

LEC600

Product Specifications
PS-LEC600-01/01-100616

General

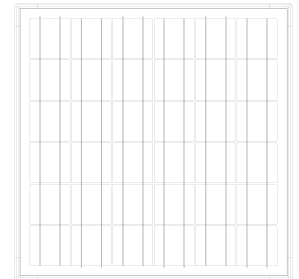
Product Name	Photovoltaic Module (PV Module)
Product Type	LEC600
Product Description	High Efficiency Multi Crystalline Photovoltaic Module for solar home system applications



Electrical Details

Electricity Generation Capacity	587 kJoule/day @ 4.5 Sun Hours
Maximum Energy Rating (Pmax)	36 Wp
Tolerance	+/- 5%
Cell Efficiency	+/- 17%
FF	+/- 75%
Total Cell	36 Cell
Maximum Power Voltage (Vmp)	17.60 V
Maximum Power Current (Imp)	2.06 A
Open Circuit Voltage (Voc)	22.19 V
Short-Circuit Current (Isc)	2.17 A
Maximum System Voltage (Vmax)	600 V

FRONT VIEW



Thermal Parameters

Nominal Operating Cell Temperature	40°C to 90°C
Isc Current Temperature Coefficient	(1.33 x 0.001) A/°C
Voc Voltage Temperature Coefficient	(-8.21 x 0.01) V/°C

Note: The electrical specifications are under test conditions of Irradiance of 1kW/m², spectrum of 1.5 air mass and cell temperature of 25°C

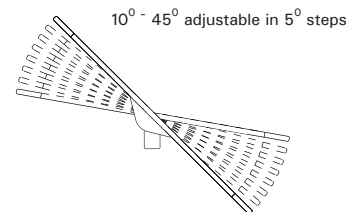
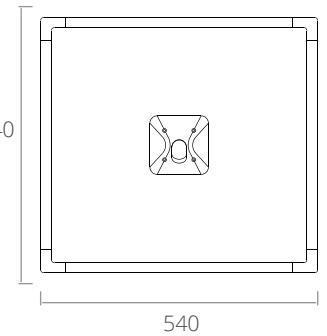
Mechanical Details

Frame Materials	Anodized Aluminium
Product Dimensions (LxWxH)	540 x 540 x 62 mm
Nett Weight	3.40 kg

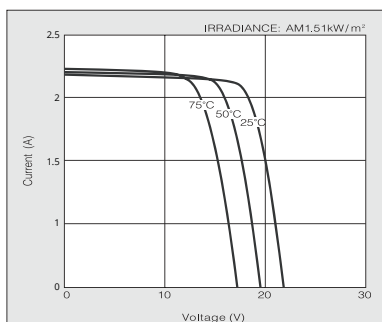
SIDE VIEW



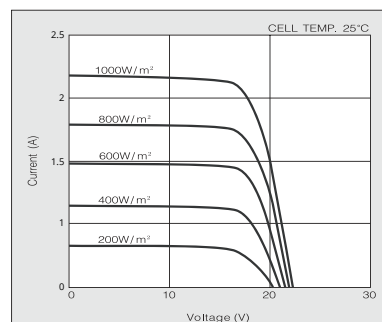
BACK VIEW



Current-Voltage characteristics of Photovoltaic Module LEC600 at various cell temperatures



Current-Voltage characteristics of Photovoltaic Module LEC600 at various irradiance levels



JouleBox 500

Product Specifications
PS-JOULEBOX500-01/02-180215

The **JouleBox** is an Energy Storage Solution based on Li-ion battery chemistry specifically designed for use with DC appliances. The **JouleBox** has a storage capacity of 500kj and can supply up to 600.000kj (600 MJ) over it's battery lifetime which depending on it's daily usage and rate of discharge will give a useful service life of 3 up to 10 years.

The **JouleBox** can be charged from LEC200 up to LEC1500 (or any type of 36 Cell 20Wp to 100Wp PV solar panel with Vmpp of 17.5V).

The **JouleBox** has 2 universal outputs to supply any DC appliances that can run from 12 to 16VDC source. Typical appliances that can be used with the **JouleBox** are Sundaya LCD TV of 18" up to 32" and Ceiling fans of 30 up to 70cm diameter.

The **JouleBox** also has 2 USB ports for charging USB devices like mobile phones and Tablets. Furthermore it is equipped with 2 docks with Bayonet fitting to recharge Sundaya JouleSticks that can be used in all Sundaya Portable products. The integrated electronics of the **JouleBox** take care of the health management of each cell's capacity to ensure a long life of the storage system. The electronics also protect against short circuit, overload, and overusage. A state of charge indicator provides information about the energy content in the **JouleBox**.



Energy

Energy Content	580 kj
Energy Available for usage	500 kj

Lifetime Energy Supply Capacity

@ 2 hour discharge rate	300.000 kj
@ 4 hour discharge rate	450.000 kj
@ 8 hour discharge rate	600.000 kj

Charging details

Max Charging Capacity (per hour)	400 kj/h
Max Charging Capacity (per second)	110 J/s (W)
Max Charge Current	8 A

Discharging details

Max Discharging Capacity (per hour)	250 kj/h
Max Discharging Capacity (per second)	70 J/s (W)
Max Discharging Current	5 A
Output Voltage Range	12-16 VDC

Input / Output Ports

Charging input port (5.5-2.0mm socket)	2 pcs
Load Output port (4.0-1.6mm socket)	2 pcs
USB output socket 5V, 2A	2 pcs
JouleStick Charging Dock 5V, 1A	2 pcs

Product Dimensions

Length	146 mm
Width	80 mm
Height	101 mm
Mass	1.250 gr

Protections

Protection on Inputs	Over Voltage Cut-off Over current Protection Reverse Polarity protection Reverse current protection Voltage surge protection
Protection on 12-16 V Outputs	Under Voltage Cut-off Over Load Protection Short Circuit Protection Reverse current protection
Protection on USB Outputs	Over Load Protection Short Circuit Protection

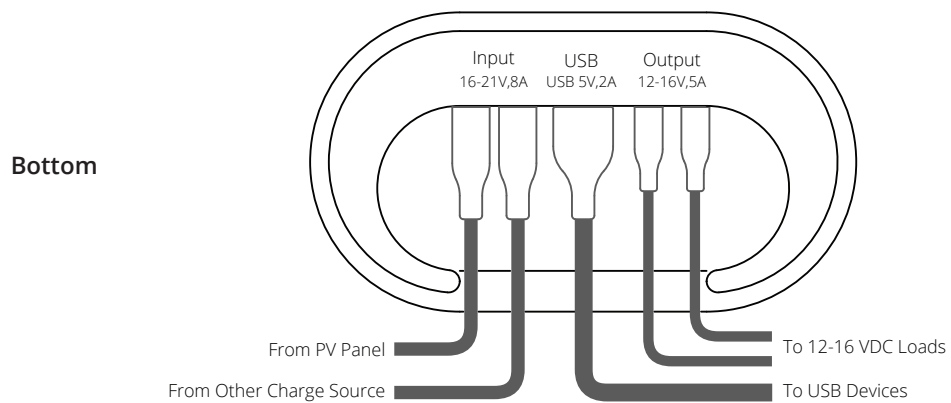
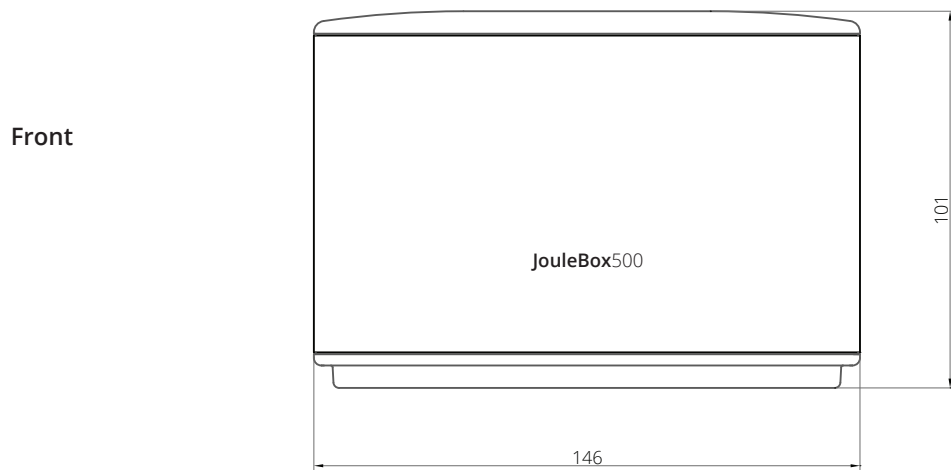
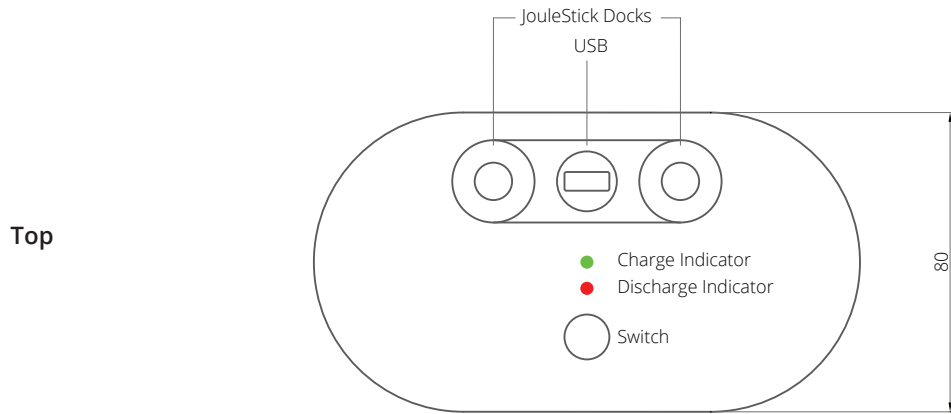
Others

Electronic Master On/Off Switch	Yes
State of Charge Indicator by green LED (activated upon switch press)	5 Blinks = 100% 4 Blinks = 80% 3 Blinks = 60% 2 Blinks = 40% 1 Blink = 20%
Low Voltage Cut-Off indicator	by Red LED

JouleBox 500

Product Specifications
PS-JOULEBOX500-02/02-180215

Mechanical Dimensions



JouleBox 1000

Product Specifications
PS-JOULEBOX1000-01/02-180215

The **JouleBox** is an Energy Storage Solution based on Li-ion battery chemistry specifically designed for use with DC appliances. The **JouleBox** has a storage capacity of 1000kj and can supply up to 1.200.000kj (1200 MJ) over it's battery lifetime which depending on it's daily usage and rate of discharge will give a useful service life of 3 up to 10 years.

The **JouleBox** can be charged from LEC200 up to LEC1500 (or any type of 36 Cell 20Wp to 100Wp PV solar panel with Vmpp of 17.5V).

The **JouleBox** has 2 universal outputs to supply any DC appliances that can run from 12 to 16VDC source. Typical appliances that can be used with the **JouleBox** are Sundaya LCD TV of 18" up to 32" and Ceiling fans of 30 up to 70cm diameter.

The **JouleBox** also has 2 USB ports for charging USB devices like mobile phones and Tablets. Furthermore it is equipped with 2 docks with Bayonet fitting to recharge Sundaya JouleSticks that can be used in all Sundaya Portable products. The integrated electronics of the **JouleBox** take care of the health management of each cell's capacity to ensure a long life of the storage system. The electronics also protect against short circuit, overload, and overusage. A state of charge indicator provides information about the energy content in the **JouleBox**.



Energy

Energy Content	1.160 kj
Energy Available for usage	1.000 kj

Lifetime Energy Supply Capacity

@ 2 hour discharge rate	600.000 kj
@ 4 hour discharge rate	900.000 kj
@ 8 hour discharge rate	1.200.000 kj

Charging details

Max Charging Capacity (per hour)	400 kj/h
Max Charging Capacity (per second)	110 J/s (W)
Max Charge Current	8 A

Discharging details

Max Discharging Capacity (per hour)	500 kj/h
Max Discharging Capacity (per second)	140 J/s (W)
Max Discharging Current	10 A
Output Voltage Range	12-16 VDC

Input / Output Ports

Charging input port (5.5-2.0mm socket)	2 pcs
Load Output port (4.0-1.6mm socket)	2 pcs
USB output socket 5V, 2A	2 pcs
JouleStick Charging Dock 5V, 1A	2 pcs

Product Dimensions

Length	146 mm
Width	80 mm
Height	166 mm
Mass	2.100 gr

Protections

Protection on Inputs	Over Voltage Cut-off Over current Protection Reverse Polarity protection Reverse current protection Voltage surge protection
Protection on 12-16 V Outputs	Under Voltage Cut-off Over Load Protection Short Circuit Protection Reverse current protection
Protection on USB Outputs	Over Load Protection Short Circuit Protection

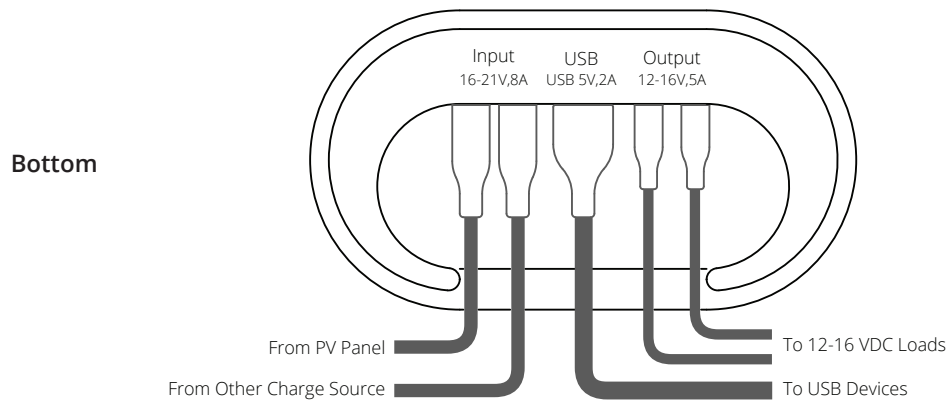
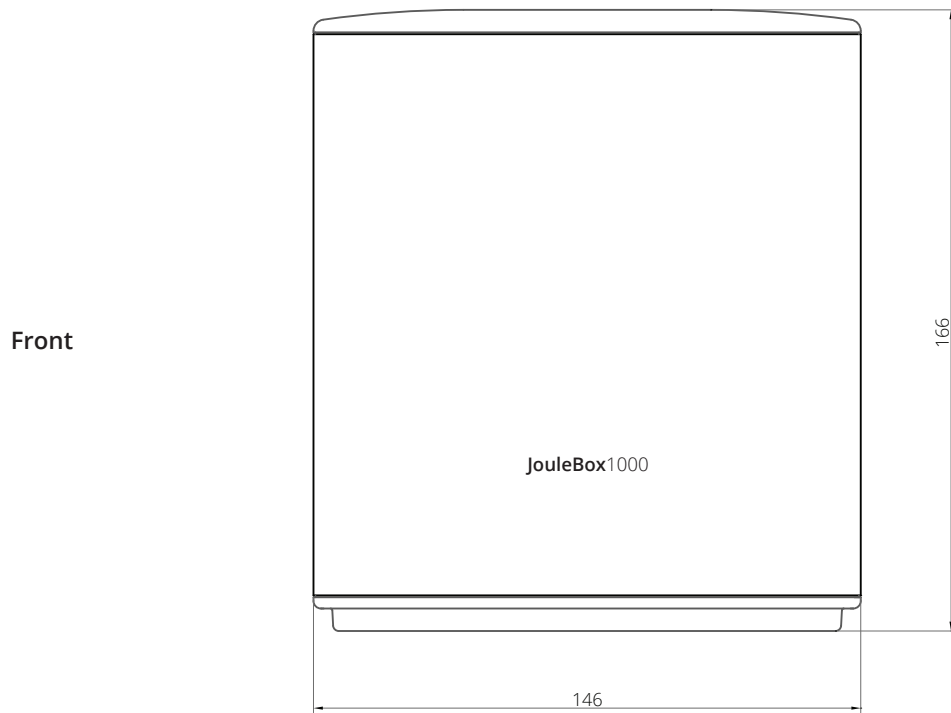
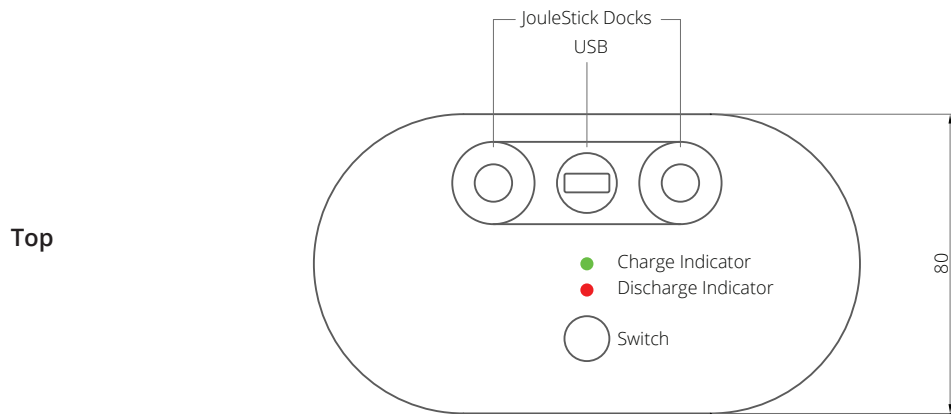
Others

Electronic Master On/Off Switch	Yes
State of Charge Indicator by green LED (activated upon switch press)	5 Blinks = 100% 4 Blinks = 80% 3 Blinks = 60% 2 Blinks = 40% 1 Blink = 20%
Low Voltage Cut-Off indicator	by Red LED

JouleBox 1000

Product Specifications
PS-JOULEBOX1000-02/02-180215

Mechanical Dimensions



A100 / Ulite100

Product Specifications
PS-A100-01/01-180716

The A100 is a DC Light bulb based on ultra efficient Light Emitting Diode Technology that can operate within a DC Voltage range of 12 up to 16 V. The Ulite is connected through a unique plug and play cabling system that allows for a very quick installation, Change of lamp and cable extension. The Ulite has a highly diffused lens to give a non glare and equally distributed light output that is safe for the eyes.



Ulite Performance

Minimum Light Output (between 12-18V operating range)	100 Lumen
Color Temperature	5000K (Cool White)
Average Electricity to Light Conversion efficiency (of Light Engine)	24%
Average Electricity to Light Conversion efficiency (Including Diffusor)	20%
Maximum Energy Consumption	3 kJ/h (0.8W)
Energy Consumption stated on product	3 kJ/h
Lumen Maintenance (down to 70% of original value)	60.000 hours

Electrical Details

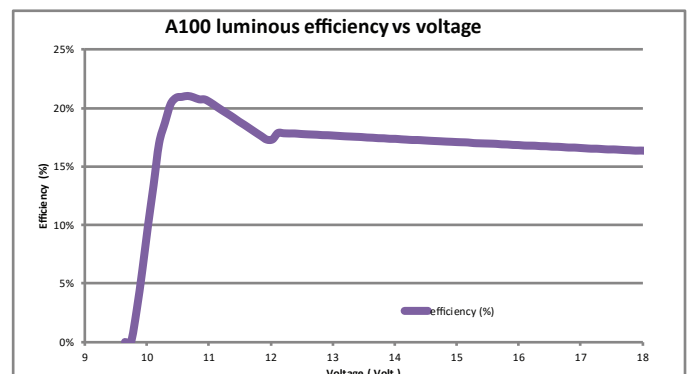
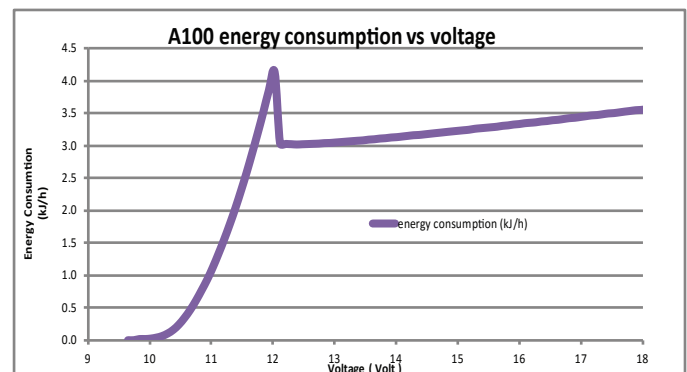
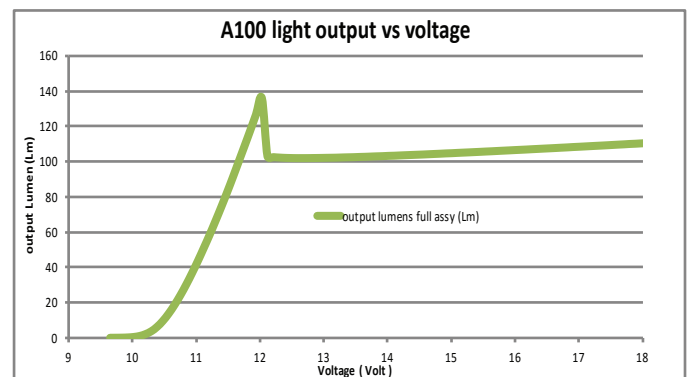
Safe Input Voltage Range	12 - 16 VDC
Max Operating Current	93mA

Mechanical and Environmental Details

Connector System	Sundaya 12V PlugCable System
Enclosure Material	ABS
Lens Material	PC
Connector Material	Nickel Plates Brass
Dimensions	50mm Diameter x 40mm Height
Product Mass	16.5 gr
Packaging Options	Individual Packing or as part of JouleBox kits

Protection

Input Reverse Polarity protection	YES
Enclosure protection class	IP 54
CE Compliance	YES



A200 / Ulite200

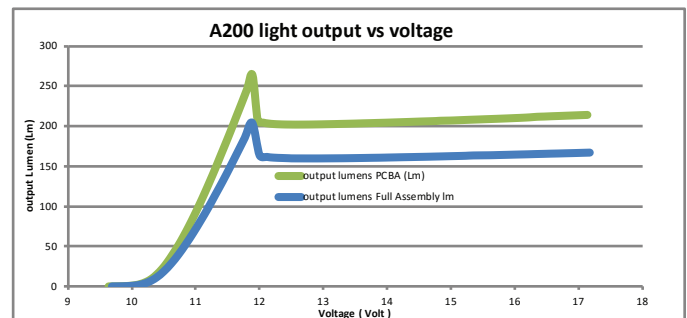
Product Specifications
PS-A200-01/01-180716

The A200 is a DC Light bulb based on ultra efficient Light Emitting Diode Technology that can operate within a DC Voltage range of 12 up to 16 V. The Ulite is connected through a unique plug and play cabling system that allows for a very quick installation, Change of lamp and cable extension. The Ulite has a highly diffused lens to give a non glare and equally distributed light output that is safe for the eyes.



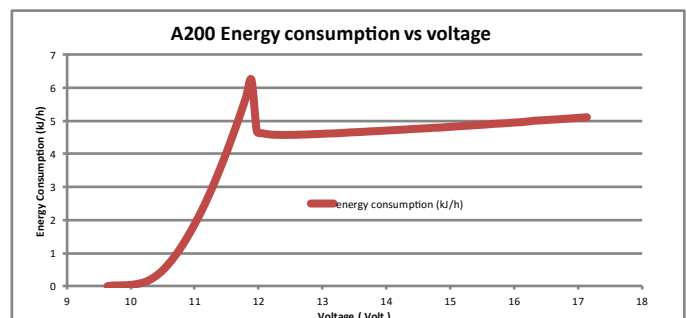
Ulite Performance

Minimum Light Output (between 12-18V operating range)	200 Lumen
Color Temperature	5000K (Cool White)
Average Electricity to Light Conversion efficiency (of Light Engine)	24%
Average Electricity to Light Conversion efficiency (Including Diffusor)	20%
Maximum Energy Consumption	7 kJ/h (1.9W)
Energy Consumption stated on product	7 kJ/h
Lumen Maintenance (down to 70% of original value)	60.000 hours



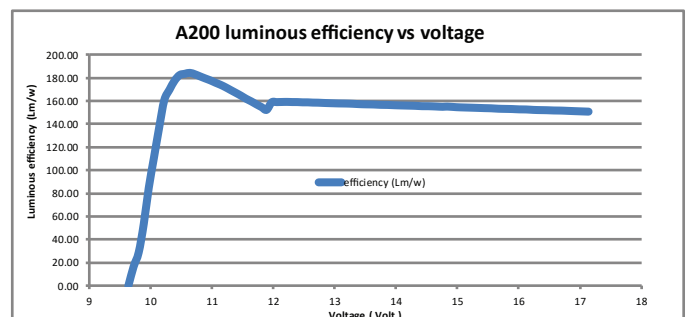
Electrical Details

Safe Input Voltage Range	12 - 16 VDC
Max Operating Current	185 mA



Mechanical and Environmental Details

Connector System	Sundaya 12V PlugCable System
Enclosure Material	ABS
Lens Material	PC
Connector Material	Nickel Plates Brass
Dimensions	65mm Diameter x 55mm Height
Product Mass	30 gr
Packaging Options	Individual Packing or as part of JouleBox kits



Protection

Input Reverse Polarity protection	YES
Enclosure protection class	IP 54
CE Compliance	YES

A400 / Ulite400

Product Specifications
PS-A400-01/01-180716

The **Ulite** is a DC Light bulb based on ultra efficient Light Emitting Diode Technology that can operate within a DC Voltage range of 12 up to 16 V. The Ulite is connected through a unique plug and play cabling system that allows for a very quick installation, Change of lamp and cable extension. The Ulite has a highly diffused lens to give a non glare and equally distributed light output that is safe for the eyes.



Ulite Performance

Minimum Light Output (between 12-18V operating range)	400 Lumen
Color Temperature	5000K (Cool White)
Average Electricity to Light Conversion efficiency (of Light Engine)	22%
Average Electricity to Light Conversion efficiency (Including Diffusor)	17%
Average Energy Consumption	13 kJ/h (3.6W)
Energy Consumption stated on product	13 kJ/h
Lumen Maintenance (down to 70% of original value)	60.000 hours

Electrical Details

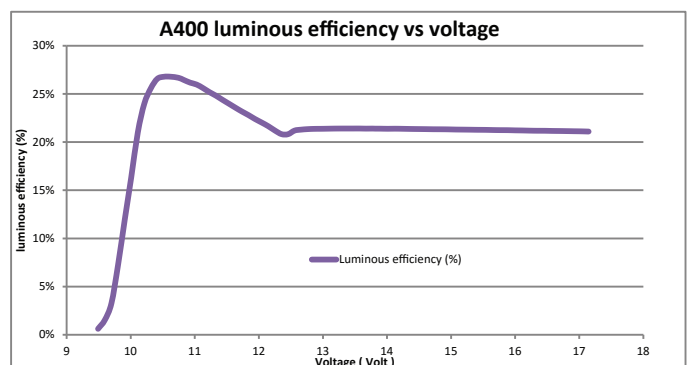
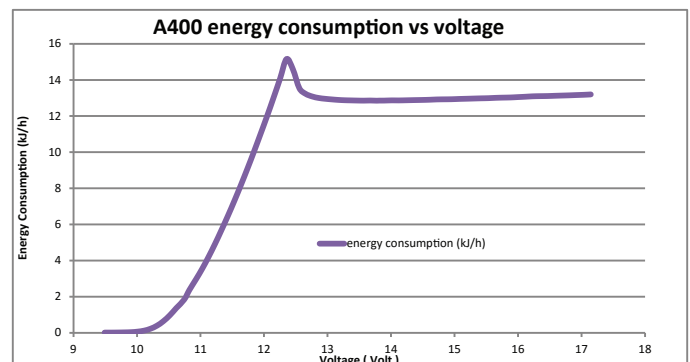
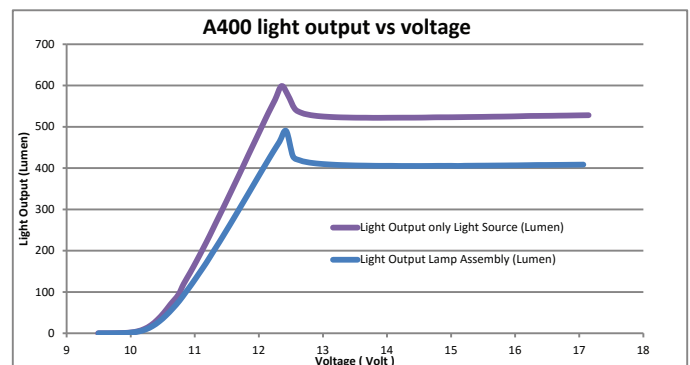
Safe Input Voltage Range	12 - 16 VDC
Max Operating Current	370 mA

Mechanical and Environmental Details

Connector System	Sundaya 12V PlugCable System
Enclosure Material	ABS
Lens Material	PC
Connector Material	Nickel Plated Brass
Dimensions	80mm Diameter x 68mm Height
Product Mass	41 gr
Packaging Options	Individual Packing or as part of JouleBox kits

Protection

Input Reverse Polarity protection	YES
Enclosure protection class	IP 54
CE Compliance	YES



A600 / Ulite600

Product Specifications
PS-A600-01/01-180716

The **A600** is a DC Light bulb based on ultra efficient Light Emitting Diode Technology that can operate within a DC Voltage range of 12 up to 16 V. The **Ulite** is connected through a unique plug and play cabling system that allows for a very quick installation, Change of lamp and cable extension. The **Ulite** has a highly diffused lens to give a non glare and equally distributed light output that is safe for the eyes.



Ulite Performance

Minimum Light Output (between 12-18V operating range)	600 Lumen
Color Temperature	5000K (Cool White)
Average Electricity to Light Conversion efficiency (of Light Engine)	20%
Average Electricity to Light Conversion efficiency (Including Diffusor)	16%
Average Energy Consumption	21 kJ/h (5.8W)
Energy Consumption stated on product	21 kJ/h
Lumen Maintenance (down to 70% of original value)	60.000 hours

Electrical Details

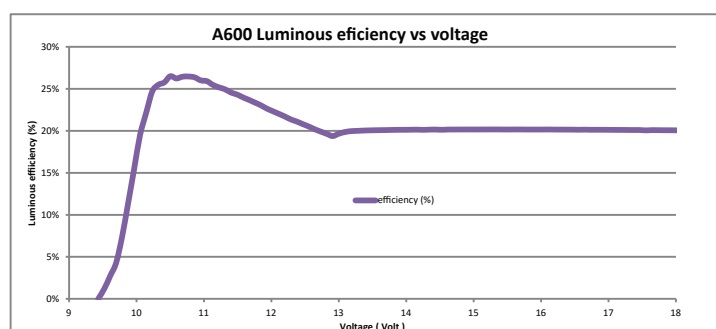
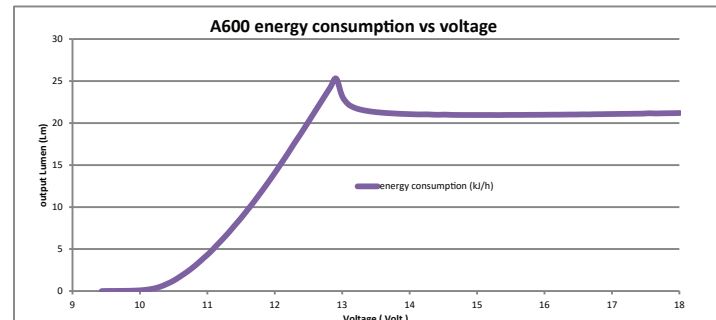
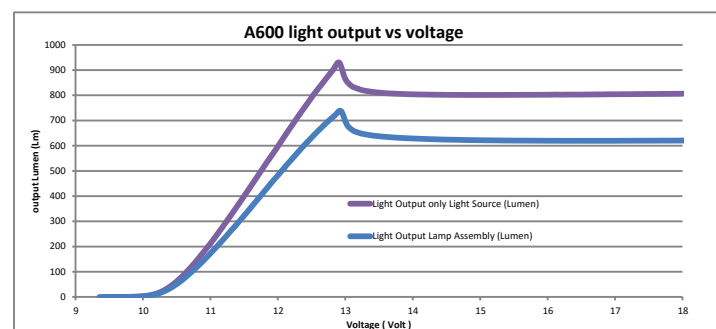
Safe Input Voltage Range	12 - 16 VDC
Max Operating Current	545 mA

Mechanical and Environmental Details

Connector System	Sundaya 12V PlugCable System
Enclosure Material	ABS
Lens Material	PC
Connector Material	Nickel Plated Brass
Dimensions	80mm Diameter x 68mm Height
Product Mass	41 gr
Packaging Options	Individual Packing or as part of JouleBox kits

Protection

Input Reverse Polarity protection	YES
Enclosure protection class	IP 54
CE Compliance	YES



Ceiling Fan500

Product Specifications
PS-CeilingFan500-01/01-170616

The **Ceiling Fan** is a DC application based on brushless motor Technology that can operate within a DC Voltage range of 12 up to 18 V for JouleBox system. The **Ceiling Fan** is connected through a unique plug and play cabling system that allows for a very quick installation, Change of **Ceiling Fan** with other application and cable extension.

Ceiling Fan Performance

Average Energy Consumption	20 kJ/h (5.5W)
Energy Consumption stated on product	20 kJ/h
Optimal Application	<10 m ²

Electrical Details

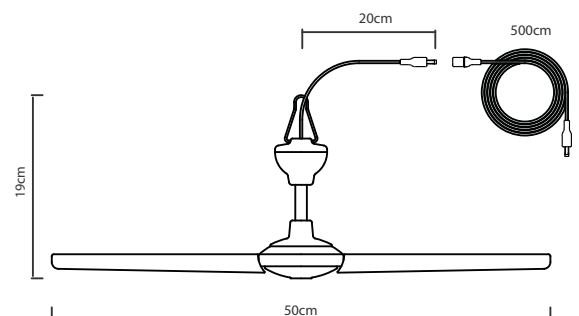
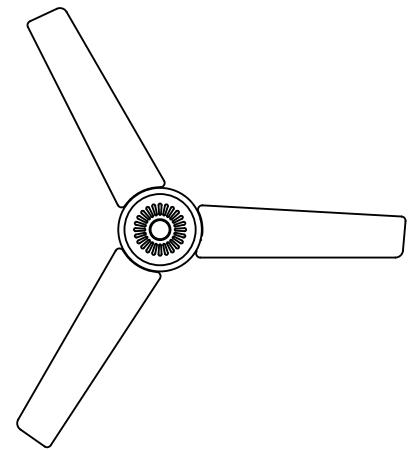
Safe Input Voltage Range	12 - 18 VDC
Max Operating Current	500 mA

Mechanical and Environmental Details

Connector System	Sundaya 12V PlugCable System
Material	ABS
Connector Material	Nikle Plated Brass
Dimensions	500mm Diameter x 190mm Height
Product Mass	200 gr
Packaging Options	Individual Packing

Protection

CE Compliance	YES
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2F to MCable 1m

Product Specifications
PS-2FtoMCable-01/01-190716

General

Product Name	2F to MCable
Product Description	Installation cable for JouleBox Kits Solar Home Systems

Electrical Details

Max Rated Voltage	75 V
Resistance at 20 °C	84.20 Ohm/km
Max. Permissible Current	4 A
Contact Resistance	≤ 0.03 Ohm
Electrical Strength	Retardant anti aging PVC

Mechanical Details

Conductor Material	Standard Bare Copper Wire
Section Area	2 x 0.2 mm ²
Copper wire size (nxØ wire)	2 x 11 x 0.15 mm
Insulation Thickness	0.21 mm
Overall Dimensions	Ø 3.0 mm
Shielding	PVC (fire retardant)
Color	Black
Tensile Strength	Min. 11Mpa
Elongation	Min. 190%

Thermal aging (80°C ± 2°C, 7x24hr)

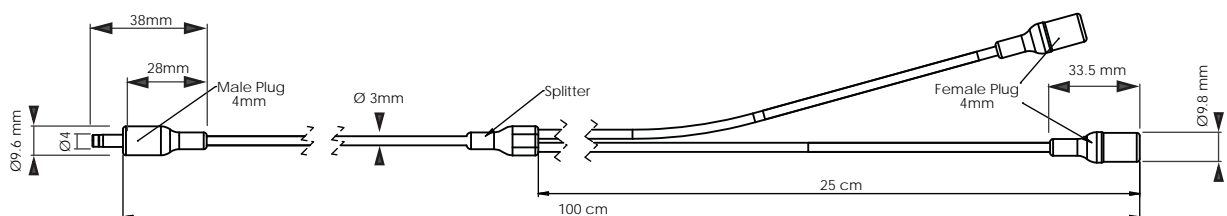
-Tensile strength	Retention rate compared to before heating 60%
-Elongation	Retention rate compared to before heating 70%

Heat Shock	No cracks or flaws on the surface
Cold Bend	No cracks or flaws on the surface
Heat Deformation	Thickness not to exceed 30%
Flame Retardance	Flame to go out naturally within 60 sec.

Properties of Conductor Copper Wire

-Elongation	min. 15%
-Electrical Conductivity	min. 98%

Standard Packaging	1 meter, 5 meters
Packing Option	Individual packaging or part of JouleBox Kits
Female Plug Inner diameter	Ø 4.0 mm
Female Plug Pin diameter	Ø 1.7 mm
Male Plug Outer diameter	Ø 4.0 mm



PlugCable5m

Product Specifications
PS-PlugCable5m-01/01-270616

General

Product Name	PlugCable
Product Description	Installation cable for JouleBox Kits Solar Home Systems

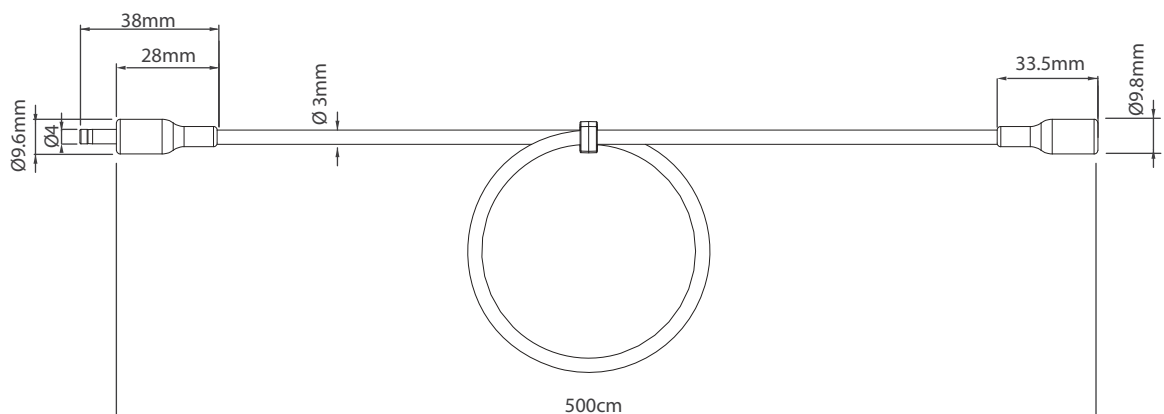
Electrical Details

Max Rated Voltage	75 V
Resistance at 20 °C	84.20 Ohm/km
Max. Permissible Current	4 A
Contact Resistance	≤ 0.03 Ohm
Electrical Strength	Retardant anti aging PVC



Mechanical Details

Conductor Material	Standard Bare Copper Wire
Section Area	2 x 0.2 mm ²
Copper wire size (nxØ wire)	2 x 11 x 0.15 mm
Insulation Thickness	0.21 mm
Overall Dimensions	Ø 3.0 mm
Shielding	PVC (fire retardant)
Color	Black
Tensile Strength	Min. 11Mpa
Elongation	Min. 190%
Thermal aging (80°C ± 2°C, 7x24hr)	
-Tensile strength	Retention rate compared to before heating 60%
-Elongation	Retention rate compared to before heating 70%
Heat Shock	No cracks or flaws on the surface
Cold Bend	No cracks or flaws on the surface
Heat Deformation	Thickness not to exceed 30%
Flame Retardance	Flame to go out naturally within 60 sec.
Properties of Conductor Copper Wire	
-Elongation	min. 15%
-Electrical Conductivity	min. 98%
Standard Packaging	5 meters
Packing Option	Individual packaging or part of JouleBox Kits
Female Plug Inner diameter	Ø 4.0 mm
Female Plug Pin diameter	Ø 1.7 mm
Male Plug Outer diameter	Ø 4.0 mm



PlugCable1m

Product Specifications
PS-PlugCable1m-01/01-270616

General

Product Name	PlugCable
Product Description	Installation cable for JouleBox Kits Solar Home Systems

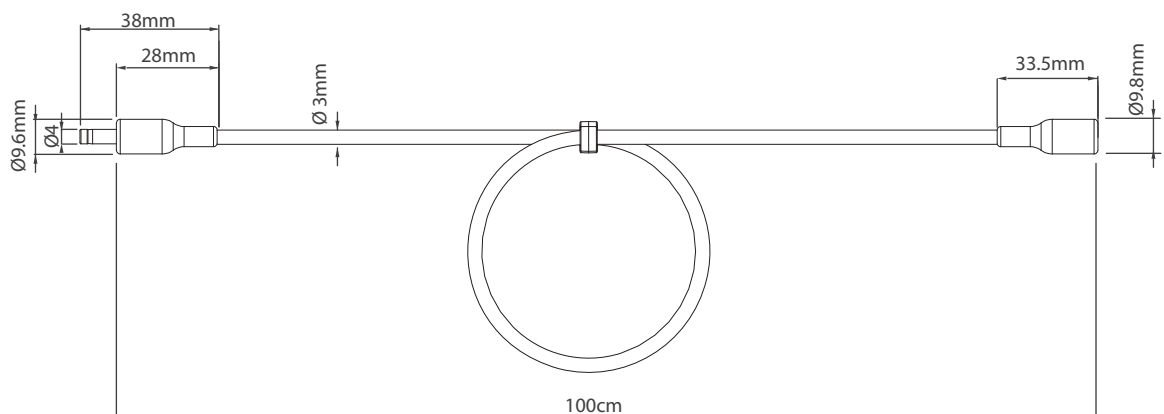
Electrical Details

Max Rated Voltage	75 V
Resistance at 20 °C	84.20 Ohm/km
Max. Permissible Current	4 A
Contact Resistance	≤ 0.03 Ohm
Electrical Strength	Retardant anti aging PVC



Mechanical Details

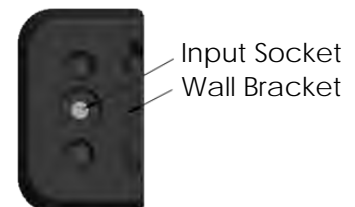
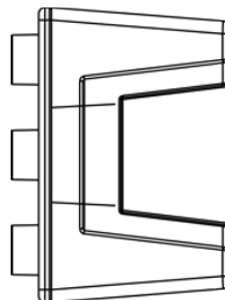
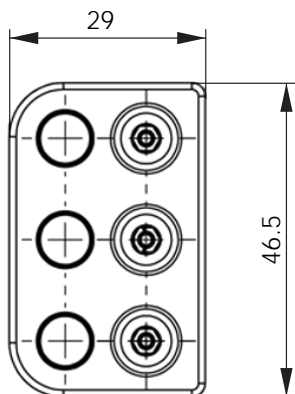
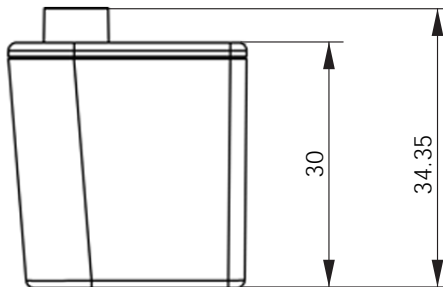
Conductor Material	Standard Bare Copper Wire
Section Area	2 x 0.2 mm ²
Copper wire size (nxØ wire)	2 x 11 x 0.15 mm
Insulation Thickness	0.21 mm
Overall Dimensions	Ø 3.0 mm
Shielding	PVC (fire retardant)
Color	Black
Tensile Strength	Min. 11Mpa
Elongation	Min. 190%
Thermal aging (80°C ± 2°C, 7x24hr)	
-Tensile strength	Retention rate compared to before heating 60%
-Elongation	Retention rate compared to before heating 70%
Heat Shock	No cracks or flaws on the surface
Cold Bend	No cracks or flaws on the surface
Heat Deformation	Thickness not to exceed 30%
Flame Retardance	Flame to go out naturally within 60 sec.
Properties of Conductor Copper Wire	
-Elongation	min. 15%
-Electrical Conductivity	min. 98%
Standard Packaging	1 meters
Packing Option	Individual packaging or part of JouleBox Kits
Female Plug Inner diameter	Ø 4.0 mm
Female Plug Pin diameter	Ø 1.7 mm
Male Plug Outer diameter	Ø 4.0 mm



HUB3

Product Specifications
PS-HUB3-01/01-210716

HUB3 is a Sundaya plug & play interconnection box with additional expansion terminal that compatible with JouleBox Kit Solar Home System.



Electrical details

Rated Voltage	30 V
Rated Current	1.0 A
Insulation Resistance	≥ 500 M Ohm
Contact Resistance	≤ 0.03 Ohm

Mechanical Details

Mechanical Lifetime	More than 10.000 cycles
Operating Temperature Range	-25 C to +85 C
Enclosure Material	ABS
Connector Material	Nickel Plates Brass
Dimension (L x W x H)	46.5 x 29 x 34.35 mm
Nett Product Weight	20 gr

PlugSwitch

Product Specifications
PS-Plugswitch-01/01-190716

General

Product Name	PlugSwitch
Product Description	Installation cable for JouleBox Kits Solar Home Systems

Electrical Details

Max Rated Voltage	75 V
Resistance at 20 °C	84.20 Ohm/km
Max. Permissible Current	4 A
Contact Resistance	≤ 0.03 Ohm
Electrical Strength	Retardant anti aging PVC

Mechanical Details

Mechanical Life Time	More than 10.000 cycle
Conductor Material	Standard bare copper wire
Section Area	2 x 0.2 mm ²
Copper wire size (nxØ wire)	2 x 11 x 0.15 mm
Insulation Thickness	0.21 mm
Overall Dimensions	Ø 3.0 mm

Shielding	PVC (fire retardant)
Color	Black
Tensile Strength	Min. 11Mpa
Elongation	Min. 190%

Thermal aging (80°C ± 2°C, 7x24hr)

-Tensile strength	Retention rate compared to before heating 60%
-Elongation	Retention rate compared to before heating 70%

Heat Shock	No cracks or flaws on the surface
Cold Bend	No cracks or flaws on the surface
Heat Deformation	Thickness not to exceed 30%
Flame Retardance	Flame to go out naturally within 60 sec.

Properties of Conductor Copper Wire

-Elongation	min. 15%
-Electrical Conductivity	min. 98%

Packing Option

Female Plug Inner diameter	Ø 4.0 mm
Female Plug Pin diameter	Ø 1.7 mm
Male Plug Outer diameter	Ø 4.0 mm

