OPERATION & SAFETY MANUAL

Connecting Through Innovation!

KT 150W, 12V SOLAR BLANKET KIT WITH 15A, 12V SOLAR CHARGE CONTROLLER

Model No. KT70712

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 panel.
- 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 solar panel's maximum current ratings.
- When storing the Solar panel kit do not pack heavy items on top the Solar panel and bag.
- Do not disassemble the controller. Take to a qualified person if the unit requires repairing.

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 panels, so the size of the panel is smaller yet produces greater output power.
- Lightweight, Foldable Design – Folds down to 375mm x 300mm for easy storage.
- Scratch Resistant – Panels feature a scratch resistant mat coating for durability.
- 5m Lead & Battery Clips – Fused battery lead makes for trouble free battery connection. Stored in front pocket of the bag.
- Heavy Duty Material – Tough material suitable for camping and off-road environments.

Model	Model No. KT70712
Type	Monocrystalline
Maximum Power	150W
Maximum Power Voltage	18.0V
Maximum Power Current	8.33A
Open Circuit Voltage	21.0V
Short Circuit Current	8.74A
Dimensions (Folded)	375x300x85mm
Test Conditions	AM1.5, 25°C, 1000W/m^2
Fuse	15.0A
Battery Connections	Battery Clamps
Weight	6.3kg

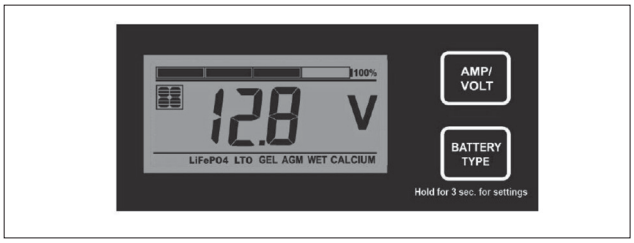
SOLAR CHARGE CONTROLLER

- 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.
- 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 equalization feature for deeply drained conventional lead-acid battery or calcium battery, as well as provides a cycling automatic equalizing feature every 28 days.

- Can be connected to the battery permanently to keep the battery fully charged by using a process called “floating”. This means 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 easily 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

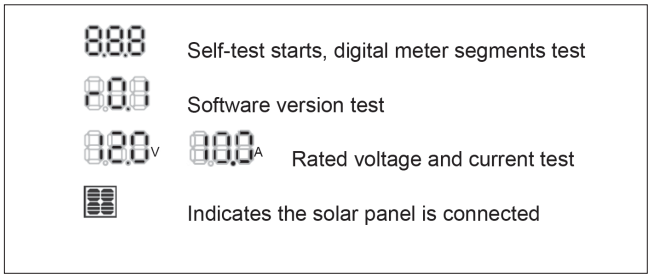
Please check your battery manufacturers specifications to select the correct battery type. The unit provides 6 battery types for selections: LIFEP04, Lithium Oxide, GEL, AGM, WET (LEAD-ACID) AND CALCIUM.



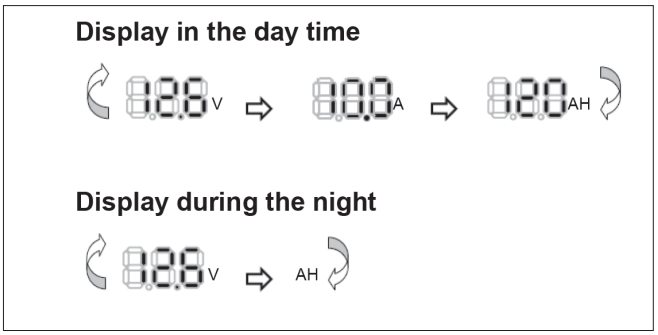
Press BATTERY TYPE button and hold for three seconds to enter the battery type selection mode. The battery type selected will automatiically be shown on the LCD display. The default setting is AGM battery. The controller will automatically memorise your batttery type setting.

Caution: Incorrect battery type setting may damage your battery.

When the solar charge controller is turned ‘On’, the unit will run self-qualify mode and automatically show items on LCD before going into charge process.



After going into charging process, the LCD will display the charging status’s below. 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).

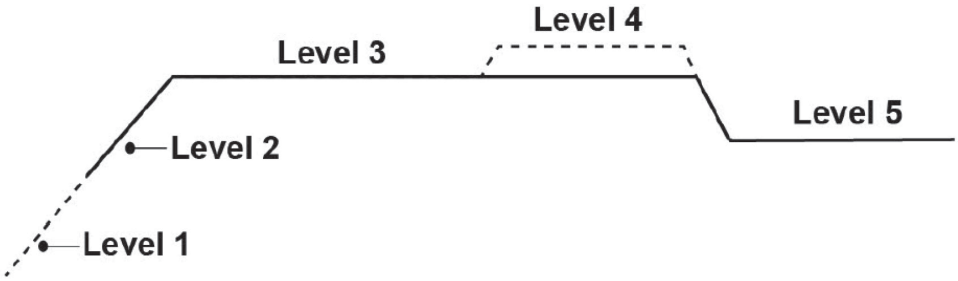


You can visually monitor your battery charging condition for each battery. There is an LCD bar to display the percentage of charge. You can easily see if the battery is charged to 25%, 50%, 75% or 100%.

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%.
- Equalization Charge: Only for WET battery or Calcium battery type, when the battery is deeply drained below 10V, it will automatically run this stage to bring the internal cells as an equal states and fully complement the loss of capacity. (LiFePO4, LTO, Gel and AGM battery do not run equalization charge)
- Float Charge: Battery is fully charged and maintained at a safe level. A fully charged Lead acid battery (GEL, AGM, WET battery) has a voltage of more than 13.6Volts. A fully charged LiFePO4 or LTO battery has a voltage level of 13.4 Volts.

OPERATION - LED INDICATION

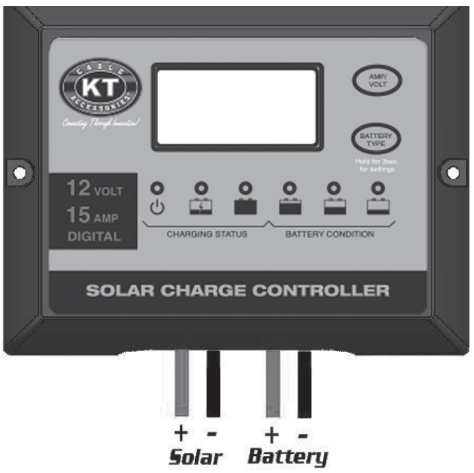
The 6 LEDs indicate the charging status and the battery condition	Red	Blue	Green	Green	Yellow	Red
Solar power present - No battery connected	**ON**	OFF	OFF	OFF	OFF	**FLASH**
Soft charging	**ON**	**FLASH**	OFF	OFF	OFF	**ON**
Bulk charging	**ON**	**ON**	OFF	Subject to battery voltage		
Absorption charging	**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		FLASH	FLASH
Solar panel over voltage (>26.5V)		FLASH	FLASH

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

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



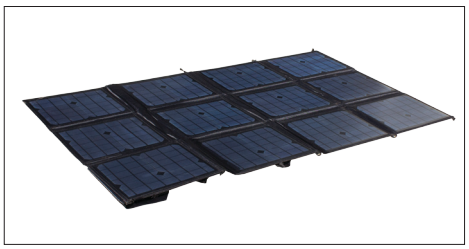
INSTALLATION & CONNECTION_

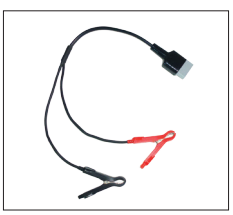
STEP 1: Locate the panel in the best position
Locate the panel in a position where it is exposed to the sun for the majority of the day. For best results use a northern orientation. The panel will function in the horizontal or hung position, however for best performance tilt the panels so they directly face the sun.

STEP 2: Connect to the battery
Connect the 5 metre 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. Refer to Solar Controller Instructions, 'Operation – LED Indication' (page 4) for further details of charging status.

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 PVC may effect performance.





FREQUENTLY ASKED QUESTIONS_

Can the solar panel be mounted on a flat roof or wall?

Yes. It is fine to mount the panel on a horizontal surface such as a roof or on a vertical surface like a wall as long as the panel receives full sun for a reasonable period of the day. You will however gain better performance if the panel is tilted toward the sun and faced in a northerly direction, since this enables the maximum amount of solar energy to reach the panel.

What current output can I expect?

The current output (A) of the solar panel 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 be 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 & how long will it take?

The KT Solar Blanket kit will charge a flat battery (above 9V) 250-1800CCA (Automotive) with a charge depending on battery size.

WARRANTY STATEMENT_

Applicable only to products sold in Australia
AECAA Pty Ltd warrants that the KT Solar Blanket Kit will under normal use and failures in material and workmanship for a period of one (1) year from the date of the consumer as marked on the invoice.

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.

SOLAR CHARGE CONTROLLER SPECIFICATIONS

Electrical Parameters	
Rated solar panel Amps for regulator	15Amp
Normal input Solar cell array voltage	15-22VDC
Max. solar cell array voltage (output has no load)	25VDC
The controller lowest operating voltage (at solar or battery side)	8VDC
Standby current consumption at night	5mA Max
Maximum voltage drop - Solar panel to battery	0.25VDC
Charging Characteristics	
Minimum battery start charging voltage	3VDC
Soft start charging voltage	3-10VDC +/-0.2
Soft start charging current (50% PWM duty)	5Amp
Bulk charge voltage	10-14VDC +/-0.2
Absorption charging voltage at 25°C	
• LTO type battery	14.0VDC +/-0.2
• Gel type battery	14.1VDC +/-0.2
• LiFePO4 battery	14.4VDC +/-0.2
• AGM type battery (default setting)	14.4VDC +/-0.2
• WET type battery	14.7VDC +/-0.2
• Calcium type battery	14.9VDC +/-0.2
Absorption transits to Equalizing or Float condition	
• Charging current drops to	0.5Amp +/-0.1
• or Absorption charging timer timed out	4 Hours
Equalization charging active (Only for WET or Calcium battery)	
• Battery voltage discharged to less than	10VDC +/-0.2
• Automatic equalizing charging periodical	28 Days
Equalization charging voltage at 25°C	15.5VDC +/-0.2
Equalization charging timer timed out	2 Hours
Float charging voltage at 25°C	
• For LTO and LiFePO4 battery	13.4VDC +/-0.2
• For Gel, AGM, WET, Calcium battery	13.6VDC +/-0.2
Voltage control accuracy	+/- 1%
Battery temperature compensation coefficient	-24 mV/°C
Temperature compensation range	-20 to +50°C
Protection	
Against reverse polarity or short circuit	
No reverse current from battery to solar at night	
Over temperature protection during charging	65°C
Electrical parts	
Input output terminal	Anderson terminals
Temperature sensor port (Press and Release type)	DA 250-350 2P
Physical Parameters	
Controller material	Plastic, Standard ABS
Power terminal maximum stranded wire size	#12 AWG stranded-3 mm^2
Mounting	Vertical wall mounting
IP grade	IP65
Net weight	Approx. 300g
Environmental characteristics	
Operating temperature	-25 to 50°C
Storage temperature	-40 to 85°C
Operating Humidity range	100% no condensation