



### Robusta series solar street lamps

Sunnytek Solar develops and produce street lamp solutions in Sweden. We offers a **modular concept** that is flexible and easy to optimize. The concept is like Lego pieces and can be assembled to get best desired functions. Key parts are of highest quality to give a long life with close to zero maintenance.

Solar lamps main reliability component is the battery system and led emitters and we have other solutions than others use here to get long life and ups to 10 years warranty of the lamp unit.



#### Lamp housings.

We have 2 models. One at left side is more solid and heavy and gives better heat dissipation and lower temperature of lamp. The other at right side is lighter and lamp get slightly hotter. The lighter unit is made



in Asia and the other in Sweden. Booth has aluminum casings and are powder painted with all external screws in stainless steel for longest life time. Other components and quality is the same. Corrosion is not an issue för at least 30 years even in salty conditions.

We have a special design to get better heat dissipation and by this we get colder LED emitter and driver and get more lifetime of the lamps.

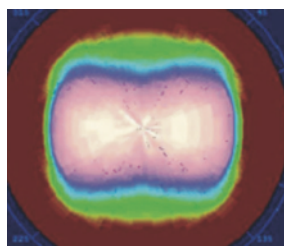
#### LED emitter from USA.

We only use led emitters from Bridgelux original USA due to reliability and performance. We use a special way to manipulate current to get more Lumen / W light flus and by this we have very high efficiency up to 230 Lumen / W. Life time measured to L70 test Standard is then far over 120 000 hours. We have never replaced any broken LED emitters.



#### Glass optics

We never use plastic optics that are very common due to life time. Glass work för many years but plastic lenses have a far shorter life time before getting yellow and degenerated. We use a lens with special asymmetric un-linear shape to get square light patterns on the road surface. We have several options in angles.



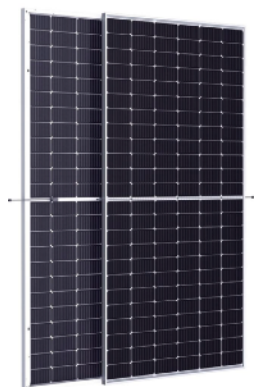


### Led driver

The led drivers is a key component as they normally have a shorter life cycle that the led itself. The drivers do normally have smart functions as constant current and power control, timer to change output at specific time windows and transient protection.

### Solar panel.

This is the heart of the system to give energy to the lamp system and its options. Demands differs a lot depending where lamp is installed and by good reasons we have 2 main designs for solar panels.



One model is **mono crystalline panels** that is the monster common panel and in many cases this is the best alternative. Mono panels suffers in high power losses for partial shadowing of solar rays by trees and buildings. Here they lose power dramatically. They are also less good in bad weather and haze and twilight. The weather characteristics are important to select the best solar panel.

The alternative model is thin film panels where we often use CIGS panels. They are larger than mono crystalline panels in area but in bad illumination conditions they may give up to 2 X more output. They are also far better when very hot.

Solar panels are not integrated as we must be able to direct panels to sun in best ways. Fixed panels with no adjusting gives large problems to collect enough energy.



### Energy storage / battery unit.

This is the most sensitive component and also the most expensive component. Solar lamps must have very high quality of the battery to get low maintenance costs and best life cycle costs. We use 2 models of battery for solar lamps that are well proven and reliable.

Li-Po battery is never used by us due to short life time of 2-3 years in most cases and they are also sensitive to fire and other problems.

The standard battery is Li-Fe-Po4 that is far better and more reliable to stress and many cycles. We use a supplier that normally have 10-15 years life cycle and often more than so. They handle 5000-7000 cycles in a lamp application. We offer 7 years warranty and this can be extended to 10 years.

For the most demanding applications we use LTO battery based on Titanium oxide. They handle 10000-20000 cycles of operation and can live for over 20-25 years. They are then more costly but Life cycle cost is clearly better.



### Poles.

Normally we offer a standard mount for 60 mm straight galvanized steel poles. There are other designs as wall mounts.

### Options.

- \* Timer / clock that can change light flux during specific hours. Mostly we tune down the lamp at mid night to save energy and increase life time on battery operation.
- \* Light switch that turn lamp on and off depending on ambient light
- \* Weather station with web interface. Standard model.
- \* Air quality monitor / particle detector with web interface. We have several models with different specifications.
- \* Web interface with GSM module and inputs for sensors and options



Particle Sensor  
**KA-02** (Light-scattering method)

Light source	Laser diode (wavelength 780 nm, rated output 20 mW)
Flow rate	2.50 L/min
Core range (F channel)	0.3 µm, 0.5 µm
Nominal detection sensitivity	140 000 000 particles/m <sup>3</sup> (calibration base 10 %)
Sampling tube diameter	Internal diameter: 1.5 inch, (approx. 3.2 mm)
Power	9 to 20 V DC (supplied by external unit, optional)
Dimensions and weight	52 (H) x 107 (W) x 53 (D) mm (incl. protruding parts). Approx. 350 g

✓ This product is environment friendly. It does not include toxic chemicals in our policy.



**Prices in a volume of 1000 pcs**

**Price / ea**

Robusta 4000 Lamp unit with 4000 Lumen output	Euro 100
Robusta 5100 Lamp unit with 5100 Lumen output	Euro 110
Robusta 7000 Lamp unit with 7000 Lumen output	Euro 120
Robusta Light switch	Euro 10
Robusta Timer	Euro 10
Robusta web interface and micro controller with inputs for options. Several models from	Euro 100-200
Weather station with Web interface. Depending on specifications from	Euro 150-600
Air quality monitor with web interface. Depending on specifications from	Euro 500-2000
Robusta CCTV web camera standard model.	Euro 70
Robusta CCTV web camera with PTZ unit included	Euro 100
Robusta CCTV high end camera for 24/7 High dynamic operation	Between Euro 200 and 500
Robusta CCTV + PTZ high end camera for 24/7 High dynamic operation.	Between Euro 250 and 1000

Solar panel units with bracket for lamp and street lamp pole in aluminum and stainless steel. They fit on all lamps and can be combined in any way desired. Connection cables included. Panel can be rotated 360 degree horizontally and up/down from 0-45 degree.

**Price /Ea**

SP 4000/110 CIGS Solar panel with mount and	110 W CIGS panel	Euro 90
SP 4000/150 MONO Solar panel with mount and	150W Mono crystalline	Euro 85
SP 5100/110 CIGS Solar panel with mount and	110W CIGS panel	Euro 90
SP 5100/150 MONO Solar panel with mount and	150W Mono crystalline	Euro 90
SP 7000/235 CIGS Solar panel with mount and	235W CIGS panel	Euro 170
SP 7000/315 CIGS Solar panel with mount and	315W Mono crystalline	Euro 130

BP LiFePo 40AH with charger, box and adapter	Price Euro 300
BP LiFePo 60AH with charger, box and adapter	Price Euro 350
BP LiFePo 100AH with charger, box and adapter	Price Euro 400

LiFePo has 7-15 years life time and 5000-7000 charge cycles measured at 70% capacity

BP LTO 33 AH with charger, box and adapter.	Price Euro 900
BP LTO 60 AH with charger, box and adapter.	Price Euro 1200
BP LTO 100 AH with charger, box and adapter.	Price Euro 1500

LTO has 15-30 years life time and 10000-20000 charge cycles measured at 70% capacity

