

**PHILIPS**

Solar Lighting

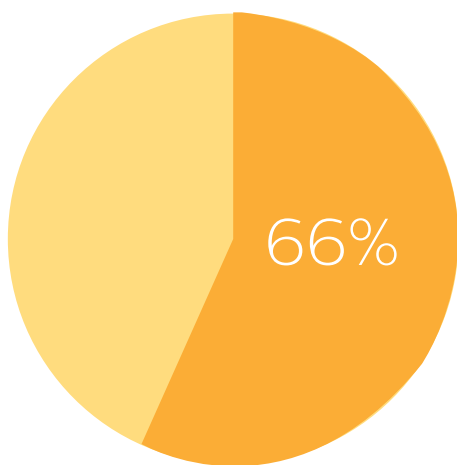
# Here comes the sun



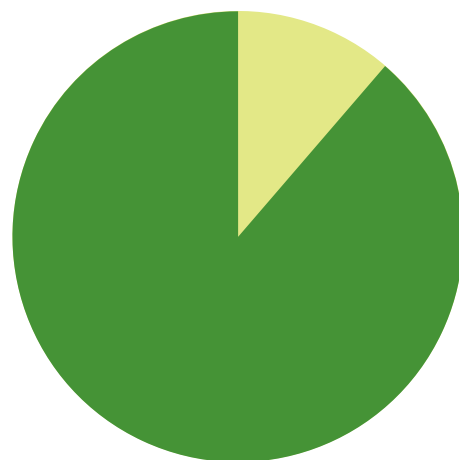
# Rapid urbanisation is fast depleting the resources

Rapid urbanisation and population growth are putting more pressure on resources. This is reflected in the environmental impact of cities; as they consume over two thirds of the world's energy and account for more than 70% of global CO<sub>2</sub> emissions. Cities must now reduce their environmental impact.

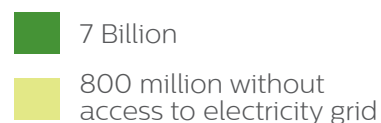
On the other hand, more than 800 million people do not have access to a electricity grid. Darkness affects the quality of life at night and reduces public safety on roads and streets.



Energy Consumption  
by urban population



Total world population



# Solar lighting is sustainable, green, and clean

Hybrid solar opens new opportunities in Northern Europe. It gives organisations an opportunity to reduce their carbon footprint and generate more of the energy needed to run their estate locally through renewable energy.



Enhanced sustainability potential



Show residents, employees and customers that you are investing in green technology



Significant energy savings



Reduce energy costs



Increased sense of safety and security



Class III SELV luminaires



Less dependent on the power grid



Low maintenance



More efficient city planning and operations



Improved city services

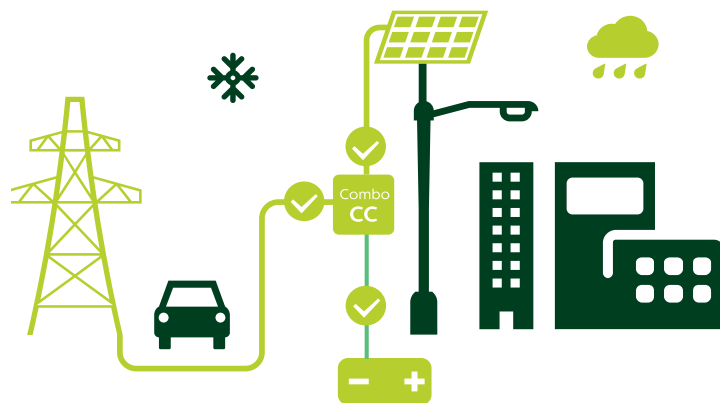
# Our solar lighting propositions



## Hybrid solar

- For existing grid connected light points

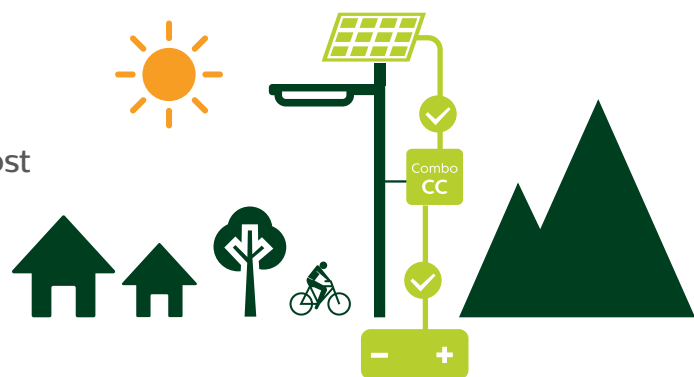
This system is like the off-grid solar system but is connected to a power grid. The solar panels charge the batteries during the day and the stored energy powers the LEDs at night. If the batteries run out of power, the LEDs are powered with energy drawn from the power grid.



## Off grid solar

- Saving cabling and distribution switchgear cost

This system consists of luminaries, solar panels and batteries designed to operate autonomously without any connection with an electrical grid. The solar panels charge the batteries during the day and the stored energy powers the LEDs at night.



\*Not recommended for use in the UK & Ireland where lighting is essential for safety.

# Philips Solar Hybrid

## Reliable operations under diverse conditions



### Benefits

- Confidence that your solar lighting will work all year round
- A wide range of optics to suit your project
- Minimise emissions and scale up the use of renewables
- Luminaires from the world's first carbon neutral lighting manufacturer

### Application areas

- Car parks
- Footpaths
- Parks
- Residential areas
- Building exteriors

# The quickest path to a greener, smarter, more prosperous UK

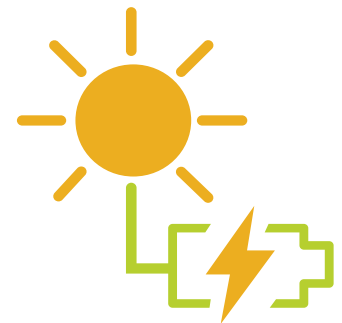


With more than half of UK local authorities declaring a climate emergency, it has never been more important to consider how to decarbonize the estates of both public and private organisations.

Reconciling the economy and the way we consume resources, and ultimately becoming carbon neutral or even carbon negative, will require investment into new technology.

Switching to a solar-powered LED luminaire could help business-owners and stakeholders within local authorities reduce the amount of energy required from the grid to run their estate. By looking at their lighting assets in a new way, their carbon footprint and operating expenditure can be reduced.

## Clean energy with solar hybrid street lighting



More than 25% of the UK's CO<sub>2</sub> emissions come from energy supply. This means that for the UK to become carbon neutral it must decarbonize its energy system to reach its climate objectives.

- Solar and hybrid street lighting minimise emissions and scale up the use of renewables
- Hybrid-solar technology uses clean solar-powered electricity when there is sunlight, and the mains grid when there is not

Infrastructure projects such as connected street lighting retrofits create on average 19 local jobs for every €1 million spent, benefitting the environment and the economy and building the digital platforms needed to ensure a green future.



# Philips range of **Solar lighting solutions**



## <5k lumens

- Pathways
- Rural areas
- Parks



## 5k-8k lumens

- Parks
- Plazas
- Cycle tracks



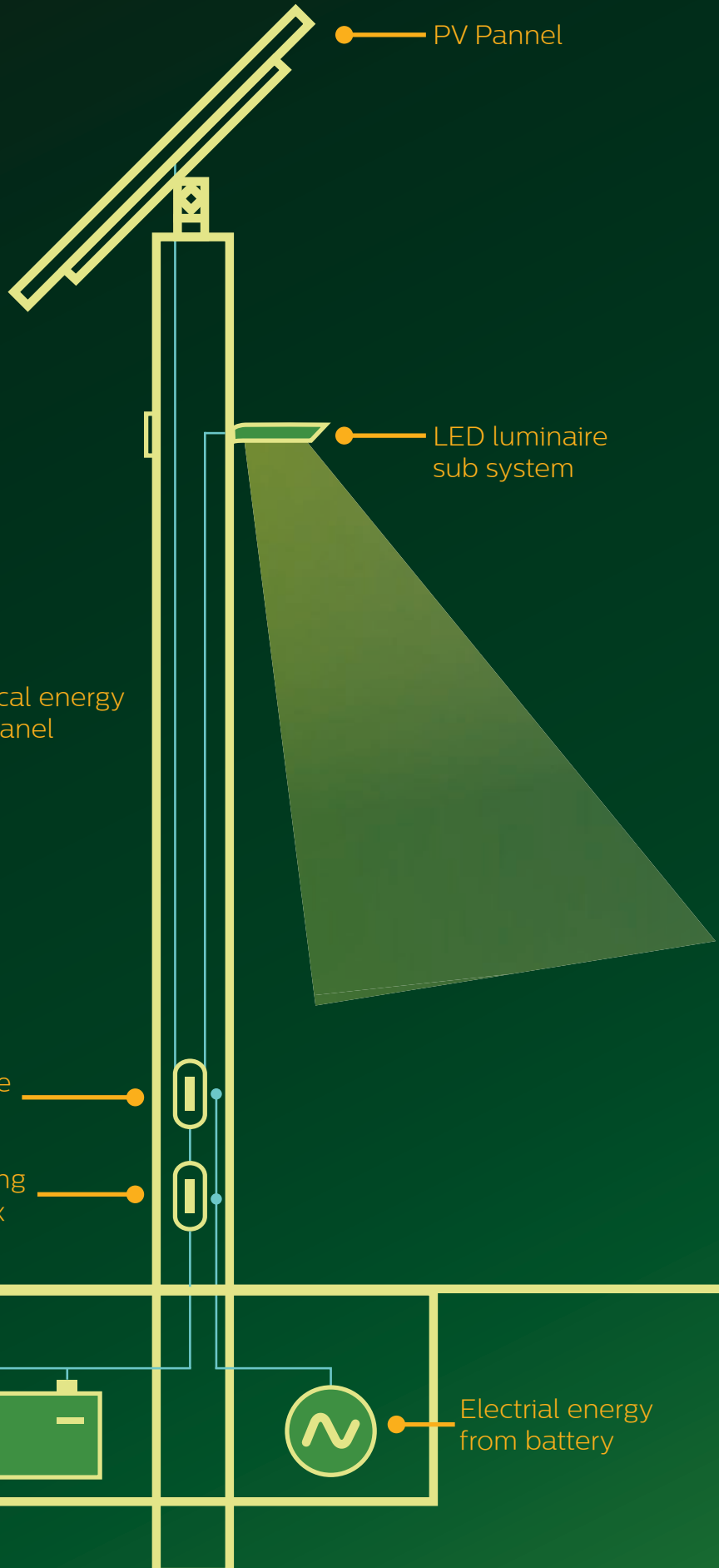
## 8k-15k lumens

- Office campuses
- Suburban roads
- Inner city roads



# Table of **contents**

Luma gen2 Solar	14
LumiStreet gen2 Solar	16
Combo charge controller Gen4.0	18
Solar battery sub systems	20
Solar panel sub systems	24



When the sun shines during the day, the solar panel converts solar energy to electrical energy and stores it in the battery.

During the night, the battery is discharged, releasing electrical energy to power the LED luminaire.

If battery is not adequately charged or it drains out during the night, solar hybrid input will kick in automatically.

Electrical energy from panel

Combo charge controller

Hybrid charging unit +SPD box

Battery sub system

Electrical energy from battery

# Philips outdoor luminaires



**LumiStreet gen2 solar**  
solar street lighting

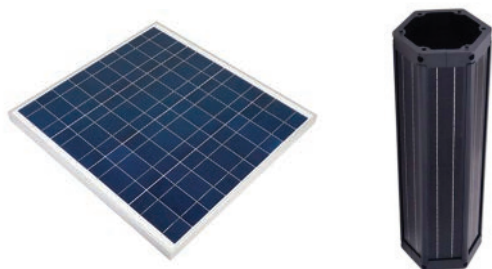
2000-15000 lumen



**Luma gen2 Solar**  
solar street lighting

2000-15000 lumen

# Solar sub systems



## PV panel sub systems

- for 12V and 24V systems
- 30Wp-325Wp flat panel
- 100-190Wp vertical panel



## Battery sub systems

Gel batteries

- 12V and 24V
- 65-250Ah
- 800 cycles at 70% DOD
- IP68 rated

LiFePO<sub>4</sub> batteries

- 12.8V and 25.6V
- 50-180Ah
- 2000 cycles at 90% DOD
- IP68 rated



## Combo CC Gen4.0

- 200Wp, 400Wp and 600Wp versions
- Support Gel and LiFePO<sub>4</sub> batteries
- Offgrid and hybrid solar



## Cables and connectors

- Waterproof IP67 connectors
- Plug and play, easy installation
- Error-proof to avoid the mistake of onsite installation
- Different length of cables are available for various application





# Luma gen 2 Solar

## Using Solar power to light up your streets

Help meet your sustainability goals whilst still using market leading luminaires. Luma gen2 uses Ledgine O optics to give you the perfect light distribution for your project.

## Product features

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- Dedicated Philips Solar sub-systems like Charge Controller, Battery, PV panel, connecting cables with IP67 connectors enabling faster, safer, installation and maintenance
- New cable feedthrough for easy installation
- Tilt now with 2,5 degrees precision
- Choice of 40+ different beams and option of different internal louvers

## Product benefits

- Compatible with a wide range of PHILIPS Solar sub-systems which include Battery, PV Panel, Charge Controller
- Customisable lighting solutions to suit your exact needs thanks to Ledgine – O
- Best in class efficiency and light performance in a broad range of applications
- Improved serviceability thanks to Service tag, a QR-based identification system that makes each luminaire uniquely identifiable and provides maintenance, installation and spare part information
- Redesigned cable feed-through for tool-less access to the connection compartment
- Luminaire lifetime >L95B10 @ 100k hrs
- Tool-less opening
- Range of mounting options with a universal spigot

## Technical specifications

Specifications	VGP703	VGP704
<b>System wattage (W)</b>	7- 50W	40 - 85W
<b>System efficacy (lm/W)</b>	Up to 165lm/W	Up to 165lm/W
<b>Lumen output (lm)</b>	2000 - 7500lm	6000lm - 15000lm
<b>Housing</b>	Aluminium pressure die cast	
<b>Color temperature (K)</b>	3000, 4000	
<b>CRI</b>	70, 80	
<b>IP rating</b>	IP66	
<b>IK rating</b>	IK10	
<b>Cover</b>	Glass cover	
<b>Mounting</b>	Post top and side entry, 32-60mm dia or 60 - 76mm dia.	
<b>Mains voltage</b>	24V	48V





# LumiStreet gen2 solar

## Power your road lighting by solar energy

Thanks to its energy efficiency and low initial cost, LumiStreet gen2 solar enables you to start investing in sustainable technology in a more cost-effective way.

LumiStreet gen2 solar comes with Ledgine O optics ensuring that you can always find the optimal light distribution. Thanks to Service Tag, you can view the luminaire's specification at any time on site through your phone. You can also view mounting instructions and a list of spare parts should you require them.

## Product features

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- Dedicated Philips Solar sub-systems like Charge Controller, Battery, PV panel, connecting cables with IP67 connectors enabling faster, safer, installation and maintenance
- Wide application coverage thanks to numerous different optics, extensive range of flux and tiltable spigot
- Easy luminaire identification and hassle-free maintenance thanks to Service tag
- Increased shock resistance with optional IK09 glass cover



## Product benefits

- Compatible with a wide range of PHILIPS Solar sub-systems which include Battery, PV Panel, and Charge Controller
- 1 to 1 replacement for conventional luminaires
- High energy efficiency
- Low TCO (Total Cost of Ownership)
- Made of high-quality materials for longer lifetime and minimized maintenance

## Technical specifications

Specifications	VGP282	VGP283
<b>System wattage (W)</b>	7 - 48W	40 - 85W
<b>System efficacy (lm/W)</b>	up to 160lm/W (740)	up to 160lm/W (740)
<b>Lumen output (lm)</b>	2000 - 7500lm	6000lm - 15000lm
<b>Housing</b>	Aluminium pressure die cast	
<b>Color temperature (K)</b>	3000, 4000	
<b>CRI</b>	70, 80	
<b>IP rating</b>	IP66	
<b>IK rating</b>	IK08 with optional IK09	
<b>Cover</b>	Glass cover	
<b>Mounting</b>	Post top and side entry, 32-60mm dia or 60 - 76mm dia.	
<b>Mains voltage</b>	24V	48V





# Combo CC Gen4.0

## Configurable and smart solar charge controllers.

Combo CC Gen 4.0 is a range of MPPT solar charge controllers suitable for solar lighting in a wide range of applications. High system efficacy, optimised design and long life ensures lower cost of ownership. On site configuration and parameter ready with a BLE mobile app.

## Configurable and easy to operate

### High system efficacy

- Integrated LED driver enables high system efficacy
- MPPT charging algorithm for maximum efficiency
- Temperature compensation for batteries

### Best in class

- Onsite programming and configuration with GUI for panel, battery and dimming profile.
- Protections inbuilt for solar sub systems
- Multiple battery types supported

### Optimized design

- Metal weatherproof IP65 housing with IP67 connectors
- Plug and play poka - yoke connectors for error free connections
- Tactile and audible mating feedback

## Product benefits

- Three different platforms: 200Wp, 400Wp and 600Wp
- Can drive luminaires from 5000 to 15000 lumens
- Sturdy construction for long life

## Technical specifications

Specifications	ZJS401 CCC 200Wp	ZJS402 CCC 400Wp	ZJS403 CCC 600Wp
Maximum charging current	17A		20A
Maximum LED Wattage	50W	80W	180W
Maximum load current	2.5A	1.7A	3.2A
System voltage	12V	24V	12V/24V
IP Rating	IP65		IP67
Configurable parameters	Dusk and dawn operation, battery type, load wattage, dimming profile, RTE.		
LED indications	Battery charging, load ON, battery deep discharge, fault alert.		
Configuration	BLE mobile app for configuration of charge controller (with BLE dongle accessory)		Wireless remote/ Laptop





# Solar battery sub systems - GEL

## Range of high performance batteries

A range of 65Ah to 250Ah 12V/24V, valve regulated lead acid (VRLA) battery with gel electrolyte technology to get long service lifetime and high performance. It can be used in wide ambient temperature range and delivers high performance.

## Advanced technology for high performance

### Gel electrolyte technology

- Robust lifetime and high performance deep discharging

### Wide range of ambient temperature

- Good performance of constant power input

### Robust connections

- IP67 connectors
- Plug and play design for easy wiring
- Tactile and audible mating feedback

## Product benefits

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- Gel electrolyte
- Excellent capacity restoration, 95% capacity recovery after short circuit in 24 hours
- Low self-discharge rate, less than 3% per month
- Wide application temperature range, -20°C to 55°C
- High charge efficiency, good small current charge absorption ability
- Water-proof, patented design, that enable underground battery installation
- Ventilation pipe, release the gas from battery to the air for safe operation

## Technical specifications

Specifications	XGS321/XGS322
Battery chemistry	Gel
Capacity	65Ah to 250Ah
Housing	IP68
Mounting	Dependent on location
Battery Voltage	12V and 24V
Connections	3 m cable with IP67 MC4 and KB 1 connectors
Charging temp.	-20°C to 55°C
Discharging temp.	-20°C to 55°C
Self discharge rate	< 3% / month @25 degree celsius
Life Cycle	>800 cycles at 70% daily DOD





# Solar battery sub systems-LiFePO<sub>4</sub>

## Range of high performance batteries

Lithium ferro phosphate battery integrates highly efficient technology to get long service lifetime, high performance in deep discharging. Inbuilt battery management system for protection and safe operations. It can be used in wide range of ambient temperature delivering constant power output.

## Advanced technology for high performance

LiFePO <sub>4</sub> technology	Safe	Robust
<ul style="list-style-type: none"> <li>· Long service lifetime and high performance in deep discharging</li> <li>· 2000 cycles at 90% DOD</li> </ul>	<ul style="list-style-type: none"> <li>· Over charging/discharging protection</li> <li>· Short circuit protection</li> <li>· Cell balancing</li> <li>· Temperature high/low cut offs</li> </ul>	<ul style="list-style-type: none"> <li>· Environmentally sealed to IP68</li> <li>· Suitable for a range of installation options</li> </ul>

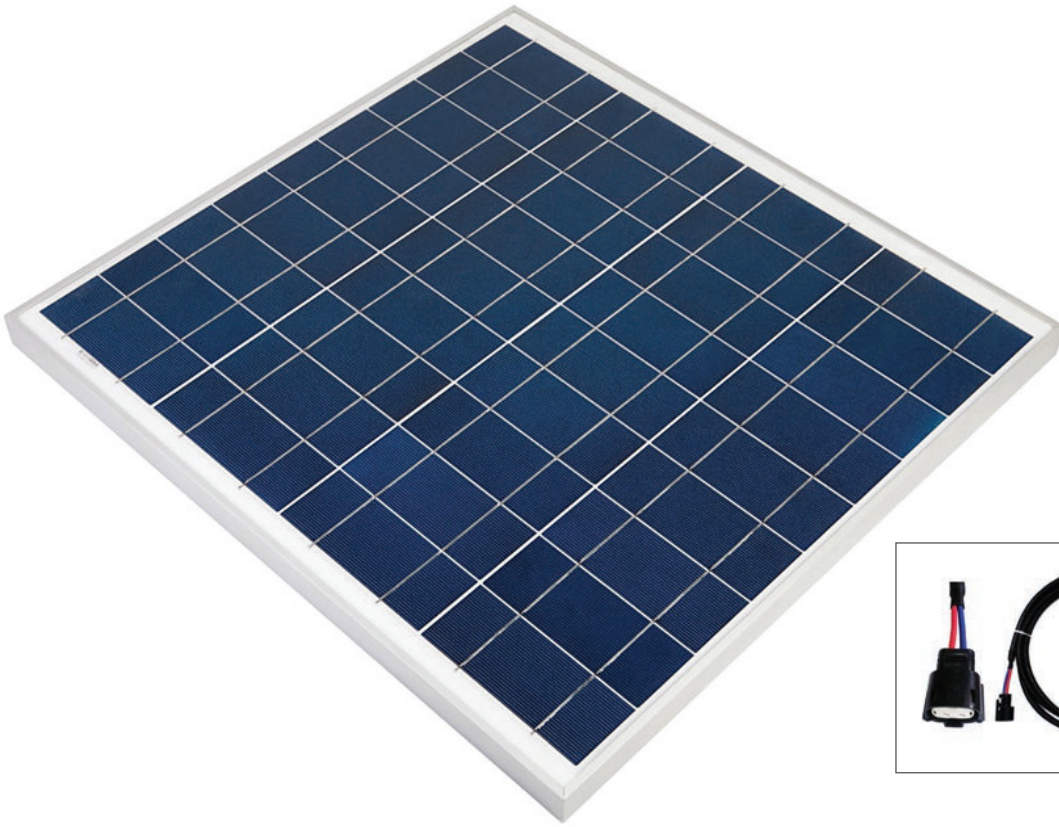
## Product benefits

- Range of mounting options
- Available in 12.8V and 25.6V systems
- Wide operating temperature range from 0 to 60° C
- Plug and play design for easy connection and installation

## Technical specifications

Specifications	ZJS601
Battery chemistry	Lithium ferro phosphate
Capacity	50Ah to 160Ah
Housing	IP68
Mounting	Range of installation options available. Pole mounting kit available as an accessory.
Battery Voltage	12.8V and 25.6V
Connections	3 m cable with IP67 MC4 and KB1 connectors
Charging temp.	0°C to 60°C
Discharging temp.	-20°C to 60°C
Life Cycle	2000 cycles at 90% DoD





# Solar panel sub systems

## Range of high performance solar panels

A range of solar panels from 30W to 325W specially designed for Philips solar street lighting.

## Long lasting performance

### Long life

- Connectors with excellent aging resistance and UV endurance, for harsh environment operations
- 25+ years life class

### Weatherproof

- Wide temperature range of  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$
- IP67 connector

### Safe

- Specially designed for Philips solar charge controllers
- Tested in accordance with Philips quality policy



## Product benefits

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- Robust quality managed by Philips quality discipline
- Range of options to suit your projects energy requirements
- Plug and play design for easy connection and installation

## Technical specifications

Specifications	ZJS601
Panel wattage (Wp)	30 to 325
System voltage	Range available for 12V and 24V system voltage
Temperature Range	-40°C to +80°C
PV type	Polycrystalline silicon
Connection cables	Cable 1.0 m 4.0 sqm, 3m to 14.5m extension accessory available
IP rating	IP67
Mounting	On column top - mounting frame required from column manufacturer





# Solar panel sub systems

## Vertical solar panels

A range of solar panels from 100Wp to 190Wp specially designed for Philips solar street lighting.

## Redefining urban scape

### 360° full day charging

- 360° solar panel ensure full day sunlight capture
- Works efficiently at higher latitudes due to vertical position
- Monocrystalline technology for maximum efficiency

### Nice visual appearance

- Sleek hexagonal vertical design
- Low wind resistance offers flexibility of choosing poles
- Visually appealing installations

### Weatherproof

- Resistant to dust, dirt and snow accumulation due to vertical design
- Better resistance to snowy weather

## Product benefits

- Cylindrical design eliminates the chances of accumulation of dust, hence delivers more power
- Plug and play design for easy connection and installation
- Aesthetically pleasing installation for heritage sites
- Very large solar panel size possible due to low wind resistance and modular installations

## Technical specifications

Specifications	ZJS601
Panel wattage (Wp)	100, 140 and 190
System voltage	12V and 24V
Temperature Range	-40°C to +85°C
PV type	Monocrystalline
Connection cables	Cable connection kit Included, 3m to 14.5m extension accessory available
IP rating	IP66
Material	Aluminium bracket and tempered glass covering
Mounting	Along the height of pole



# Abbreviations

<b>LMLA GEL:</b>	low Maintenance Lead Acid (batteries)
<b>CRI:</b>	color rendering index
<b>CCT:</b>	corelated color temperature
<b>PV:</b>	photovoltaics
<b>LM:</b>	lumen
<b>K:</b>	kelvin
<b>Ah:</b>	ampere hour
<b>A:</b>	ampere
<b>Hz:</b>	hertz
<b>V:</b>	volts
<b>Wh:</b>	watt hour
<b>BLE:</b>	bluetooth low energy
<b>W:</b>	watts
<b>IP:</b>	ingress protection
<b>IK:</b>	impact protection
<b>LiFePO4:</b>	lithium ferro phosphate
<b>C :</b>	celsius
<b>LED:</b>	light emitting diode.
<b>DIY:</b>	do it yourself.
<b>RMU:</b>	remote monitoring unit.
<b>RTE :</b>	run time extension.
<b>DOD :</b>	depth of discharge
<b>m:</b>	metres





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