

Product comparison Solarlight.co.za

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**AxxxxA 20W** (Other Solutions)

**SOLARLIGHT.CO.ZA**



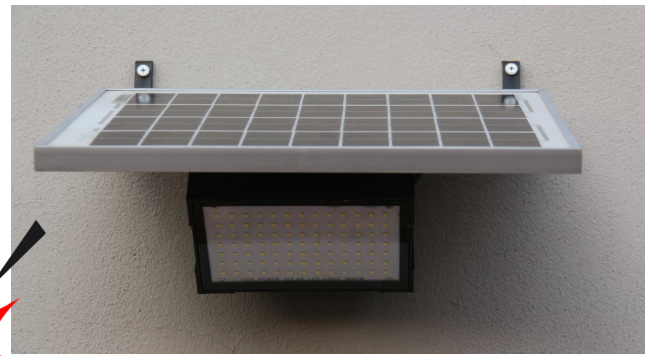
The South African market is flooded with cheap unreliable solar powered LED lights, it has become an impossible exercise, deciding on what solar powered LED light to purchase due to the large confusing amount of products.

The components used inside solar LED lights are directly related to global pricing like, Lithium Ore, Silica for the PV panel, aluminium, copper and even phosphor. The cost in manufacturing solar powered LED lights is directly related to the amount of raw materials that is used during the manufacturing process of such a light.

Therefore the easiest way to reduce cost in a solar powered LED light is to reduce the largest and most expensive component the Lithium-Ore portion. But reducing the Lithium-Ore will reduce the storage capacity and this will coincide with lower light outputs. An creative approach is then to lower the light output and time. This “tricking” make consumer to believe they have a high quality product. It seems like users have started to accept the performance and lower light output from solar powered LED lights probably soothing the purchase, as some light is better than no light.

The overall quality experience of the cheaper lights, the way it looks and the way it is manufactured can not be faulted. One can not prevent yourself in thinking more is better. But unfortunately quality and quantity are two world apart. A bigger LED light does not mean it will perform better, it is unfortunately the items you cant see that contribute to the quality, like the internal hosted battery.

The “tricking” and quality manifest in the packaging where detailed specifications are lacking making it impossible to compare to higher priced products in the market.



**Other Cheap Solutions**

**SolarLight.co.za**

**12.5Wh—3.2V Lithium 1000**

**Internal Battery**

**40Wh —3.2V Lithium 3500 Cycles**

Cycles **✗**

Upgradable to 80Wh **✓**

43 x Unknown LED chips **✗**

**CHIP SETS**

91 x High Quality Lumi-LED's **✓**

No **✗**

**Maximum Power Point Tracking**

YES **✓**

No **✗**

**Over-Under Charge Protection**

YES **✓**

No **✗**

**Constant Current LED Driver**

YES **✓**

6W **✗**

**Solar Power Panel Size**

10W **✓**

3W **✗**

**Solar Power Conversion Watts**

10W **✓**

**Into Battery**

No **✗**

**Multiple mounting structure**

Yes **✓**

## Integrated LED

It is difficult to understand the benefit of this statement. It refers to the PCB hosting the charger and LED driver on one PCB. This reduce the manufacturing cost drastically. However this design are not ideal for increased charger cooling and MPPT charge efficiency. Usually theses integrated PCB reduce component count that helps to reduce cost.



## Ingression Protection

This is perfect and it relate to how good the product is sealed to the environment.



## LED Light dispersion

Indicate that the light viewing angle is 120 degrees. Because the LED PCB is located deep inside the enclosure, the design need to reflex the light from deep inside the housing to the outside. By making use of an aluminium reflector passive light exit the Solar Light but with a limited viewing angle of 120 degrees. This design contribute to slightly more forward light propagation but less over-all light, to the side.



## 20W

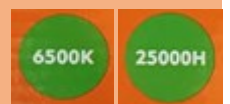
There is no explanation what is 20W in this light. Not possible to reach this power if it is related to power.

SOLAR LED FLOODLIGHT  
20W

## 25000 Hours

This mention that the LED chipset are design to work for 25000 hours and still be able to provide a certain percentage of light efficiency over the light output in lumens.

The 6500K refers to the colour of the LED chipset. Yellow Light is Lower and Blue light is climbing in Kelvin (K) 6500K is a very blueish colour this will increase Glare with very poor quality light. Blue light seems to be brighter at night



## BLUE Light

6500K contribute to make deep greens in gardens to be darker. For this reason direct looking into a 6500K LED light looks bright but standing behind the light the quality of the reflection of dark objects is horrible.



## Warranty

This light will maybe last 2 years

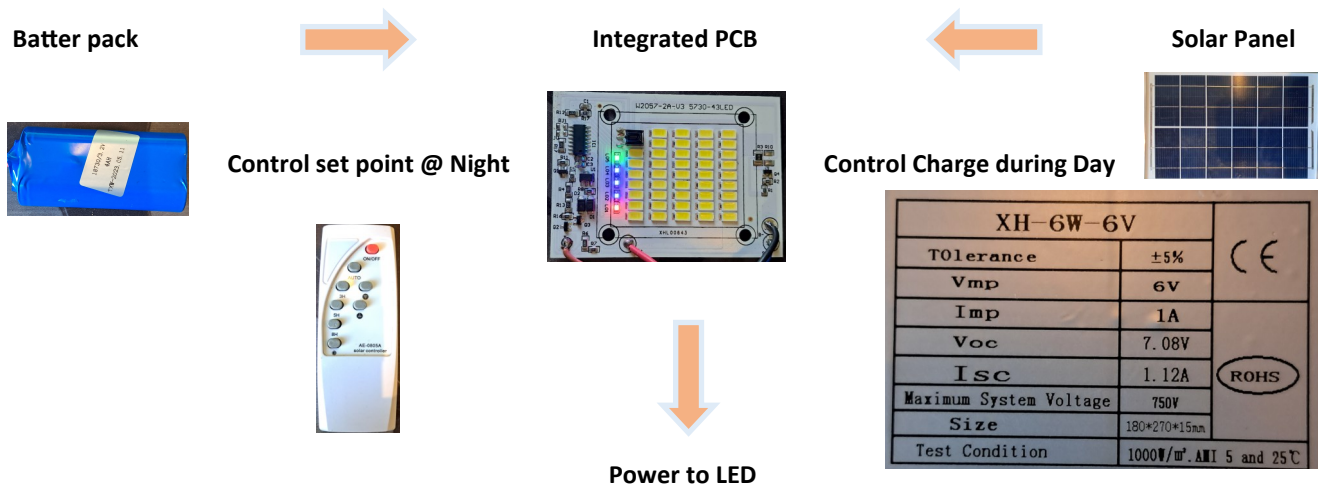


A detailed product image of a solar LED floodlight. It features a solar panel on top, a black housing, and a light lens. The product is shown against a dark background with a grid pattern. To the left of the product are five green circular icons: "Integrated LED", "IP66", "120°", "25000H", and "6500K". At the bottom right, the text "SOLAR LED FLOODLIGHT 20W" is displayed.



## Electrical Design and Evaluation of product performance

The AxxxA 20W(Other solution) will be evaluated from the Battery Pack that is connected to the Integrated PCB the solar panel will provide charge current and the LED's will consume power during the night. The Battery discharge and charge current will be evaluated.



## Battery PACK—Evaluation

There are two (2) Single cell 18730 Lithium batteries connected in parallel. This two parallel connected batteries increase the capacity to 4Ah. The nominal voltage of the battery pack is 3.2V therefore one can accept a total watt hour of 12.8Wh from the batter pack. The weight of the battery pack is ??

## Key Specifications/ Special Features:

Basic specifications:

Size: 18\*73mm x 2

Capacity: 2,000mAh x 2

Nominal Voltage: 3.2V

Charge Voltage (V): 3.65V

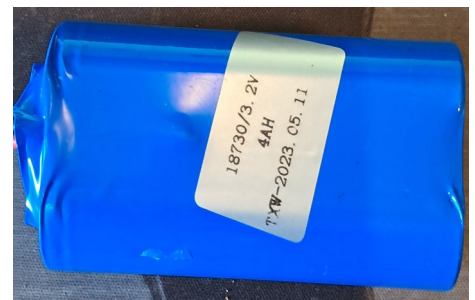
Max. Charge Current: 1C

Standard Discharge: 0.5C

Max. Discharge: 3C

Cycle Life: 1000≥80%

Operating Temperature: 0-45° Charge , -20-50° Discharge



## Battery life expectation

The AxxxA 20W(Other solution) have a cycle life of 1000 cycle if discharge to 80% State of charge.

This is 2 years and 7 months.

## The Other Cheaper Solution does not have MPPT (Maximum Power Point Tracking)



Testing MPPT algorithm, the power supply was set to 6V as per the MPPT value of the solar panel. The maximum current that was set to be available from the power source was set to 1A . After connecting the depleted battery pack the maximum transfer of power (W) was only 3.23W this is 50% lower than what the Solar Panel can provide.

The conclusion is that the Solar Panel is directly connected to the battery. There is no intelligent charging from the solar cell to the battery pack. This result in very low power conversion in overcast and winter months.

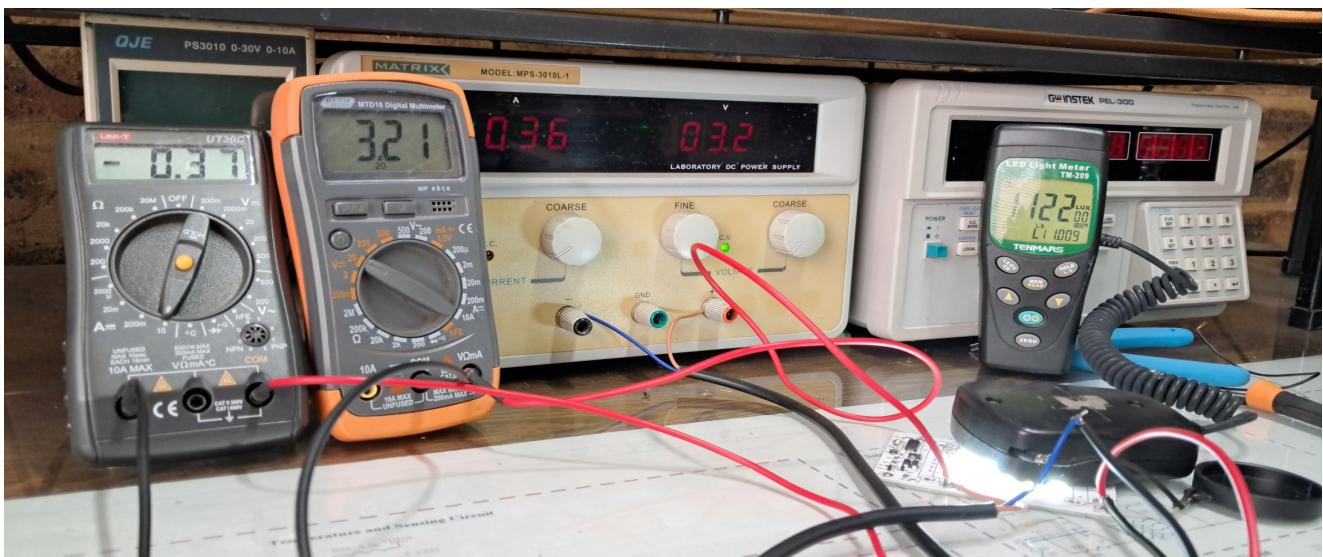
## Disconnect Voltage to prevent over charging

The AxxxA 20W(Other solution) do not provide over voltage or undervoltage cut out. This means that the unit keeps on charging even if unsafe voltage levels are reached from the solar panel. This will be a problem in longer days, during the summer. This can result in premature failure of the internal battery in shorter than 2 years. As the voltage climbs to 3.7V it is noticeable that the current is still high. Power transfer is now  $3.54V \times 0.99A = 3.5046W$  This clearly

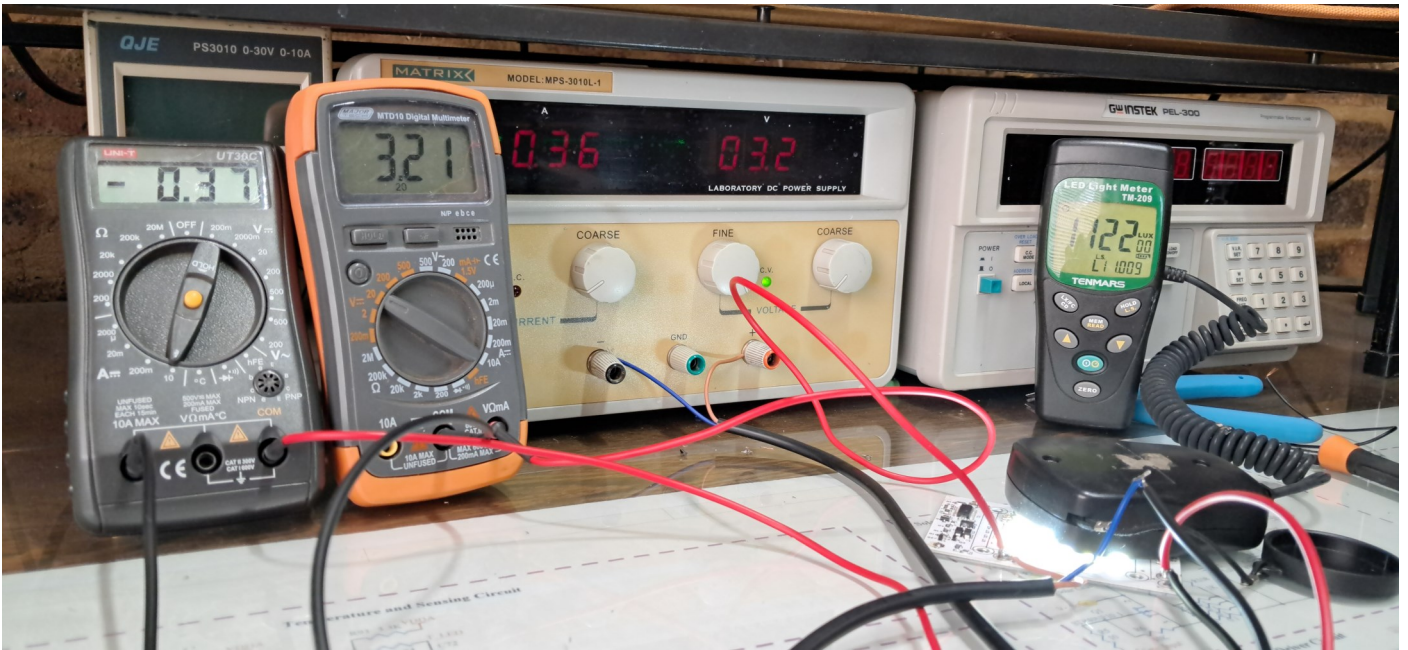


## Dropping of light intensity during discharge

The AxxxA 20W(Other solution) do not have a constant current driver on the LED output side. This means that a steep reduction in drive current is noted when the light operate

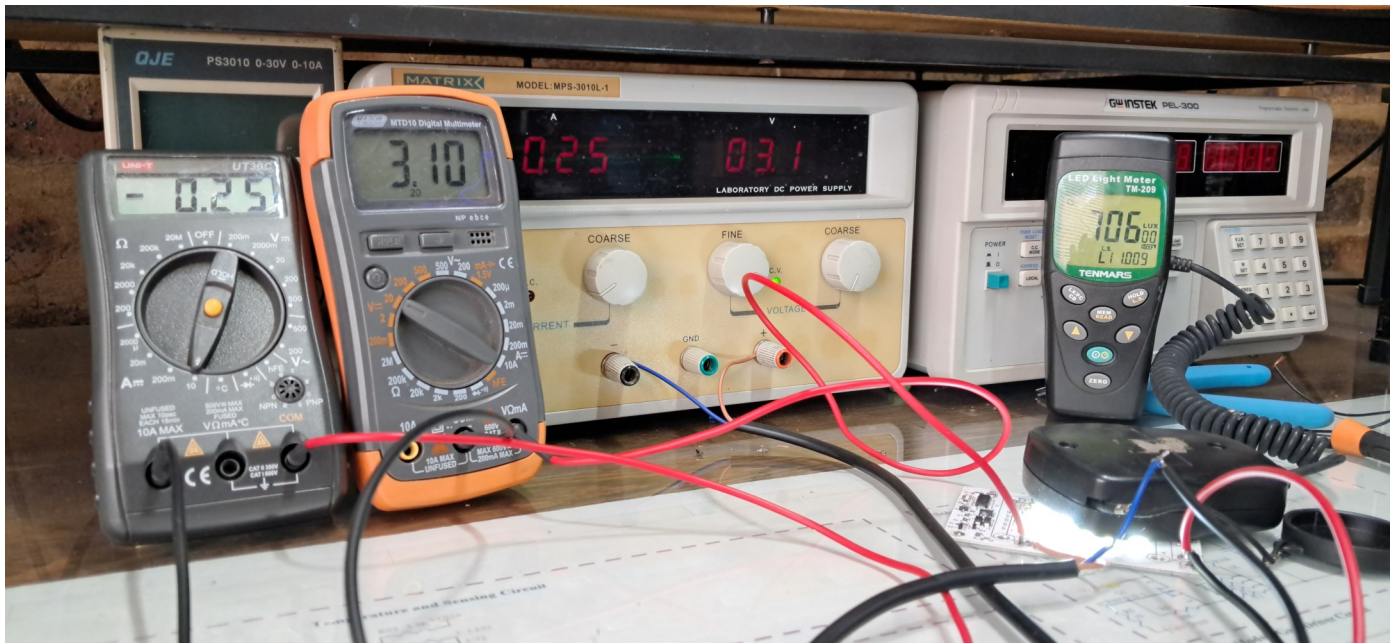






### Run test 3.21V on battery Pack

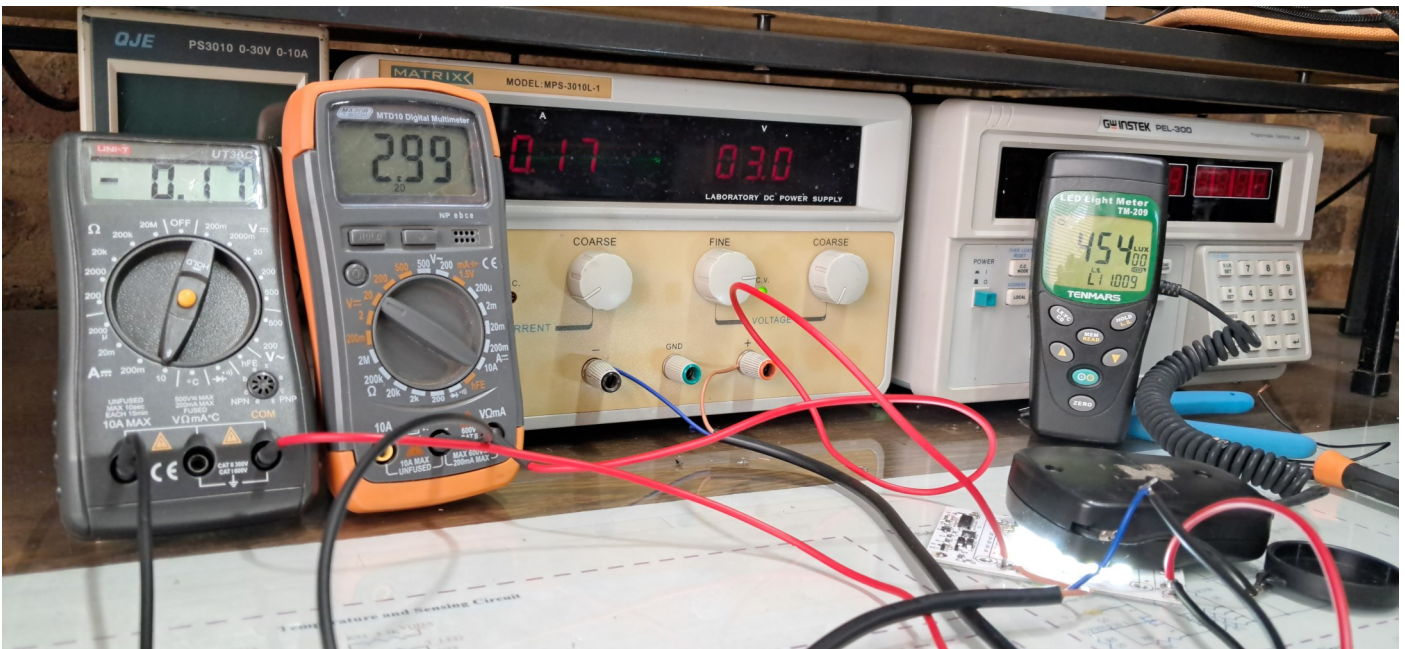
The AxxxA 20W(Other solution) there is no difference between the current drive of AUTO, 3 hours, 5Hours and 8 Hours the current out of the battery is 370mA @ 3.21V this is about 1.18Wh as the battery is 12.8Wh the unit will easy operate the whole evening. The intensity on the lux meter is 112200 this is



### Run test 3.10V on battery Pack

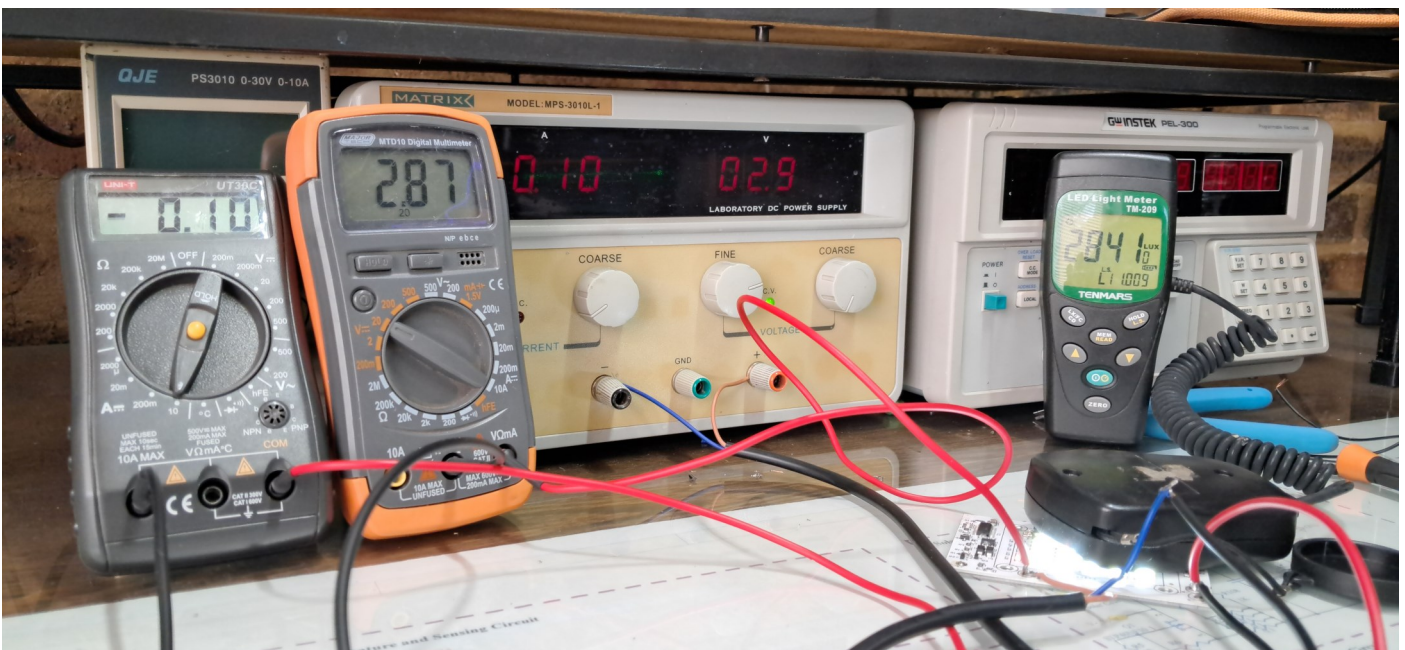
The AxxxA 20W(Other solution) there is no difference between the current drive of AUTO, 3 hours, 5Hours and 8 Hours the current out of the battery is 250mA @ 3.10V this is about 0.775Wh as the battery is 12.8Wh the unit will easy operate the whole evening. The intensity on the lux meter is 70600 this is only to indicate how fast the LED light loose intensity.





### Run test 2.99V on battery Pack

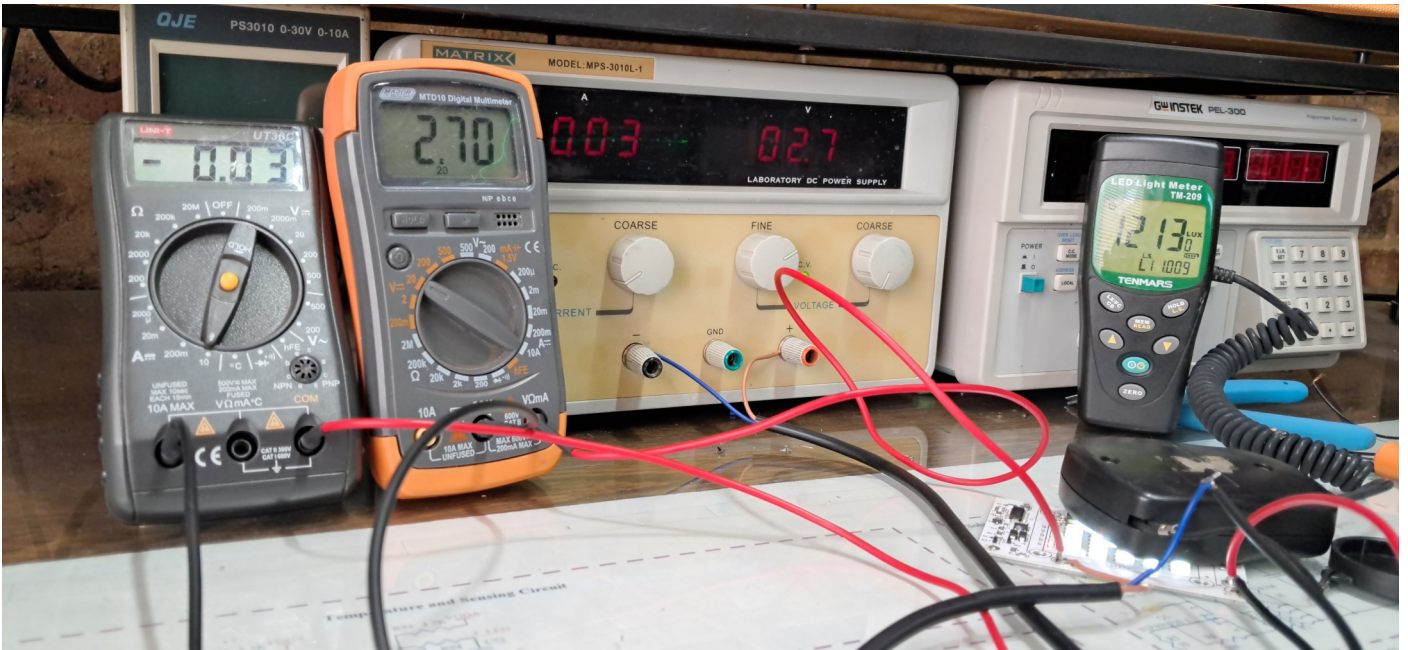
The AxxxA 20W(Other solution) there is no difference between the current drive of AUTO, 3 hours, 5Hours and 8 Hours the current out of the battery is 170mA @ 2.99V this is about 0.5083Wh as the battery is 12.8Wh the unit will easy operate the whole evening. The intensity on the lux meter is 45400 this is only to indicate how fast the LED light loose intensity.



### Run test 2.87V on battery Pack

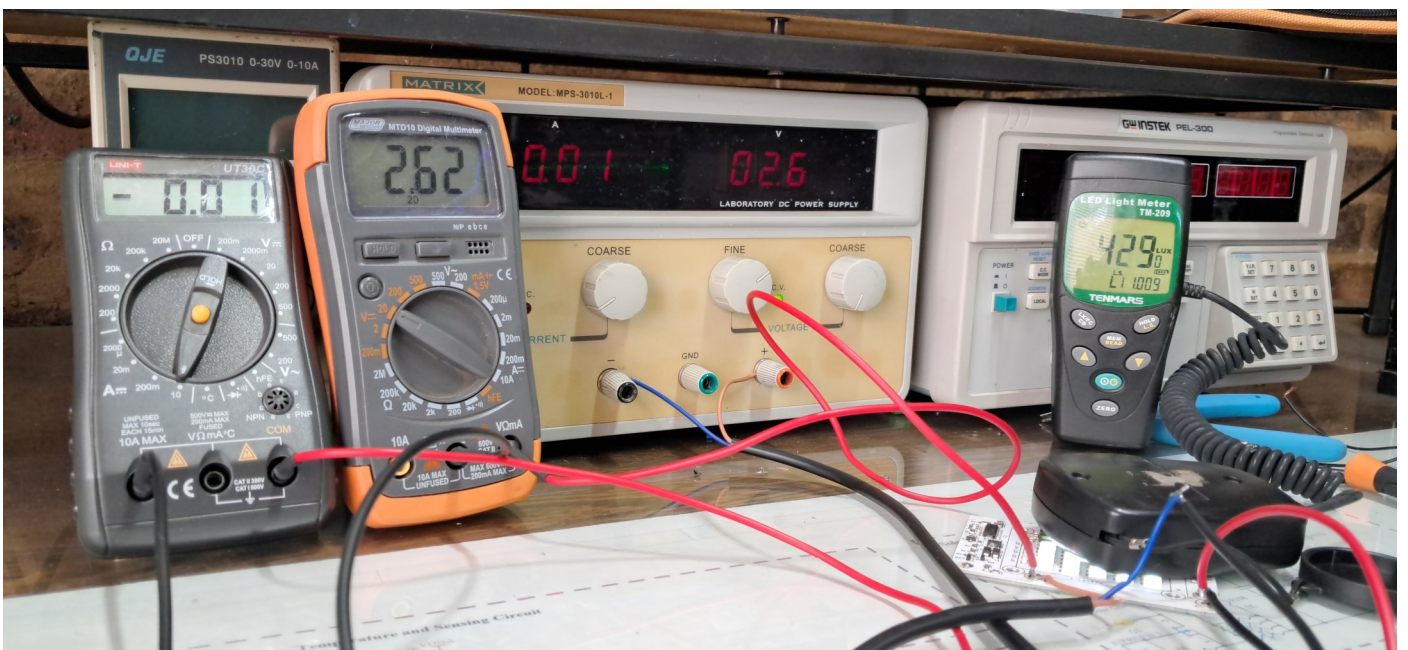
The AxxxA 20W(Other solution) there is no difference between the current drive of AUTO, 3 hours, 5Hours and 8 Hours the current out of the battery is 100mA @ 2.87V this is about 0.287Wh as the battery is 12.8Wh the unit will easy operate the whole evening. The intensity on the lux meter is 28410 this is only to indicate how fast the LED light loose intensity.





### Run test 2.70V on battery Pack

The AxxxA 20W(Other solution) there is no difference between the current drive of AUTO, 3 hours, 5Hours and 8 Hours the current out of the battery is 30mA @ 2.70V this is about 0.081Wh as the battery



### Run test 2.62V on battery Pack

The AxxxA 20W(Other solution) there is no difference between the current drive of AUTO, 3 hours, 5Hours and 8 Hours the current out of the battery is 10mA @ 2.62V this is about 0.0262Wh as the battery is 12.8Wh the unit will easy operate the whole evening. The intensity on the lux meter is 4290 this is only to indicate how fast the LED light loose intensity.



## Conclusion Summery Cheap solar Lights VS Phasor Electronics CC / [www.solarlight.co.za](http://www.solarlight.co.za)

Packaging and external build quality create the impression that the AxxxA 20W Solar Powered light a high quality product is at an affordable price.

The U-clamp for the Solar Light and the Solar Panel is not the best design and end customer will need to spend additional cost to fit the unit in certain applications. Additional the self tapping into the solar panel frame that is use to mount the U bracket for the Solar Panel is not strong enough and will result in the solar panel sagging and dropping out in a complete horizontal plane.

For the internal electronics there is no MPPT function. There is also no constant current drive to the LED chip set. This means that the unit behave like a flashlight. Very bring early evening but dropping in performance rapidly as the battery volts start to drop.

The settings for Auto, 3Hours, 5Hours, 8Hours are exactly the same the only difference is that it is manage with a timer. The timer will deactivate the light if the time run out. The dusk to dawn setting is a very low current setting.

The LED light source is directly connected to the battery pack this result that the LED light will always be on at night but with such low power that the light output will be useless.

The unit is an repacked solar powered Flash light and is lacking deeper electronic circuitry to make it a high quality solar powered LED light.

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## AxxxA 20W (Other Solutions)



**10W-3.2V**

10W-3.2V lithium Powered LED Flood Light

- 10Wp Poly Panel
- 4W LED output Power
- Brackets to mount on wall
- Flood Light
- 3.2V Lithium Ion 40Wh
- >5000 Battery Cycles

