



110W Folding Solar Panel & Charge Controller User Manual



1. SAFETY/WARNING

SOLAR FOLDING KIT

- Before using the Solar Folding Battery Charger Kit ensure the instructions have been read and understood.
- The Solar Folding Battery Charger Kit is not intended for use by young children or infirm persons. Please keep away from pets.
- The Solar Folding Battery Charger Kit is designed to charge most 12 volt battery types including: Flooded (Lead acid), Gel and Sealed/Absorbed Glass Mat (AGM) batteries.
- Always wear the appropriate Personal Protective Equipment (PPE) when working near batteries. This includes gloves and eye protection.
- Ensure battery is being charged in a well-ventilated area. Explosive gases may escape from the battery during charging. Never charge a battery in a closed off space or in an area without ventilation.
- Never smoke, use an open flame or create sparks near a battery or charger whilst charging as gases may cause explosion. Please keep burning cigarettes, flames or other ignition sources away from the charging battery at all times.
- Do NOT attempt to use the Solar Folding Battery Charger Kit if the cables or plugs are damaged. These units **do not contain serviceable parts**. To avoid a hazard ensure that any damage to the unit, cable or plugs are replaced by the manufacturer or service agent/ qualified technician.
- Do NOT disassemble the Solar Folding Battery Charger Kit. The warranty will be void if this instruction is ignored.
- If battery is still connected in the vehicle, ensure vehicles ignition is switched off before charging the battery.
- Do NOT place the Solar Folding Battery Charger Kit on fabric/leather/vinyl seats, on the battery or balanced in the engine bay.

- Never charge a frozen battery, non-rechargeable, lithium or dry cell battery.
- The Ridge Ryder Solar Folding Battery Charger Kit may have sharp edges – please handle with care.
- Do NOT bend or scratch solar panels.
- Do NOT walk, sit or place heavy items onto the solar panels or the kit in the bag.
- Do NOT use the Solar Folding Battery Charger Kit in windy/gusty conditions. This may damage the panel and other property.
- Do NOT use a high pressure hose to clean the Solar Folding Battery Charger Kit. Use a clean microfiber cloth to clean panel surfaces.

REGULATOR

- Do NOT disassemble or attempt to repair the regulator.
- Power connections must remain tight to avoid excessive heating from a loose connection.
- Only charge 12V batteries that comply with the parameters of the regulator.
- Battery connection may be wired to one battery or a bank of batteries.
- Keep in a dry well-ventilated area, these regulators are NOT waterproof.

2. FIRST AID & BATTERIES

- If battery acid makes contact with the skin or clothing, wash immediately with soap and water.
- If battery acid makes contact with the eyes, hold eyelids apart and flush the eye continuously with fresh running water for at least 15 minutes or until the Poisons information centre advises you to stop.
- If battery acid is swallowed, do not induce vomiting. Drink a glass of water and seek medical assistance.

3. FEATURES & BENEFITS

SOLAR FOLDING KIT

- Mono-Crystalline solar panel
- Suitable for charging 12 volt batteries
- Ideal for caravanning, camping, boating and other outdoor activities
- Strong and dependable aluminium legs
- 10A 12V Regulator included
- Foldable design with carry bag

REGULATOR

- Support 3 charging options: Flooded (Lead acid), Gel and Sealed/ Absorbed Glass Mat (AGM) batteries.
- Battery status LED indicator indicates battery situation
- The USB will provide power supply that can charge small electronic devices
- Battery type and load output can be set via button
- Extensive Electronic protection
- o Battery Over Voltage Protection
When the battery voltage reaches to the set point of Over Voltage Disconnect Voltage(OVD),the regulator will stop charging the battery to protect the battery from being over charged.
- o Battery Over Discharge Protection
When the battery voltage reaches to the set point of Low Voltage Disconnect Voltage (LVD), the regulator will stop discharging the battery to protect the battery from being over discharged.
- o Load Overload Protection
Load will be switched off when 1.25 times rated current overload happens. User has to reduce load appliance, then press the button or restart the regulator.
- o Load Short Circuit Protection
Load will be switched off when load short circuit (≥ 3 times rated current)

happens. User has to clear short circuit, then press the button or restart the regulator.

- o High Voltage Transients Protection

The regulator is protected against small high voltage transients. In lightning prone areas, additional external suppression is recommended.

4. TECHNICAL SPECIFICATIONS

SOLAR FOLDING KIT

Part Number:	TPS-105-110F
Charger Type:	Solar
Rated Voltage:	12V
Max System Voltage:	1000V DC
Maximum Power (Pmax):	110W
Power Tolerance:	$\pm 5\%$
Maximum Power Voltage (Vmp):	17.9V
Maximum Power Current (Imp):	6.15A
Open Circuit Voltage (Voc):	21.5V
Short Circuit Current (Isc):	6.56A
Operating Temperature:	-40°C to 85°C
12v Battery Chemistry Types*:	Flooded (Lead acid), Gel & SEALED/AGM

*NOT SUITABLE FOR LITHIUM/DRYCELL / FROZEN/CALCIUM BATTERIES

REGULATOR

Nominal system voltage	12VDC
Rated charge current	10A
Rated discharge current	10A
Battery input voltage range	8V~16V
Max. PV open circuit voltage	30V
Self-consumption	12V \leq 5mA
Charge Circuit Voltage Drop	$\leq 0.13V$
USB Output Port	5VDC/1.2A
Working environment temperature	-35°C~+55°C
Humidity	$\leq 95\%$ N.C.
Mounting hole size	$\Phi 4.5$

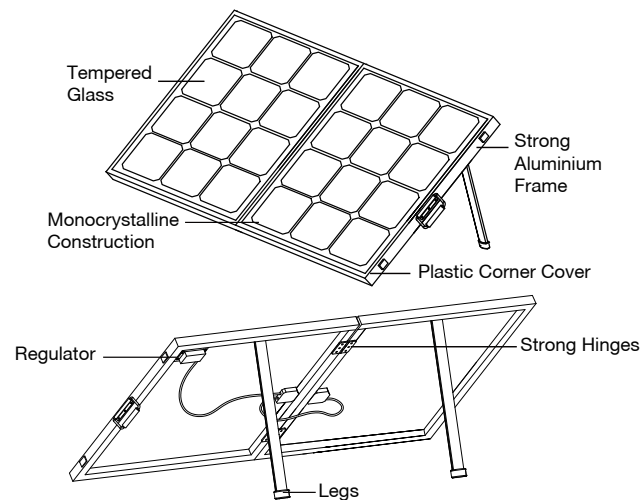
BATTERY VOLTAGE CONTROL PARAMETERS

- Below parameters are in 12V system at 25 C.

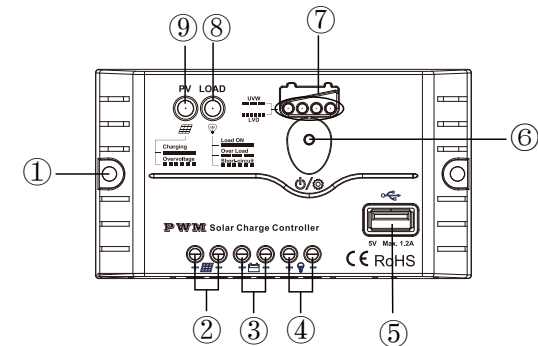
Battery Type	SEALED/AGM	GEL	FLOODED(LEAD ACID)
Over Voltage Disconnect Voltage	16.0V	16.0V	16.0V
Charging Limit Voltage	15.0V	15.0V	15.0V
Over Voltage Reconnect Voltage	15.0V	15.0V	15.0V
Equalize Charging Voltage	14.6V	-	14.8V
Boost Charging Voltage	14.4V	14.2V	14.6V
Float Charging Voltage	13.8V	13.8V	13.8V
Boost Reconnect Charging Voltage	13.2V	13.2V	13.2V
Low Voltage Reconnect Voltage	12.6V	12.6V	12.6V
Under Voltage Warning Reconnect Voltage	12.2V	12.2V	12.2V
Under Voltage Warning Voltage	12.0V	12.0V	12.0V
Low Voltage Disconnect Voltage	11.1V	11.1V	11.1V
Discharging Limit Voltage	10.6V	10.6V	10.6V
Equalize Duration	120Mins	-	120Mins
Boost Duration	120Mins	120Mins	120Mins

5. DIAGRAM/ PARTS LIST

SOLAR FOLDING KIT



REGULATOR



Regulator Features

①	Mounting Hole Φ 4.5	⑥	Button
②	PV Terminals	⑦	Battery status LED indicator
③	Battery Terminals	⑧	Load status LED indicator
④	Load Terminals	⑨	Charging status LED indicator
⑤	USB Output Port		

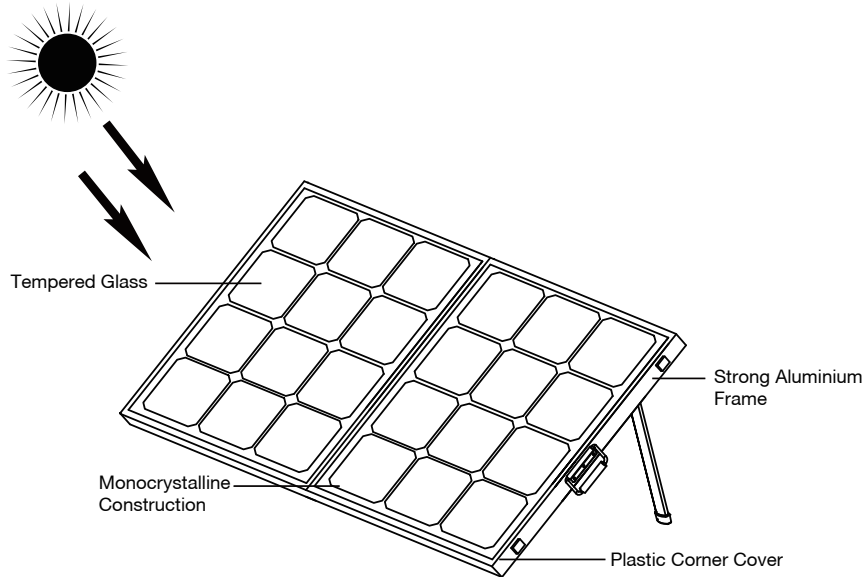
6. INSTALLATION GUIDE

Step 1.Placement of the Solar Panel Kit

Place the solar panel kit in a position where it is exposed to the most direct sunlight. Best results face the solar panel kit in a northerly orientation. Although the panel will function in the horizontal position, for best performance tilt the panel directly facing the sun.

Please Note: Always face the front side of solar panels toward the sun. To ensure maximum possible output, it is recommended that the Solar Panels are regularly moved to follow the sun's movement throughout the day and have been wiped down with a microfiber cloth.

Please Note: If using on new caravans, some have a diode fitted to prevent discharge (equalisation) with a car battery when the alternator is not operating. Folding kit will need to be connected directly to a battery.

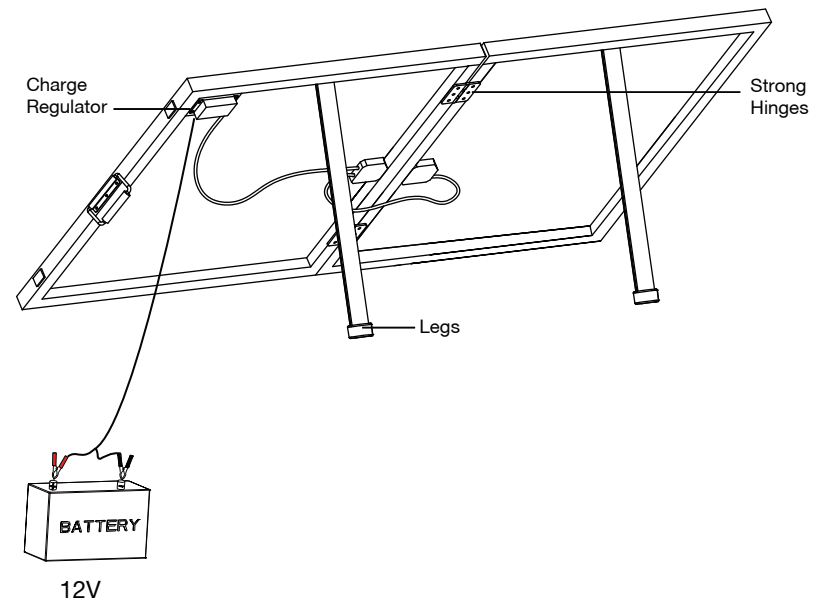


Step 2.Battery Connection

Connect the 5 meter lead to the 12V battery, Red clamp to the (+/Positive) terminal and Black clamp to the (-/Negative) terminal. The solar panel will now be charging the battery.

The Battery LED Indicator on the regulator will now be solid Green.
(If otherwise, refer to Step 3. LED Indicators or Step 4. Battery Status Indicator)

*For voltage requirements see Technical Specifications

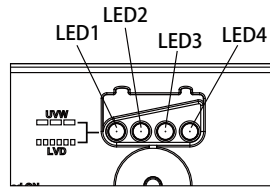


Step 3. LED Indicators

Indicator	Color	Status	Instruction
Charging status LED indicator	Green	On Solid	Charging
	Green	OFF	No Charging
	Green	Fast Flashing	Battery Over Voltage
Load status LED indicator	Green	On Solid	Load ON
	Green	OFF	Load OFF
	Green	Slowly Flashing	Load over load
	Green	Fast Flashing	Load short circuit

NOTE: Overcharge indicator light can also indicate when the battery is fully charged.

Step 4. Battery Status Indicator



LED1	LED2	LED3	LED4	Battery Status
Slowly Flashing	x	x	x	Under voltage
Fast Flashing	x	x	x	Over discharge
Battery LED indicator status during voltage is up				
○	○	x	x	$12.8V < U_{bat} < 13.4V$
○	○	○	x	$13.4V < U_{bat} < 14.1V$
○	○	○	○	$14.1V < U_{bat}$
Battery LED indicator status during voltage is up				
○	○	○	x	$12.8V < U_{bat} < 13.4V$
○	○	x	x	$12.4V < U_{bat} < 12.8V$
○	x	x	x	$U_{bat} < 12.4V$

NOTE: ①"○"LED indicator on; "x"LED indicator off.

Step 5. Setting Operation

(1) Load ON/OFF Setting

When the regulator is powered on, press the button to control the load output. NOTE: The USB will output when the load is on.

(2) Battery Type Setting

Operation:

Step 1: Enter setting mode by pressing button for 5 seconds until the battery status LEDs are flashing.

Step 2: Select the desired mode by pressing button.

Step 3: The mode will be saved automatically without any operation for 5 seconds and LED will stop flashing.

Battery Type Indicator

LED1	LED2	LED3	Battery type
○	x	x	SEALED/AGM
○	○	x	Gel
○	○	○	Flooded (Lead acid) (Default)

NOTE: "○"LED indicator on "x"LED indicator off

7. SPECIFICATIONS

SOLAR FOLDING KIT

Part Number:	TPS-105-110F
Charger Type:	Solar
12v Battery Clamps Length:	5 Meters
12v Cigarette Outlet Length:	Not Included
Frame Type:	Aluminium
Solar Panel	Mono-Crystalline

8. TROUBLESHOOTING

Problem /Indication	Possible Causes	Suggested Solution
No LED Indicator illuminated on regulator	Solar panel disconnection	Confirm that Solar panel and battery wire connections are correct and tight
No LED Indicator illuminated on regulator	Battery voltage maybe less than 8V	Measure battery voltage with the multimeter. Min.8V can start up the regulator
Charging status LED indicator flashing fast	Battery over Voltage	Check if battery voltage is higher than OVD, and disconnect the Solar panel
LED1 flashing fast	Battery over discharged	When the battery voltage is restored to or above LVR point(low voltage reconnect voltage), the load will recover
Load status LED indicator flashing fast	Load short circuit	①Check loads connection carefully and clear the fault. ②Press the button or restart the regulator.
Load status LED indicator slowly flashing	Load over load	①Please reduce the number of electric equipment. ②Press the button or restart the regulator.
Overcharge light is on	Battery is fully charged	The regulator will automatically cut off the charging circuit, do not need other actions.

9. FREQUENTLY ASKED QUESTIONS

Q. Are the Solar Folding Battery Charger Kit waterproof or water resistant?
A. Yes the kits are suitable for all weather conditions. The Regulator is NOT waterproof.

Q. Are the Solar Folding Battery Charger Kit suitable for lithium batteries?
A. No. Please see your local Supercheap Auto store for lithium battery chargers.

Q. Are the Solar Folding Battery Charger Kit suitable for 6/12/24Volt batteries?
A. No. The Solar Folding Battery Charger Kit is only suitable for 12volt Batteries.

Q. Can the Solar Folding Battery Charger Kit be left on the battery permanently?
A. No. It is recommended that the Solar Folding Battery Charger Kit is checked regularly. Leaving a battery on charge permanently may cause damage to your battery.