



Connecting Through Innovation!

OPERATION & SAFETY MANUAL

**KT 300W, 12V SOLAR BLANKET KIT
WITH 20A, 12V SOLAR CHARGE CONTROLLER**
MODEL NO. KT70723



Safety Warnings

- For installations with Lead-Acid, LiFePO4 and LTO (Lithium Titanium Oxide) batteries, avoid sparks or flames near the batteries and always use proper eye protection.
- Given sufficient light, solar panels always generate energy even when they are disconnected.
- Accidental 'shorting' of the terminals or wiring can result in sparks causing personal injury or a fire hazard.
- Do not scratch or bend solar panels.
- Do not disassemble the Solar Blanket.
- When mounting solar panels at a height, adhere to all relevant safety regulations.
- Do not walk on modules.
- Do not attempt to increase module output by concentrating light on its surface with mirrors.
- Be sure to use components (cables, fuses, etc) greater than 25% of the Solar Blanket's maximum current ratings.
- When storing the KT Solar Blanket Kit - to avoid damage, do not pack heavy items on top.
- Do not disassemble the controller. Take to a qualified electrician if the unit requires repairing.
- Blanket is not to be exposed to inclement weather or excess moisture.
- Solar Regulator is IP65 Rated, however all care must be taken to ensure wiring is not exposed to moisture.

Feature Overview

Compact and Powerful: Monocrystalline Solar Panels are manufactured from a solar cell that is cast from silicon. These cells are more efficient at producing power than most other solar panels, allowing the panel to be smaller in size yet product a greater power output.

Lightweight, Foldable Design: Folds down to 390mm x 380mm x 140mm for easy storage.

Scratch Resistant: Panels feature a scratch resistant matte coating for durability.

5M Lead & Battery Clamps: The fused battery lead makes for trouble free battery connection. All Leads are stored in the front pocket of the bag.

Heavy Duty Material: Tough material suitable for camping and off-road environments.

Specification Overview

Max Power (Pmax)	300Wp
Max Power Voltage (Vmp)	18.8V
Max Power Current (Imp)	15.95A
Open Circuit Voltage (Voc)	22.15V
Short Circuit Current (Isc)	16.42A
Dimensions Folded	390mm x 280mm x 140mm
Dimensions Unfolded	1140mm x 1970mm x 5mm
Test Conditions	AM1.5, 25°C, 100Wm ²
Fuse	20A
Battery Connections	Battery Clamps
Weight	8.85Kg
Product Application	Class A
Solar Controller Type	PWM 20A Solar Controller

IMPORTANT WARNING

IT IS RECOMMENDED NOT TO PLACE YOUR SOLAR BLANKET OVER VEHICLES PAINT-WORK. HUMIDITY CAN CAUSE THE BLANKET TO STICK TO PAINT-WORK.

SOLAR BLANKETS ARE UNLIKE TEMPERED GLASS FOLDING KITS. THEY HAVE A THICK CANVAS MATERIAL STITCHED IN BEHIND THE SOLAR CELLS. YOUR KT SOLAR BLANKET SHOULD BE FOLDED UP AND STORED IN A DRY PLACE AT NIGHT WHILST CAMPING.

TRY TO AVOID PLACING ON WET GRASS DURING EARLY MORNING SUNLIGHT AND SELECT A DRY SURFACE FOR THE BLANKET TO BE PLACED, UNLESS SUSPENDING OR FOR WINDSCREEN APPLICATION.

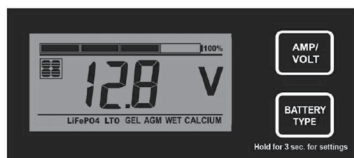
Solar Charge Controller - 20A, 12V PWM Solar Controller



- Advanced MCU control Pulse Width Modulated (PWM) technology, high efficiency operation.
- Suitable for LiFePO₄, LTO (Lithium Titanium Oxide), Gel, AGM, Conventional Lead-Acid (WET) and Calcium Batteries.
- KT Solar Blanket features built-in regulator to prevent your battery from being overcharged. Overcharging occurs when the charge voltage is unregulated. This can result in premature battery failure.
- The regulator prevents your battery from being under charged. In the solar energy field, battery undercharge always occurs, especially on some conventional Lead-Acid or Calcium batteries.
- The unit provides an automatic equalisation feature for deeply drained conventional Lead-Acid or Calcium batteries, as well as providing a cycling automatic equalising feature every 28 days.
- Can be connected to the battery permanently to keep the battery fully charged using a process called 'floating'. This means that the controller will stop charging when the battery is full and will automatically start charging the battery as required. This process will also reduce water loss and help prevent the battery from 'drying out'.
- Protects your battery from discharge at night. Under low light or no light conditions the Solar Panel voltage could be less than the battery voltage. The unit contains a special circuit which prevents current flowing back from the battery and into the solar panel.
- Coloured LED's to indicate the operational status and battery conditions.
- Digital LCD to directly display battery voltage, charging current, charging capacity (Amp-Hour), battery types, full charge and faulty codes.
- Multi-charging protections against reverse polarity, short circuit, over temperature, over voltage, etc.

Operation - LCD Display

Please check your battery manufacturers specifications to select the correct battery type. The unit provides 6 battery types for selection: LiFePO₄, LTO, Gel, AGM, Wet (Lead-Acid) and Calcium.



CAUTION:
INCORRECT BATTERY
TYPE SETTING MAY
DAMAGE YOUR
BATTERY.

Press BATTERY TYPE button and hold for three seconds to enter the battery type selection mode. The battery type selected will automatically be shown on the LCD display. The default setting is AGM battery. The controller will automatically memorise your battery type setting.

When the Solar Charge Controller is turned 'on', the unit will run self-qualify mode and automatically show items on LCD before going into the charge process (Fig. 1.). After going into charging process, the LCD will display the charging status' below (Fig. 2.).

Press AMP/VOLT button in sequence to display the battery voltage, charging current, charged capacity (Amp-Hour) and battery temperature (if external temperature sensor is connected).

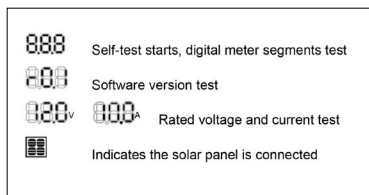


Fig. 1.

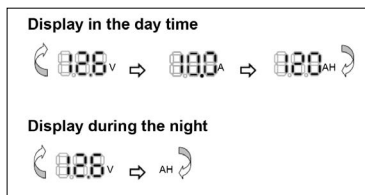


Fig. 2.

You can visually monitor your battery charging condition for each battery. There is an LCD bar to display the percentage of charge. You can easily see if the battery is charged to 25%, 50% or 100% (Fig. 3.).

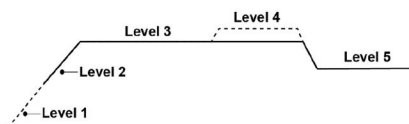


Fig. 3.

The AMP/VOLT Button can be changed at any time during the charge process.

The LCD Display also can be treated as an independent voltage meter or thermometer. A voltage less than 11.5V indicates that the battery is discharged and needs recharging.

Charging Stages



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

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 or Calcium battery type. When the battery is deeply drained below 10V, it will automatically run this stage to bring the internal cells to an equal state and fully complement the loss of capacity. (LiFePO₄, LTO, Gel & AGM battery do not run equalisation charge).

Float Charge: Battery is fully charged and maintained at a safe level. A fully charged Lead-Acid Battery (GEL, AGM, WET) has a voltage of more than 13.6V, A fully charged LiFePO₄ or LTO battery has a voltage level of 13.4V.

OPERATION - LED INDICATION

The 6 LEDs 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

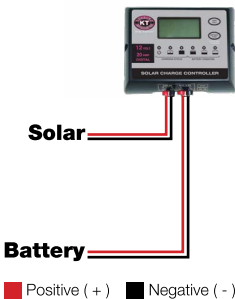
ABNORMAL OPERATION MODE

Solar panel abnormal mode	LCD display	LED indication	LCD backlight
Solar panel weak		FLASH	ON
Solar panel reverse connection	801	FLASH	FLASH
Solar panel over voltage (>26.5V)	802	FLASH	FLASH

Battery abnormal mode	LCD display	LED indication	LCD backlight
Battery disconnected or less than 3.0V	801	FLASH	FLASH
Battery reverse connection	802	FLASH	FLASH
Battery over voltage (>17.5V)	803	FLASH	FLASH
Battery temperature over 65°C	804	FLASH	FLASH

Solar controller abnormal mode	LCD display	LED indication	LCD backlight
Controller over temperature protection	805		FLASH

INSTALLATION & CONNECTION



Step 1 - Locate the panel in the best position.

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.

Step 2 - Connect to the battery

Connect the 5M 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.

Included in the Kit



300W Solar Blanket conveniently folds into a transportable bag.

20A, 12V Solar Charge Controller with 180mm cable length (2.5mm² Twin Core Cable).

5M Power Lead with 50A Heavy Duty Connections (2.5mm² Twin Core Cable).

55cm Power Lead to Positive & Negative Battery Clamps & 20A In-Line Fuse (2.5mm² Twin Core Cable).

Operation & Safety Manual

Maintenance

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 Panels may effect performance.

Frequently Asked Questions

Can the Solar Blanket be mounted on a flat roof or wall?

Yes, it is fine to mount the KT Solar Blanket on a horizontal surface such as a vehicle roof or on a vertical surface such as a wall, as long as the panel receives full sun for a reasonable period of the day. You will gain optimal performance if the panel is tilted toward the sun and faced in a northerly direction. Placing the panel in this position enables the maximum amount of solar energy to reach the panel.

What current output can I expect?

The current output (A) of the Solar Blanket is based mostly on the available solar energy (sun rays). The current ratings (Peak Power) given in the specifications table are based on the 'ideal' sunlight conditions. In reality this may achieved only on a very bright sunny day. The normal current output will therefore be a little lower. If the panel is shaded or if it is a very hot day the output will decrease further.

Will it charge my flat battery and how long will it take?

Yes, the KT Solar Blanket Kit will charge a flat battery (above 9V) 250-1800CCA (Automotive) with a charge depending on battery size.

Solar Charge Controller Specifications

1	Electrical Parameters			
1-1	Rated solar panel amps	10/15/20	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
2	Charging characteristics			
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
3	Protection			
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
4	Electrical parts			
4-1	Input output terminal	M5 terminals		
4-2	Temperature sensor port (Press and Release type)	DA 250-350 2P		
5	Physical Parameters			
5-1	Controller material	Plastic, Standard ABS		
5-2	Power terminal maximum stranded wire size	#12 AWG stranded-3 mm ²		
5-3	Mounting	Vertical wall mounting		
5-4	IP grade	IP22 or IP65		
5-5	Net weight	Approx. 300g		
6	Environmental characteristics			
6-1	Operating temperature	-25 ~ 50°C		
6-2	Storage temperature	-40 ~ 85°C		
6-3	Operating Humidity range	100% no condensation		

Remarks: Values are for 12V use, x 2 for 24V use

Warranty Statement

Only applicable to products sold in Australia.

AECAA Pty Ltd offers a warranty against defect and certifies that under normal use of the KT 300W, 12V Solar Blanket Kit as described in this operations & safety manual, this warranty is provided against failures in material and on workmanship for a period of two (2) years from the date of purchase.

This warranty does not cover ordinary wear and tear, abuse, alteration of products or damage caused by the consumer.

To make a warranty claim the consumer must deliver the product at their cost to the original place of purchase or to any other place which may be nominated by either AECAA Pty Ltd or the retailer from where the product was bought in order that a warranty assessment may be performed. The consumer must also deliver the original invoice evidencing the date and place of purchase together with an explanation in writing as to the nature of the claim.

In the event that the claim is determined to be for a minor failure of the product then AECAA Pty Ltd reserves the right to repair or replace it at its discretion. In the event that a major failure is determined the consumer will be entitled to a replacement during the warranty period.

This warranty is in addition to any other rights or remedies that the consumer may have under State or Federal legislation.



Automotive Electrical & 4WD Accessories

East Coast Head Office: 07 5540 7877 | sales.ec@ae4a.com.au West Coast: 08 9358 7000 | sales.wc@ae4a.com.au



www.ae4a.com.au @ae4aau

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www.ktcables.com.au

