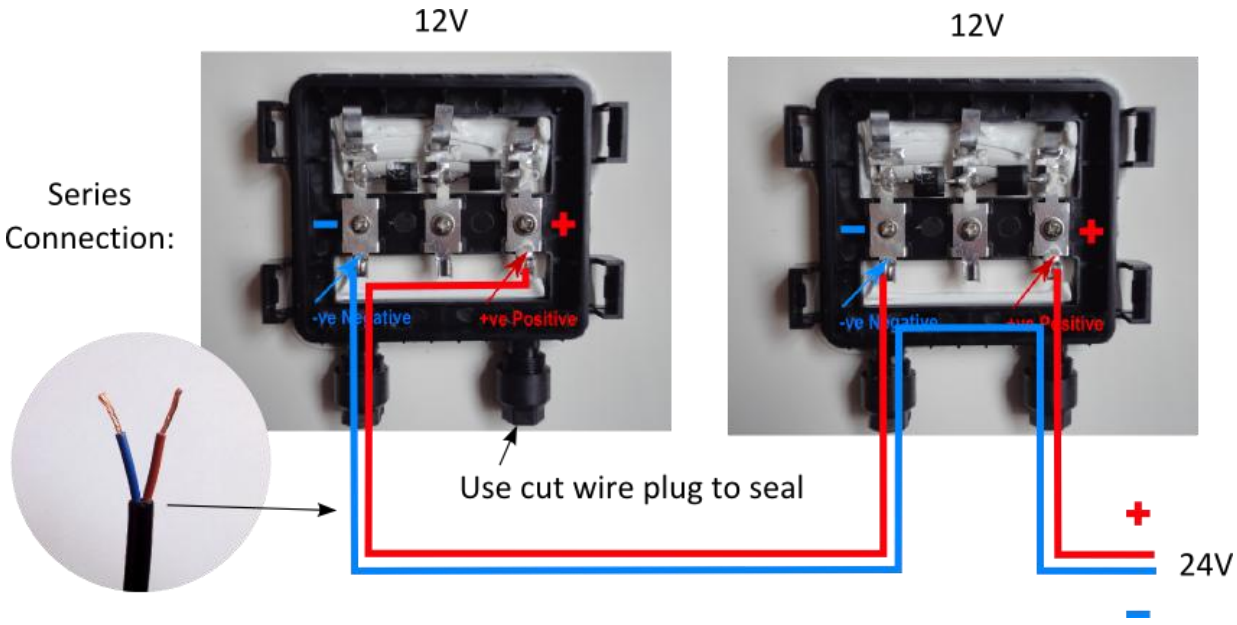
5.1 In Parallel Connection Using Twin Cord Wire – for 12V system



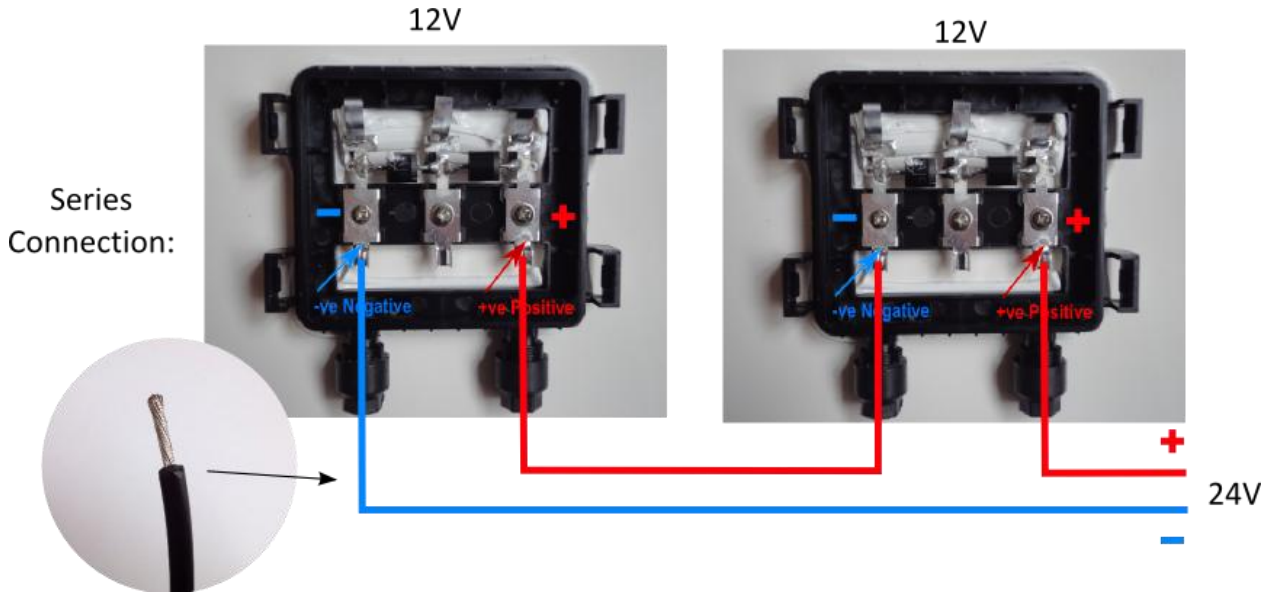
5.2 In Parallel Connection Using Single Cord Wire – for 12V system



5.3 In Series Connection Using Twin Cord Wire – for 24V system



5.4 In Series Connection Using Single Cord Wire – for 24V system

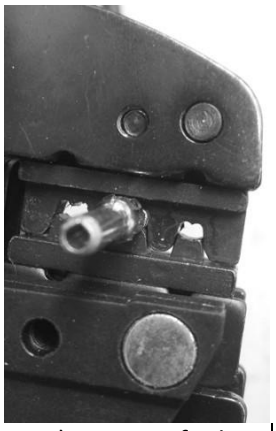
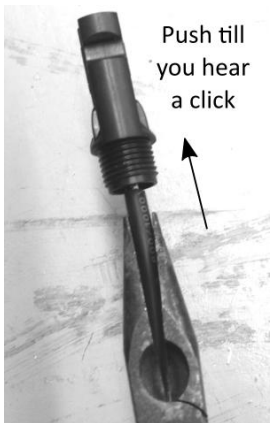


CAUTION

Panels wired in series must be of equal power and face exactly the same direction.

6 Connecting the MC4 Connector

Your solar panel may have come with wire and MC4 connectors on the ends. You will need to source compatible opposing MC4 connector plugs to make connections to the solar panels MC4 connectors (if not purchased).

				
1) Strip ~1cm length	2) Use certified crimp tool	3) Recommend you also solder crimp	4) Use alligator pliers to push in	5) Use 2 pliers to do up end cap


Read Carefully

Note: the **male metal pin is used in the female plastic MC4** connector and vice verse for the female metal pin.


WARNING

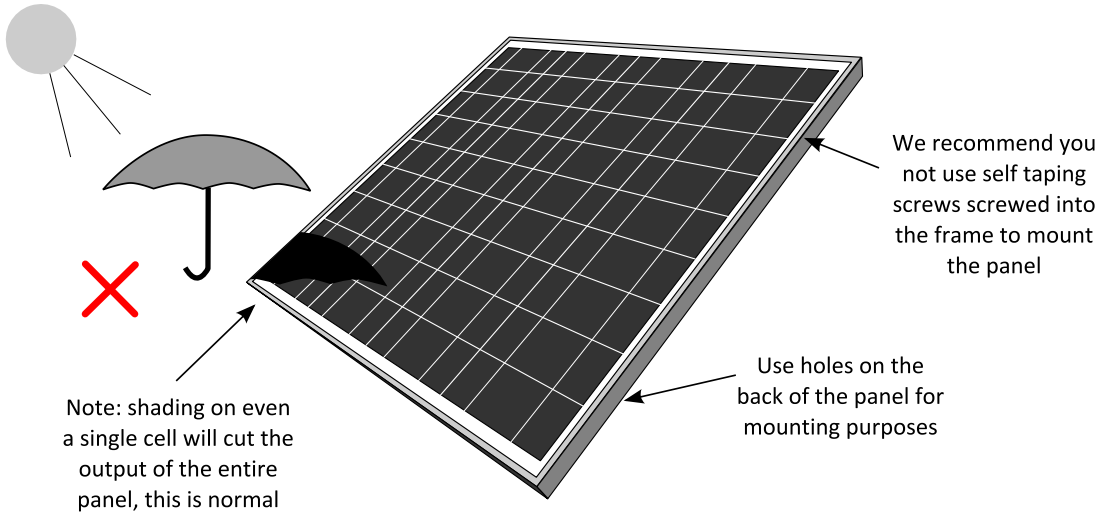
The MC4 connector metal pin must be crimped onto the solar wire using appropriate Australian Standard crimping tools. We recommend you also solder the crimped connection for better electrical contact, but **only after a secure and tight crimp is performed.**

7 Mounting the Solar Panel(s)

7.1 Mounting on Building Roof or Caravan


WARNING

If the panels are to be mounted on a building roof **always check council/building regulations in your area**. We recommend roof mounting of panels be performed by a qualified professional that can advise on appropriate mounting means for your situation.



Generally, when mounting panel we also recommend:

- Panel(s) should be mounted **as close to the ground as possible** for **ease of maintenance**, **reduced wind loading**, **shorter wire runs** and a **reduced chance of lighting strike**
- Electrical connections in junction box **MUST be soldered on**.
- The **underside moisture barrier should not be scratched** as this the will severely limit panel lifetime.
- **Screwing self taping screws** into the side of frame should not be used as a mounting means; use the bolt holes on the back with locking bolt & nut set or commercially available mounting means.
- Panels should be installed with 20mm to 50mm underside ventilation gap.

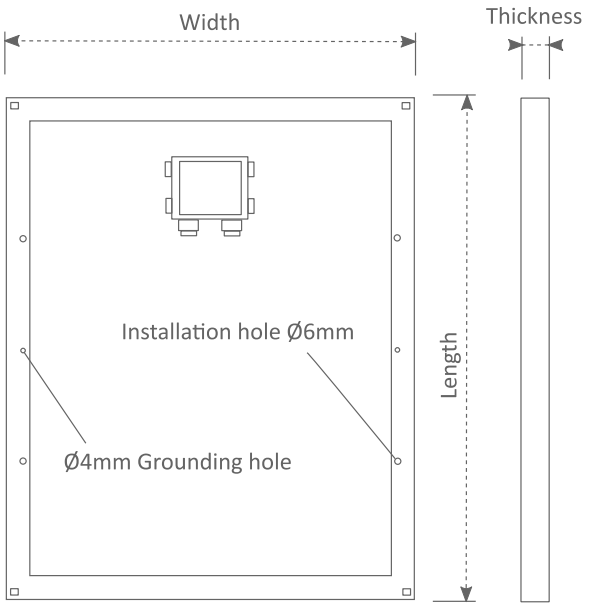
7.2 Portable/Folding Solar Camping Panel(s)

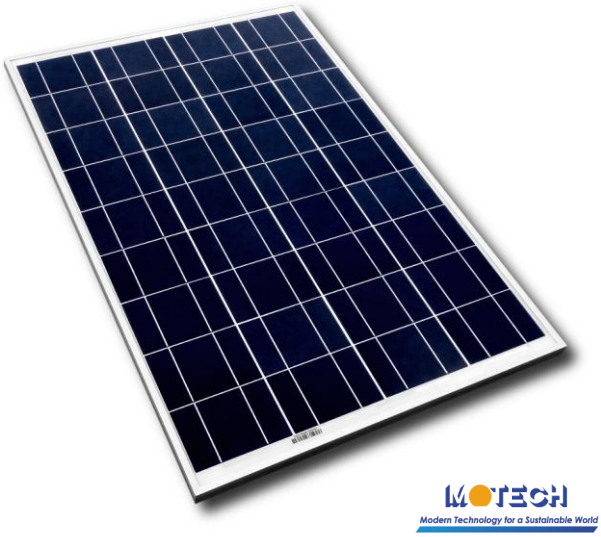
 WARNING	We recommend portable/folding panels are placed on a secure, flat, **non-flammable surface** exposed to the sun. As a precaution **do not place panels in dry flammable grass for example**.
 Read Carefully	We recommend the portable/folding panels be put away in very strong wind, or if there is a chance of lighting.

8 Panel Specifications

Panel Characteristics	M10W	M20W	M40W	M60W	M80W	M100W	M120W
Maximum power (P_{max})	10W	20W	40W	60W	80W	100W	120W
Power Tolerance	+0-10%						
Voltage at max power (V_{mp})	17.4V						
Current at max power (I_{mp})	0.57A	1.15A	2.3A	3.45A	4.6A	5.75A	6.89A
Open circuit voltage(V_{oc})	21.6V						
Short circuit current (I_{sc})	0.63A	1.27A	2.57A	3.79A	5.06A	6.33A	7.58A
Operating Temperature	-40°C to +85°C						
Maximum System Voltage	700V						
Maximum Series Fuse Rating	1A	2A	3A	5A	10A		
Standard Test Condition	Irradiance:= 1000Wm^2, Module Temperature:= 25˚C, AM:=1.5						
Mechanical Characteristics							
Panel Length	340mm	430mm	670mm	670mm	830mm	1015mm	1260mm
Panel Width	240 mm	340mm	540mm	630mm	670mm	670mm	670mm
Panel Thickness	25mm				30mm		
Cell Type (Varied)	MOTECH Multicrystalline Silicon						
Number of Cells	36 cells						
Weight	1.4Kg	2.5Kg	4.3Kg	5.2Kg	5.6Kg	7.1Kg	8.8Kg
Hail / Wind Resistance	227g steel ball dropped from 1m height / 60m/s wind						
Output Cables/ Connectors	None				1m x 2.5mm^2 / MC4		
Warranty	P_{max} is not less than 90% in 10 years and 80% in 20 years						

Temperature Coefficients
Current temperature coefficient: 0.06% ± 0.01%/K
Voltage temperature coefficient: 78 ± 10 mV/K
Power temperature coefficient: 0.5% ± 0.05%/K





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9 Maintenance

WARNING

Important: before carrying out any system maintenance you MUST check for any manual updates and download the latest installation manual from www.EcoOnline.com.au/downloads

The following inspections and maintenance tasks are recommended at least two times per year for any battery charging system.

- Check that the controller is securely mounted in a clean and dry environment.
- Check that the air flow and ventilation around the controller is not blocked. Clear all dirt or fragments on the heat sink.
- Check fixings holding wiring in place.
- Check all wires to make sure insulation is not damaged from, UV exposure, frictional wear, moisture/corrosion, fatigue, insects or rats etc. Maintain or replace the wires if necessary.
- Make sure all terminal connections are tight. Inspect regulator connections for loose, corroded, broken, wires or signs of high temperatures such as discoloured or burnt areas.
- Confirm that all the system components are ground connected tightly and correctly if the system is grounded.
- Check that any fuses and fuse holders are not corroded and/or lose and/or warm or hot during operation. Replace as needed.

WARNING

Fatigued, weathered, loose and/or corroded wiring or electrical connections poses a fire risk even at low voltage. The systems wiring should be checked periodically for any wear, cracking resulting from UV damage of insulation on wiring and corrosion of any solder or controller connections. Any affected parts should be replaced at the first sign of damage.

10 Trouble Shooting Guide

Note: solar panels have no moving part and are extremely reliable. The only components that can fail are the diodes which can short out a panel and produce a 0V across the junction box terminals. The following is a step by step trouble shooting guide: