



# **120W 12V PORTABLE FOLDING SOLAR KIT**

**POWERFUL & PORTABLE 'BRIEF-CASE' STYLE KIT**

**Model No. KT70710**



## **IMPORTANT**

This manual contains important safety and operational instructions. Please read carefully before using this product.

## Warranty Guarantee

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This product carries an unconditional 3 Year Warranty against defects under the terms of the manufacturers warranty. Should the manufacturers warranty not comply with Australian Consumer Law, AECAA Pty Ltd Trading as Automotive Electrical & 4WD Accessories will provide a warranty against defects for 3 years from date of purchase on the following terms:

- a) For valid claims, Automotive Electrical & 4WD Accessories will replace the product free of charge.
- b) The warranty excludes defects from after sale damage, neglect, abuse, failure to comply with information provided in this manual, or incorrect installation. You bear all transportation costs to and from Automotive Electrical & 4WD Accessories.
- c) The Benefits of this warranty are in addition to any other rights and remedies available at law.
- d) Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality.

For warranty claims:

- a) Return the product with receipt and original packaging (if available) to the store in which the product was originally purchased.
- b) Email our team at [warranties@ae4a.com.au](mailto:warranties@ae4a.com.au) with details of the products defects and our team will assist with a resolution.

## Feedback

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KT Solar design and innovate our own products based on market and consumer demand, and always welcome any feedback on our products and services. If you would like to provide us feedback, you can do this by:

- a) Send our team an email at [marketing@ktcables.com.au](mailto:marketing@ktcables.com.au) or
- b) Follow our Facebook & Instagram Pages '@ktsolarus' and leave us a review
- c) Contact our team directly by phone:  
East Coast - QLD, NSW, ACT, VIC, TAS: (07) 5540 7877  
West Coast: WA, NT, SA (08) 9358 7000

We also welcome you to share any images you have of your installations on our social media pages (Facebook and Instagram).

To learn more about our services, visit [www.ktcables.com.au](http://www.ktcables.com.au).

Alternatively, to learn more about Automotive Electrical & 4WD Accessories, visit [www.ae4a.com.au](http://www.ae4a.com.au)



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**For your personal safety, please read, understand and follow the information provided in this instruction manual.**

Congratulations on your new & Innovative 120 Watt, 12V Portable Folding Solar Kit!

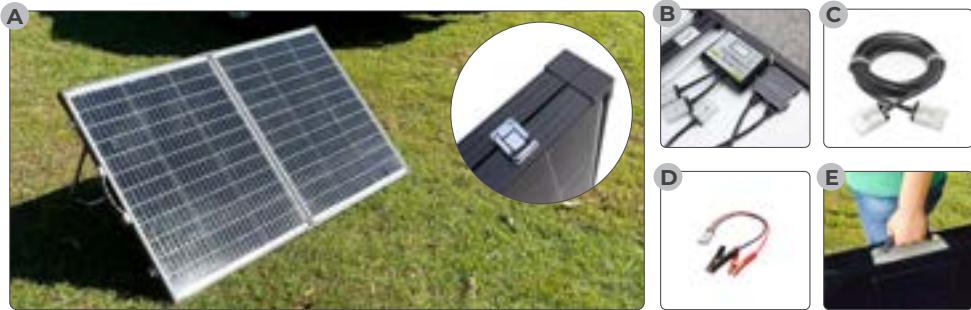
Designed to fold down to a convenient 710 x 510 x 65mm 'brief-case' style kit.

## Features

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- **Powerful 120W 12V Portable 'brief-case' style kit**  
With its efficient design, the Portable 120W, 12V Portable Folding Solar Kit is built to fit 120W into a compact 'brief case' style kit.
- **Lightweight, foldable design for easy transportation & Storage**  
Dimensions Folded (mm): 710(L) x 510(W) x 65(D)  
Dimensions Unfolded (mm): 1020(L) x 710(W) x 30(D)  
Total Weight: 9.50Kg
- **10 Amp 12V PWM Solar Charge Controller included**  
Solar controller is compatible with GEL, WET, AGM, CALCIUM & LITHIUM Batteries. Controller features reverse polarity, short circuit and over voltage protection.
- **Includes leads & accessories with sealed 50A connectors**  
1 x 10M Lead, 50Amp Extension lead for easy connection to power  
1 x Positive & Negative Alligator Clamps, 500mm Lead to Heavy Duty Connector
- **Sturdy construction for support and securing**  
Strong aluminium leg supports  
Quality stainless steel latches and hinges  
Controller is mounted to the panel supports, reducing de-rating from overheating  
Protective ABS corners  
Heavy Duty Swivel carry handle  
Heavy duty bag
- **Suitable for a wide-range of applications**  
Perfect for charging 12V batteries that power camping fridges, lighting, air-compressors & other 12V devices.
- **Black anodised aluminium frame**

## Components



- A** 2 x 60W solar cells configured in parallel (120W, 12V Portable 'brief-case' style kit)
- B** 10A, 12V PWM solar charge controller
- C** 1 x 10M, 50Amp extension lead
- D** 1 x Positive & Negative alligator clamp, 500mm lead to 50A, 12V connector
- E** Sturdy nylon bag with carry straps

## Operational Instructions

### 1. Step 1 - Unfold & position the kit in the sun

Locate the panel in a position where it is exposed to the sun for the majority of the day. For best results use a northern orientation. The panel will function in the horizontal or hung position, however for best performance tilt the panels so they directly face the sun.

### 2. Step 2 - Connect to the battery

Connect the 10M lead to the battery - red clamp to the positive (+) terminal and black clamp to the negative (-) terminal. The solar panel will now be charging the battery under regulation.

## Solar Kit Specifications

Type	Monocrystalline
Maximum Power (Pmax)	120Wp
Maximum Power Voltage (Vmp)	17.8V
Maximum Power Current (Imp)	6.74A
Open Circuit Voltage (Voc)	21.0V
Short Circuit Current (Isc)	7.74A
Operating Temperature	-40 to +85 Degrees Celsius
Product Application	Class A
Product Weight	9.50Kg
Dimensions Folded (mm)	710(L) x 510(W) x 65(D)
Dimensions Un-Folded (mm)	1020(L) x 710(W) x 30(D)
Power Tolerance	+3%

## Solar Controller Specifications

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Type	PWM
Operating Temperature	-20°C to +80°C
Operating Voltage	12V
Rated to (Amps)	10A
Rated to (Voltage)	12V
Battery Voltage	12V
Dimensions (mm)	100 (H) x 130 (W) x 28 (D)
Product Weight	1.20kg
Manufactured from material	Polycarbonate

The KT 10 Amp Solar Charge Regulator is designed to regulate the amount of charge coming from the panel that flows into the deep cycle battery in order to avoid batteries being overcharged.

KT's range of solar regulators are PWM (Pulse Width Modulation) which are the most commonly used, making them suitable for use on panels that are constantly being transported or moved eg; on the roof of a caravan, fitted to the back of a transportable, folding solar panel etc.

PWM solar chargers use technology similar to other modern high quality battery chargers. When a battery voltage reaches the regulation set-point, the PWM algorithm slowly reduces the charging current to avoid heating and gassing of the battery, yet the charging continues to return the maximum amount of energy to the battery in the shortest time. The result is a higher charging efficiency, rapid recharging, and a healthy battery at full capacity.

## Solar Controller Features

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- 10Amp, 12V Suitable for Solar Panels up to 150 Watts
- LCD Information Screen
- Selection modes for battery type and LCD screen Modes
- Advanced Pulse Width Modulation Technology (PWM)
- 6 LED's denote charging and battery status
- Suits AGM, Gel, Wet, Calcium & Lithium Batteries
- 100% no condensation - potted
- IP65 Rated (dustproof & splashproof)

## Solar Controller Diagram

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## Solar Controller Operation

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Step 1: Connect the battery. If the connection is correct, the controller screen lights up; otherwise, check whether the connection is correct.

Step 2: If sunlight is present and strong enough (the solar panel voltage is greater than battery voltage), the sun icon on the LCD screen is on; otherwise, check whether the connection is correct.

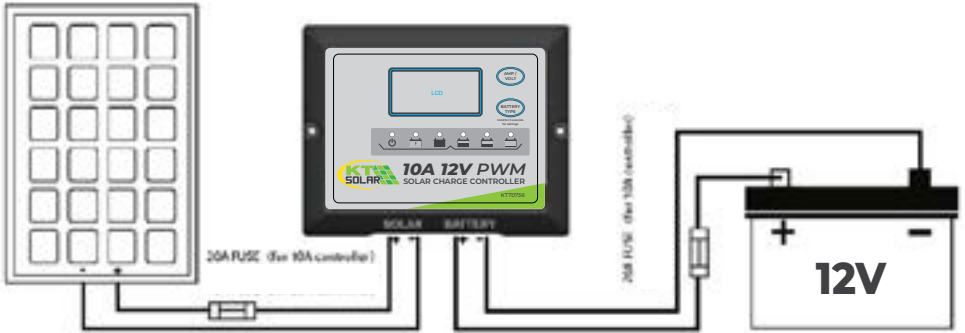
## Wiring Connections

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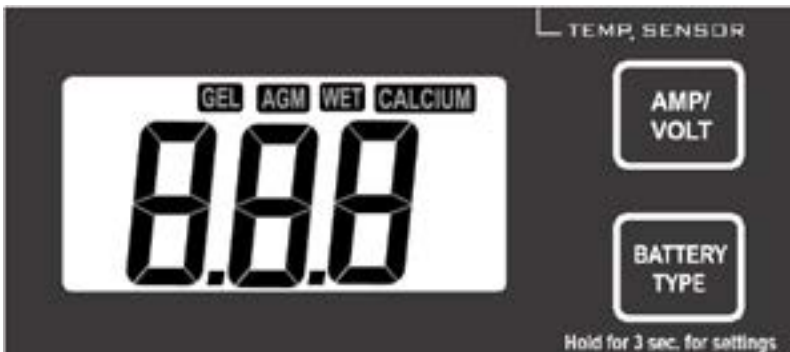
To protect the Battery and the Solar Panel, we strongly recommend that you place inline fuse on the positive wire on both the "Solar" and "Battery" Circuits. 20A fuse for 10A controller.

The Solar Controller has 4 terminals which are clearly marked 'Solar' and 'Battery'.

**Refer to the wiring diagram below.**



## Operation - LCD Display



Please check your battery manufacturer's specifications to select correct battery type. The unit provides 5 types for selections: Gel, AGM, WET (conventional lead acid), Lithium and Calcium.

Press BATTERY TYPE button and hold for 3 seconds to go into your battery type selection mode, the battery type you select will be shown on the LCD meter, the default setting is AGM Battery; the controller will automatically memorize your battery type setting.

**Caution:** Incorrect battery type setting may damage your battery.

When the controller powers on, the unit will run self-qualify mode and automatically show below items on LCD before going into charging process.

Self-test starts, digital meter segments test

Software version test

V

A

Rated voltage and current test

°C

External battery temperature sensor test (if connected)

After going into charging process, the LCD displays the charging states as below:  
Press VOLT / AMP button in sequence, the LCD will display in turn with Battery Voltage, Charging Current, Charged capacity (Amp-hour) and Battery Temperature (if external temperature sensor connected)

## Display in the day time-

## Display during the night

## Alternatively Display voltage and FUL when battery is fully charged

The VOLT / AMP button can be changed at any time during charging process.

The LCD also can be treated as an independent voltage meter or thermometer.

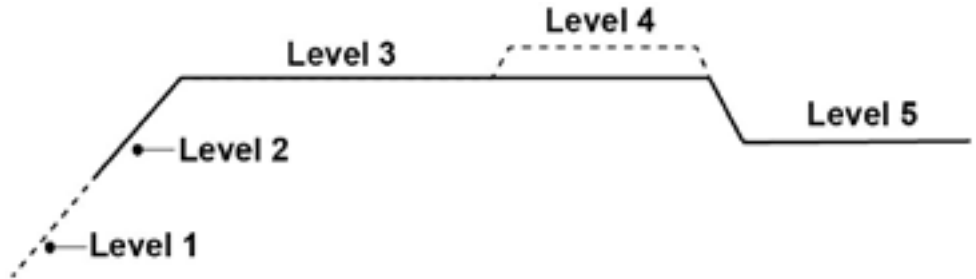
A voltage less than 11.5V Volts (for 12V battery) indicates that the battery is discharged and needs re-charging.



## CHARGING STAGES OPERATION - L.E.D. INDICATION

The unit has a 5 stage charging algorithm.

- Soft Charge (Level 1)
- Bulk Charge (Level 2)
- Absorption charge (Level 3)
- Equalizing Charge (Level 4)
- Float Mode (Level 5)



## CHARGING STAGES

**Soft Charge** - When batteries suffer an over-discharge, the controller will softly ramp the battery voltage up to 10V for 12V battery.







**Bulk Charge** - Maximum current charging until batteries rise to Absorption level

**Absorption Charge**-Constant voltage charging and battery is over 85%.

**Equalisation Charge\*** -Only for WET battery or Calcium battery type, when the battery is deeply drained below 10V (for 12V battery), it will automatically run this stage to bring the internal cells as an equal states and fully complement the loss of capacity.(Gel and AGM battery do not run Equalization charge)






**Float Charge** - Battery is fully charged and maintained at a safe level. A fully charged battery has a voltage of more than 13.6 Volts (for 12V battery).

## OPERATION - L.E.D. INDICATION

The 6 LED's indicate the charging status and the battery condition						
	Red	Blue	Green	Green	Yellow	Red
Solar Power Present-No battery connected	ON	OFF	OFF	OFF	OFF	Flash
Soft charging	ON	Flash	OFF	OFF	OFF	ON
Bulk charging	ON	ON	OFF	Subject to battery voltage		
Absorption charging	ON	ON	OFF	ON	OFF	OFF
Equalization charging	ON	ON	OFF	ON	OFF	OFF
Float charging	ON	OFF	ON	OFF	OFF	OFF
Solar panel weak	Flash	OFF	OFF	Subject to battery voltage		
At night no charge	OFF	OFF	OFF	Subject to battery voltage		
Battery Voltage below 11.5V (+/-0.2V)	ON	ON	OFF	OFF	OFF	ON
Battery Voltage between 11.5V - 12.5V(+/-0.2V)	ON	ON	OFF	OFF	ON	OFF
Battery Voltage above 12.5V (+/-0.2V)	ON	ON	OFF	ON	OFF	OFF

Values are for 12V use.

## ABNORMAL OPERATION MODE

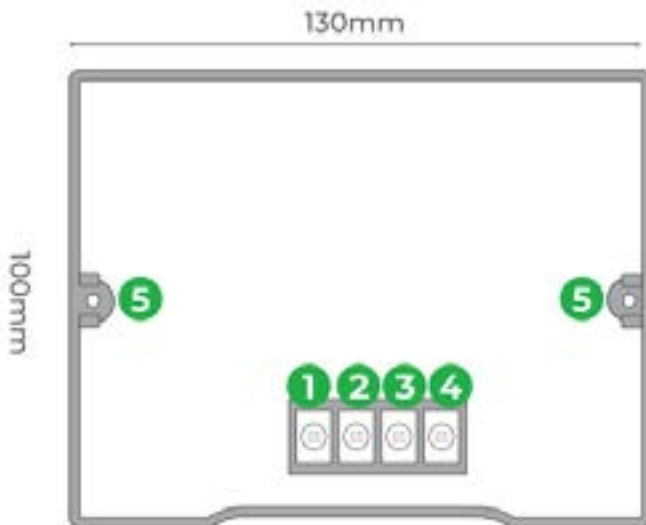
Solar panel abnormal mode	LCD display	LED indication	LCD backlight
Solar panel weak		 Flash	ON
Solar panel reverse connection		 Flash	Flash
Solar panel over voltage (> 28.5V)		 Flash	Flash

Battery abnormal mode	LCD display	LED indication			LCD backlight
Battery disconnected or less than 3.0V	800	Flash	Flash	Flash	Flash
Battery reverse connection	802	Flash			Flash
Battery over voltage than > 17.5V	803	Flash			Flash
Battery temperature over 65C	808	Flash	Flash	Flash	Flash

The solar controller abnormal mode	LCD display	LED indication	LCD backlight
The controller over temperature protection	888		Flash

## OPTIONAL EXTERNAL DEVICE

The controller provides an optional device (excludes in the packaging box).



### KEY

1. Battery (-)
2. Battery (+)
3. Solar Cell (-)
4. Solar Cell (+)
5. Mount Points

## SPECIFICATIONS

<b>1</b>	<b>Electrical Parameters</b>			
1-1	Rated solar panel amps	10	Max.	AMP
1-2	Normal input Solar cell array voltage	15-22		VDC
1-3	Max. solar cell array voltage (output has no load)	25	Max.	VDC
1-4	The controller lowest operating voltage at solar or battery side	8V	Min	VDC
1-5	Standby current consumption at night	5	Max	mA
1-6	Maximum voltage drop-Solar panel to battery	0.25	Max.	VDC
<b>2</b>	<b>Charging characteristics</b>			
2-1	Minimum battery start charging voltage	3	Min	VDC
2-2	Soft start charging voltage	3-10	+/-0.2	VDC
2-3	Soft start charging current (50% PWM duty)	Up to 15		AMP
2-4	Bulk charge voltage	10-14.0	+/-0.2	VDC
2-5	Absorption charging voltage at 25°C			
	--Gel type battery	14.1	+/-0.2	VDC
	--AGM type battery (default setting)	14.4	+/-0.2	VDC
	--WET type battery	14.7	+/-0.2	VDC
	--Calcium type battery	14.9	+/-0.2	VDC
2-6	Absorption transits to Equalizing or Float condition:			
	--Charging current drops to	0.5	+0.1	AMP
	-- or Absorption charging timer timed out	4		Hour
2-7	Equalization charging active			
	--Only for WET or Calcium battery			
	--Battery voltage discharged to less than	10	+/-0.2	VDC
	--Automatic equalizing charging periodical	28		Day
2-8	Equalization charging voltage at 25°C	15.5	+/-0.2	VDC
2-9	Equalization charging timer timed out	2		Hour
2-10	Float charging voltage at 25°C	13.6	+/-0.2	VDC
2-11	Voltage control accuracy	+/- 1%		
2-12	Battery temperature compensation coefficient	-24		mV/°C
2-13	Temperature compensation range	-20 ~ +50		°C
<b>3</b>	<b>Protection</b>			
3-1	Against reverse polarity or short circuit			
3-2	No reverse current from battery to solar at night			
3-3	Over temperature protection during charging	65		°C
<b>4</b>	<b>Electrical parts</b>			
4-1	Input output terminal	M5 terminals		
4-2	Temperature sensor port (Press and Release type)	DA 250-350 2P		
<b>5</b>	<b>Physical Parameters</b>			
5-1	Controller material	Plastic, Standard ABS		
5-2	Power terminal maximum stranded wire size	#12 AWG stranded-3 mm <sup>2</sup>		
5-3	Mounting	Vertical wall mounting		
5-4	IP grade	IP22 or IP65		
5-5	Net weight	Approx. 300g		
<b>6</b>	<b>Environmental characteristics</b>			
6-1	Operating temperature	-25 ~ 50°C		
6-2	Storage temperature	-40 ~ 85°C		
6-3	Operating Humidity range	100% no condensation		

Values are for 12V use.

## Product Care

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1. Periodically inspect the electrical and mechanical connections. Make sure they are all tight and free from corrosion. If necessary clean the surface of the solar panels with a soft damp cloth. Mild detergent can also be used. Any dirt or residue on the solar mat may effect performance.
2. Always fold-away for storage when not in use

## Product Safety

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Always follow user manual for operational and safety instructions.

1. For installations with all batteries, avoid sparks or flames near the batteries and always use proper eye protection.
2. Given sufficient light, solar panels always generate energy even when they are disconnected.
3. Accidental 'shorting' of the terminals or wiring can result in sparks causing personal injury or a fire hazard.
4. Do not scratch or stand on solar panels.
5. Do not disassemble the Solar kit.
6. Do not attempt to increase module output by concentrating light on its surface with mirrors.
7. When storing the KT Solar kit - to avoid damage, do not pack heavy items on top.
8. Do not disassemble the controller. Take to a qualified electrician if the unit requires repairing.
9. Solar Regulator is IP65 Rated, however all care must be taken to ensure wiring is not exposed to moisture.