

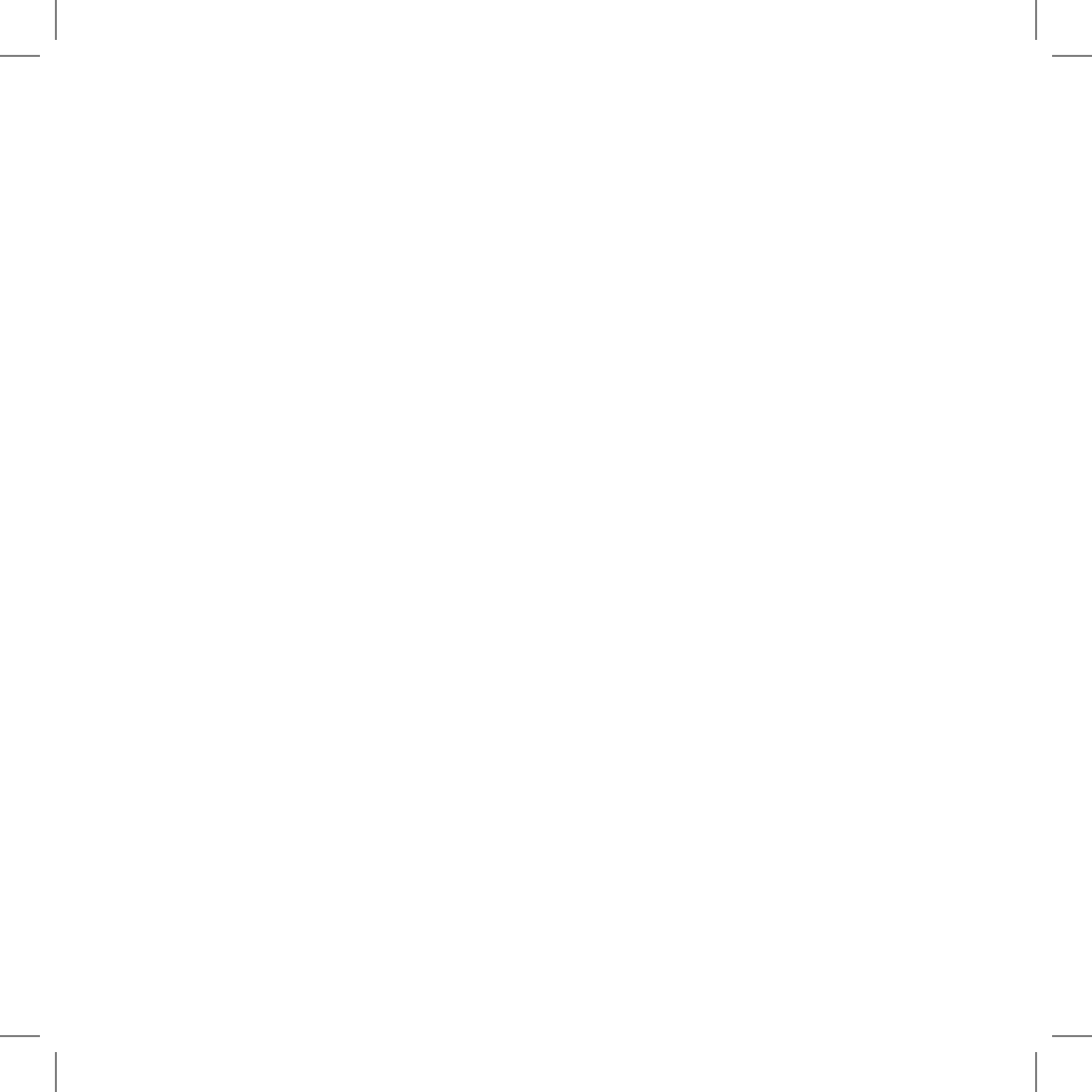


English



# T-Lite Lightkit User Manual

V 1

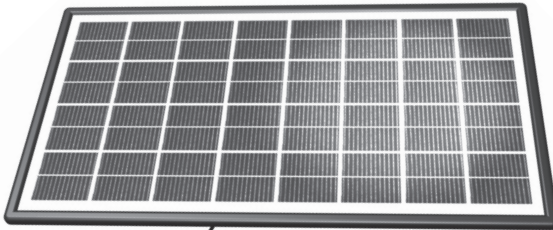


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# Overview

The Sundaya Lightkit system consists of very simple modular parts that you can connect together to form an expandable, energy-efficient lighting installation.



LEC  
(Light to Electricity Converter)

Bayonet Plug

T-Lite



Hub5



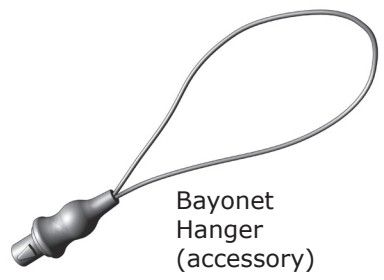
Cable with  
DC Plug and  
Bayonet Plug



Epack  
(inside T-Lite)



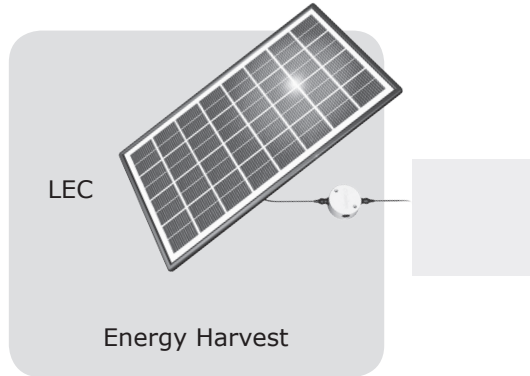
Bayonet  
Hanger  
(accessory)



## How does it work?

The concept of the basic Sundaya Lightkit is simple.

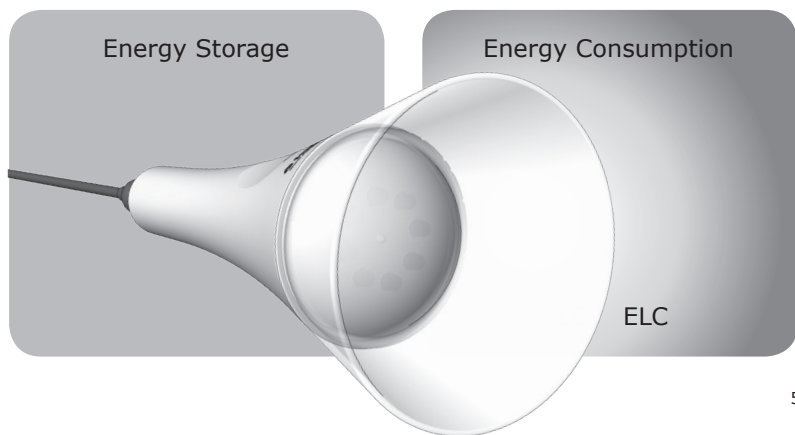
During the daytime, energy is harvested from the sunlight using the LEC (Light to Electricity Converter), and converted into electricity. This electrical energy is then passed through the cables and Hub5 in your installation, to the T-Lite.



When not in use, the T-Lite will store this electric energy in its Epack, and then convert it back to light whenever it is switched on. It is considered an ELC (Electricity to Light Converter).

You can have as many LECs and ELCs in your installation, as long as there is a good balance between energy harvested and energy consumed every day.

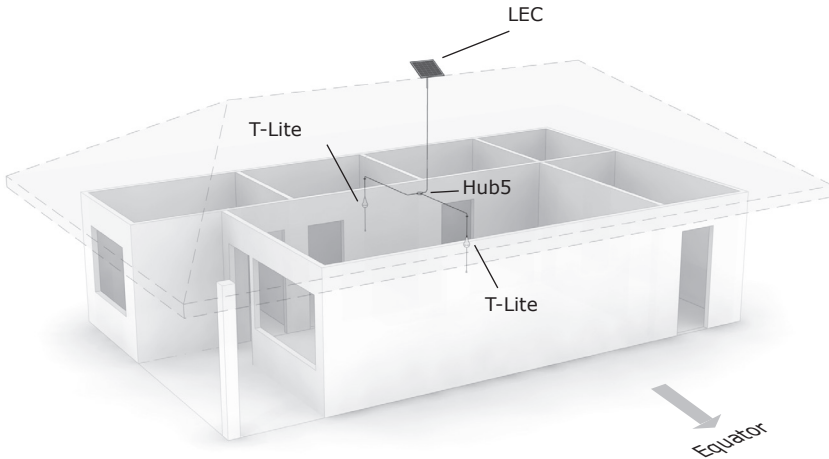
The harvesting capacity of the LEC in every Sundaya Lightkit has been chosen to be in good balance for the number of energy consumers included in the kit. If you want to add more energy consumers (lamps, TV, laptop computer, etc.) also more energy harvesters (LECs) have to be installed to maintain the energy balance between harvest and consumption.



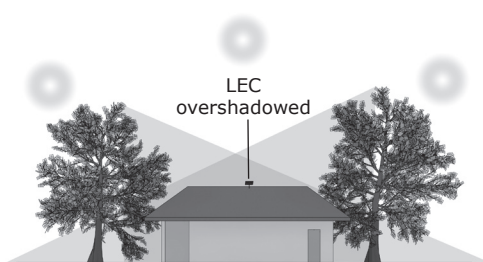
# Planning the installation

Before you begin installing the system, please consider where you would like to suspend the lighting, and the LEC's location on or near the roof.

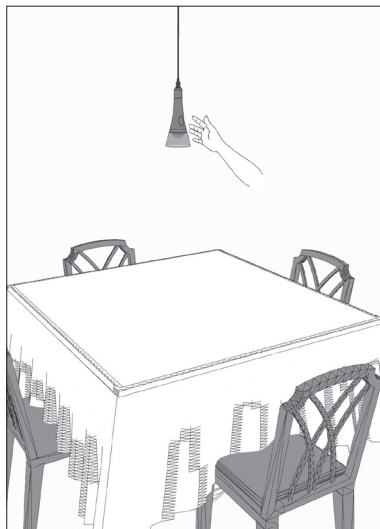
The LEC needs to face the equator, so choose the correct side of the roof.







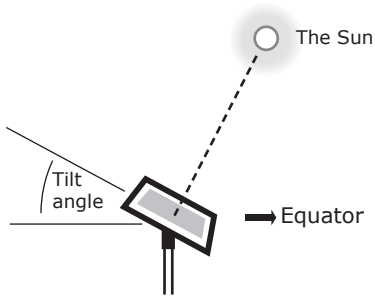
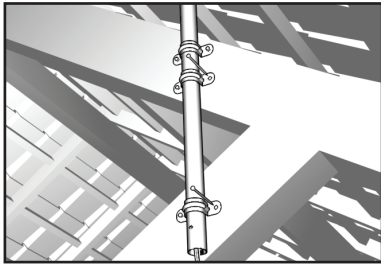
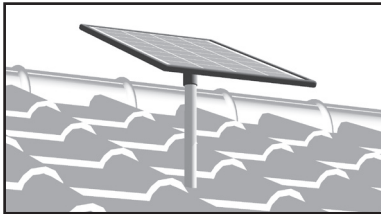
The LEC must not be overshadowed by trees or buildings throughout the day.



It is better to hang your T-Lite from the ceiling, directly above a desk, table or coffee table, such that the light distribution falls mainly on the table top. Fix the height of the suspended T-Lite so that you can still reach it to switch it on/off, or detach the lamp from its bayonet cable.

Once detached, you can use the T-Lite as a torch light to light your way at night.

Also once detached, the T-Lite can be placed standing on a flat tabletop.



## Installing the LEC

The LEC is designed to be mounted on a rigid pole. An aluminium or galvanized pipe of diameter 26 mm is ideal, but a thick PVC pipe is acceptable. The pole should be mounted on the rooftop, clamped or tied to the truss of the roof. If you cannot mount it there, you can also nail the pole on the outer wall of your house that is facing the equator, as long as the LEC is not overshadowed.

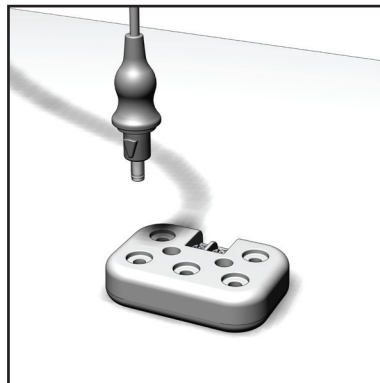
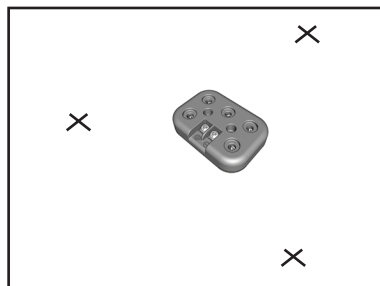
It is very important that the LEC be positioned facing the equator. If necessary, also adjust the LEC's tilt angle, so that at 12 o'clock the sun's rays should fall straight on the LEC's top surface for an optimal sunlight energy harvest.

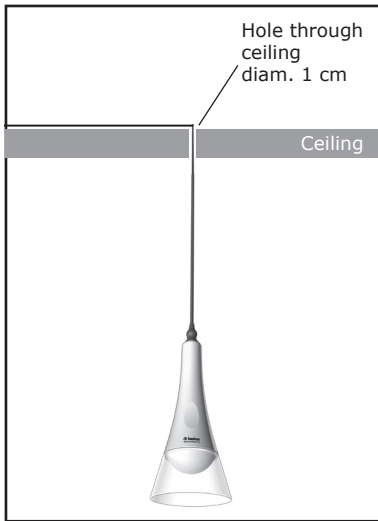
## Connecting the Hub5

Under the roof, place the Hub5 somewhere between the future locations of the T-Lites.

Insert the Bayonet Plug of the cable from the LEC, to one of the five ports on the Hub5.

OPTIONAL: for longer distances, you can also connect two Hub5's with an optional Sundaya DC cable, wired to the terminals underneath each Hub5.

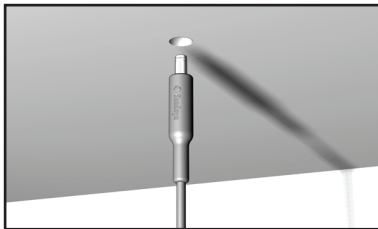




## Installing the T-Lite

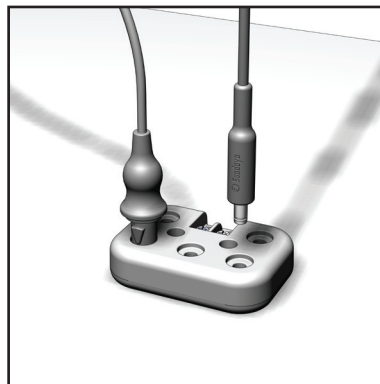
The T-Lite is designed to be suspended from the ceiling.

It is best to arrange the height such that the T-Lite can still be reached by hand, so that you can easily detach and reattach the lamp from and to its Bayonet cable.



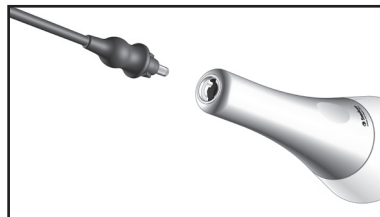
At the precise location on the ceiling where you have planned to suspend the T-Lite, drill a hole 1 cm in diameter, barely large enough to allow a DC Plug to pass through.

Pass the DC Plug and rest of the cable through the hole in the ceiling you just made. Then connect the DC Plug that has been passed through the ceiling, to any available ports on the Hub5.

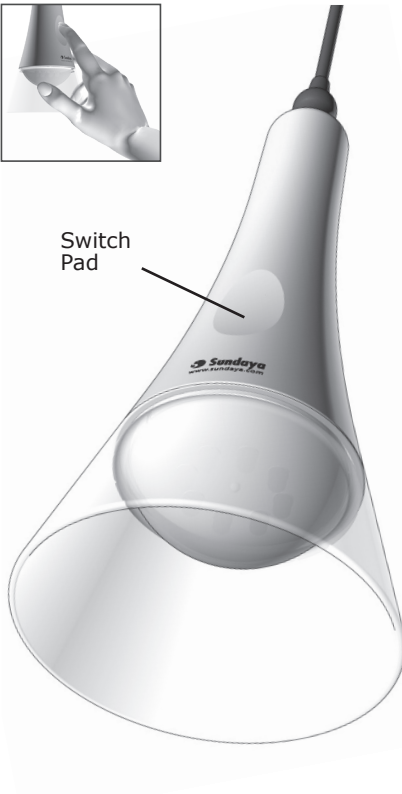
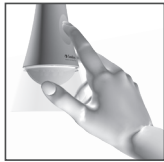


It is a good idea to loop the cable over something (e.g: a truss, or wooden beam) so that the cable will not slip back or become unplugged, due to the weight of the lamp.

Once the desired height is fixed, insert the Bayonet Plug of the cable provided, into the socket on top of the T-Lite. Twist the Bayonet Plug clockwise to lock it in place.



If your T-Lite Lightkit has more than 1 lamp, repeat the above steps for the each remaining lamp in the kit.



## Operating the T-Lite

Observe the side of the T-Lite. Directly above the Sundaya logo, there is an oval recessed area which is the Switch Pad.

The Switch is very sensitive (fast acting) and please train yourself to operate the lamp. It is very easy once you know how to do it, as follows:

### **ON / OFF the T-Lite:**

A quick tab on the Switch Pad will toggle the switch;

If the lamp was OFF it will directly go ON in full brightness;

If it was ON it will directly go OFF

### **Dim / Brighten the T-Lite:**

A touch-and-hold of your thumb or finger on the Switch Pad will do the following.

If T-Lite is OFF:

it will go ON in full brightness and slowly dim down

If T-Lite is ON (and was dimmed during last operation):

it will slowly brighten up.

If T-Lite is ON (and was brightened up during last operation):

it will slowly dim down again.

Release your hold on the switch when the desired dim position is achieved.

### **Automatic Off**

If the T-Lite has been used and the stored energy has been fully consumed the lamp will switch off automatically to prevent the battery from damage.

If you try to switch it on again after automatic switch off due to depleted energy; it could maybe light up a few seconds again but will than immediately switch off again by itself.

The more often you try to switch on the lamp will turn on every time for a shorter duration than before until it does not come on anymore; which is a clear indication that the battery's usable energy is completely depleted.

*Note: Even though it does not switch on anymore there is still energy left in the Epack to let the electronic circuit carry out its basic protection tasks but no more energy is left to light up the lamp*

*Only after a minimum of 20% of the Epack is recharged; the T-lite can be used again but it is better to let it get fully recharged before use again.*

### **Use of T-Lite as a Torch Light:**

Your T-Lite can be detached from its cable, to be used as torch light. Do not forget to return the T-Lite plugged back to its cable whenever the lamp needs recharging.

You can attach a Bayonet Hanger accessory to your T-Lite, and wear

its strap around your wrist to prevent the lamp from accidentally falling off your hand. The Bayonet Hanger also seals the back socket, to prevent water from entering the unit during use in the rain.

*Note: The T-Lite is drop water proof when the Bayonet Hanger is put in place to seal off the connector; but should never be submerged in water. In case water enters the electrical contacts and electronics, it can cause short circuit and galvanic corrosion, and this damage under no circumstance is claimable under warrantee.*

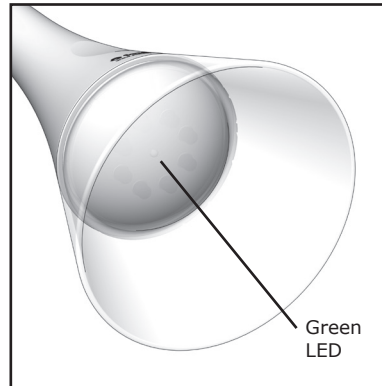
### **Efficient use of T-Lite:**

Your T-lite will achieve maximum life performance when you use it as efficiently as possible. In case you do not need the light switch off the lamp and in case you do not need the maximum brightness; reduce the light output by dimming it. Operating the lamp at lower brightness extends the lamp's useful life.

## Charging the T-Lite

When the battery's energy is below 100%, it will be able to accept charge. After plugging the lamp to an LEC or an AC-DC converter, the Green LED will glow dimly indicating that it is accepting the charge.

When the battery reaches full charge the electronic circuit will





automatically cut off the charge and the Green LED will go off.

*Note: It is not necessary that the green LED goes off; sometimes it can stay on while the lamp is charging the last 1% with a very small current to full. The T-Lite has built in protection to prevent over charge so it does not need to be disconnected from Charge source when it is full (the only reason to disconnect it from the charge source is when you want to use it as a torch light).*

## Troubleshooting

Problems:

- 1) T-Lite does not switch on
- 2) T-Lite does not Charge from LEC
- 3) T-Lite does not charge from AC-DC Converter

### 1. T-Lite does not switch on:

**Possible Cause 1:** No more energy left to switch on the lamp

**Solution:** Recharge the lamp until a minimum of 30% full (green Led should light up which indicates that charge is being accepted)

**Possible Cause 2:** Epack or Epack connectors are damaged/corroded

**Solution:** Take out the Epack and check for damaged or corroded terminal pins; and if indeed damaged or corroded; take the unit to a Service center to get it solved or get an Epack replacement.

## **2. T-Lite does not charge from LEC:**

**Possible Cause 1:** There is a connection problem in the DC Distribution system.

**Solution:** Check all the connections and cables for possible damage (if more than one lamp is used in the system try to interchange the lamps that do charge to the connectors that can charge to identify the problem-point).

**Possible Cause 2:** The sun's light intensity is still too low to provide enough energy to start charging of all the lamps connected to the LEC.

**Solution:** Check the sunlight condition and if indeed low light intensity; check again later during mid-day when light intensity is higher.

**Possible Cause 3:** The LEC is covered by dust or shaded by overhanging tree branches or other objects which causes the energy output of LEC to be too low to provide energy to all lamps.

**Solution:** Check the LEC for dirt and clean if necessary and check for possible shading causes and remove those causes to improve energy output of LEC.

*Note: It is normal that in morning or late afternoon when sun's intensity is low that not all lamps are charging; some lamps might stop charging to prioritize the other lamps that are at lower charge condition and need the charge the most.*

**Possible Cause 4:** The LEC's capacity under the local weather condition is insufficient to charge all the lamps at the same time.

**Solution:** Increase the Energy Harvest capacity by adding additional LEC's; or do not completely deplete all energy from the lamps in the evening so that all lamps can get fully charged the next day.

*Note: The consumption of energy during the night must be tried to be in balance with the energy harvest*

*during the day and if possible available balance in Epack carried forward to the next day....so that in case of days of less sunshine we create some energy stock to keep enjoying the lighting installation.*

### **3. T-Lite does not charge from AC-DC Converter:**

**Possible Cause 1:** There is a connection problem in the DC Distribution system.

**Solution:** Check all the connections and cables for possible damage (if more than one lamp is used in the system try to interchange the lamps that do charge to the connectors that can charge to identify the problem-point).

**Possible Cause 2:** There is a connection problem between the AC socket and the AC-DC converter.

**Solution:** Check the AC output and make sure the connection is proper.

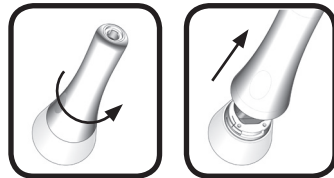
**Possible Cause 3:** The AC-DC converter is damaged.

**Solution:** Replace the AC-DC converter with another working AC-DC Converter to verify if it is broken, and replace with a new one in case it is broken.

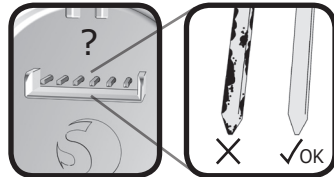
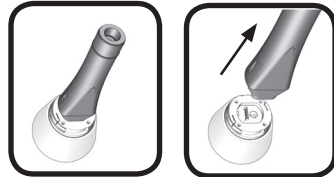
# Replacing the Epack

In case it has been established that the Epack inside the T-Lite is faulty, it can be replaced easily through the following method:

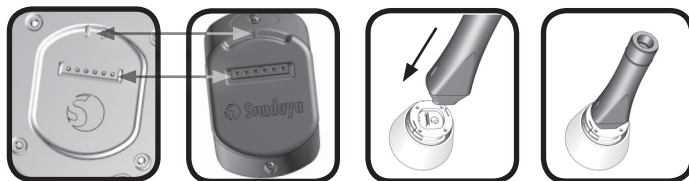
1) Twist the handle anti-clockwise and take off the handle



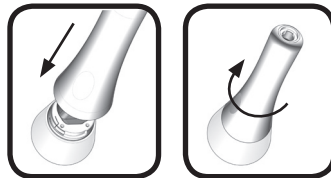
2) Pull out the Epack, and make sure that the contact pins are clean and free of corrosion.



3) Insert the new Epack.



4) Put the handle back in place and twist it clock-wise back in place to secure the handle and Epack again.



5) Your lamp should work again.



*Warning: There are no serviceable parts inside the Epack and unauthorized opening of the unit could be dangerous and will void the warranty. Please do not throw the Epack in normal household waste disposal but return the Epack to a Service center for proper waste disposal and recycling of the useful materials in an environmentally friendly and responsible way.*

# Energy Accounting

All Sundaya products are rated in Joules for energy harvest, storage and consumption, and Lumens for light output of lamps.

## Joule

Joule is the unit to quantify energy (all forms of energy can be quantified in Joule). The higher the Joule number, the higher the energy amount.

## Lumen

Lumen is the unit to quantify the total amount of light emitted by a lamp. The higher the Lumen number, the more light it emits.

For more information about energy education, please visit [www.kajul.org](http://www.kajul.org).

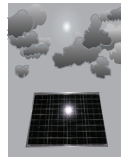
# Energy Harvest

The Sundaya solar panel range is named LEC (light to Electricity converter) followed by a number that indicates the amount of electrical energy (in kiloJoules) that it can harvest at 4.5 sun-hours per day (4.5 sun-hours is the average in tropical regions).

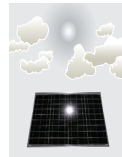
During bad weather or cloudy days the sun-hours can go as low as 3 sun-hours per day (sh/d), and in very bright days as high as 6 sh/d.

The table on the next page gives the range of daily energy harvested from the available LEC range.

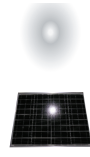
## LEC200



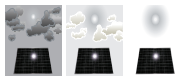
3  
sun-hours/  
day  
(sh/d)



4.5  
sun-hours/  
day  
(sh/d)



6  
sun-hours/  
day  
(sh/d)



Range	Model	Energy Output			Electrical Characteristics					Mechanical Details			
		@3 sh/d (kj/day)	@4.5 sh/d (kj/day)	@6 sh/d (kj/day)	Imp (A)	Vmp (V)	Pm (J/s)	Isc (A)	Voc (V)	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
Mini Panel Range	LEC50	33	<b>50</b>	67	0.19	16.5	<b>3</b>	0.20	19.5	168	278	9	0.9
	LEC100	67	<b>100</b>	133	0.37	16.5	<b>6</b>	0.40	19.5	278	278	9	1.2
	LEC150	100	<b>150</b>	200	0.56	16.5	<b>9</b>	0.61	19.5	388	278	9	1.5
	LEC200	133	<b>200</b>	267	0.75	16.5	<b>12</b>	0.81	19.5	498	278	9	1.9
Medium Panel Range	LEC300	200	<b>300</b>	400	1.12	16.5	<b>19</b>	1.21	19.5	330	735	37.5	3.4
	LEC450	300	<b>450</b>	600	1.68	16.5	<b>28</b>	1.82	19.5	450	735	37.5	4.4
	LEC600	400	<b>600</b>	800	2.24	16.5	<b>37</b>	2.42	19.5	570	735	37.5	5.4
	LEC750	500	<b>750</b>	1000	2.81	16.5	<b>46</b>	3.03	19.5	690	735	37.5	6.4
	LEC900	600	<b>900</b>	1200	3.37	16.5	<b>56</b>	3.64	19.5	810	735	37.5	7.4
	LEC1200	800	<b>1200</b>	1600	4.49	16.5	<b>74</b>	4.85	19.5	1010	735	37.5	9.1
	LEC1500	1000	<b>1500</b>	2000	5.61	16.5	<b>93</b>	6.06	19.5	1210	735	37.5	10.7
	LEC2000	1333	<b>2000</b>	2667	7.48	16.5	<b>123</b>	8.08	19.5	1430	735	37.5	12.6



# Energy Consumption

T-Lite Light Output, Energy Consumption and Operating Hours.

Switch Position	Light Output (%)	Light Amount (Lumen)	Energy Consumption (kJ = kilo-Joule)	Maximum Operating Hours without refill (based on 60kJ internal storage)
brightest	100	180	8 kJ per hour	7.5 hours
dimmed	50	90	4 kJ per hour	15 hours
lowest	10	15	0.8 kJ per hour	75 hours
Off (100%)	-	-	5 J per day	15 years
Off (LVD)*	-	-	5 J per day	12 months

\* After the T-Lite switches off by itself because of a Low Voltage Disconnect, it should be recharged immediately. If left uncharged for more than 2 months, the battery pack may suffer damage, and no longer be rechargeable.

## What next?

This product range is just the beginning of an exciting series of innovative products.

You can expand this basic installation with:

- other Lightkits,
- an STV with more lights,
- a laptop computer,
- more LECs,
- an AC to DC Converter to use along with grid electricity,
- more T-Lite,
- other accessories,
- or anything that will become available in this product range.

The possibilities are unlimited.

Thank you and enjoy your **Energy Independence!**



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