



Solar Street Lights (LED)



Introduction to Solar Street Lights:

Electric Street Lights are big consumers of energy, costing millions to cities and municipalities around the world. Solar Street Lights were initially used mainly in Third World countries, in remote areas or where electricity is not always available or supply unreliable. Today's solar technology has evolved and solar projects are appearing in developed as well as developing countries.

The Solar LED Street Light System converts the sun's energy into electricity and stores it to provide illumination from dusk to dawn. The system includes the power generator (panel/s), storage (battery) and management (controller) as well as the LED light, pole and weather-proof housing. Luminaries utilize High Power LED's with superior thermal management design which are switched on by a timer switch built into the system.

Luminaries are supplied fully assembled & ready for either retrofit or new installations.



Solar Street Lights (LED)

Benefits:

- Easy installation no wiring required
- Proven technology. Vandal and theft-resistant components and hardware
- All parts are corrosion resistant
- Easily and quickly deployed in almost any location
- NO wiring run from and to the grid
- NO cuts through existing roads, sidewalks or landscaping
- NO maintenance costs
- NO utility bills
- Maintenance-free Batteries
- Depending on your country tax credits, grants and rebates may be available
- Better colour rendition and nighttime visibility
- No light pollution
- No Warm-Up or Cold Start Problems
- Solar panel has a lifetime of 25 years
- Two-year full system warranty
- System will have paid for itself in 4 years



Main Applications:

- Area Lighting
- Airport Lighting
- Hospital Parking
- Parks and Playground Lighting
- Parking Lot Lighting
- High Way Road Way Lighting
- Street Lighting
- Security Light
- Highway and Ramp Lighting
- Bridge Lighting
- Residential, Industrial and Commercial Lighting



System Components

Example: 40W System

No	Item	Qty	Specification
a	Solar Module 50w	2	50WP/12VDC
b	Solar Panel Support Frame (for mounting)	1	Zinc Metal
c	Deep-Cycle Maintenance-Free Battery	1	100AH/12VDC
d	Battery Box	1	IP55
e	JB920 40w/12V LED Street Light	1	10A/24VCD
f	Cable and other installation material	1 Set	
g	Charge Controller	1	

a. Solar Module: Features and Benefits

- High efficiency
- Nominal 12VDC for standard output
- Outstanding IO-light performance
- High transparent low iron , tempered glass
- Unique techniques give the panel following feature : aesthetic appearance, withstands high wind pressure and snow load and easy installation
- Technology ensure that problem of water freezing and warping do not occur
- Design to meet demand of customers
- Ce and IEC61215 Certification



Electrical Characteristics:

Open-Circuit Voltage (V _{0c}):	20.6V
Optimum Operating Voltage (V _{mp}):	17.0V
Short-Circuit Current (I _{sc}):	3.63A
Optimum Operating Current (I _{mp}):	2.94A
Maximum Power at STC (I' max):	50Wp
Operating Temperature:	-40°C to +85°C
Maximum System Voltage:	715V DC

The electrical characteristics are within $\pm 10\%$ of the indicated values of I_{sc}, V_{oc} and P_{max} under Standard Test Conditions (STC: Irradiance 1000W/m², Module Temperature 25°C, AM=1.5)



System Components

Example: 40W System continued

a. Solar Module: (continued)

Specifications:

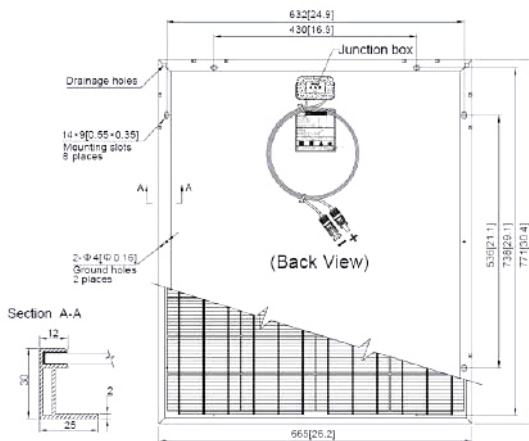
Cell: Poly-crystalline Silicon

No of Cells and Connections: 36 (4x9)

Module Dimension: 771mm x 665mm x 30mm

Weight: 6.2 kg

Module Diagram



Temperature Coefficients:

NOCT: 45°C ± 2

Short Circuit Current Temp. Coefficient: (0.055 ± 0.01)% /K

Open Circuit Voltage Temp. Coefficient: - (75 ± 10)mV /K

Peak Power Temp. Coefficient: - (0.47 ± 0.05)% /K

Power Tolerance: ±5%

Output:

Cable: LAPP (4.0mm²)

Lengths: 750mm (-) and 750mm (+)

Connection: MC Plug Type IV

b. Panel Support Frame:



The solar array support structure offers a strong zinc metal frame and has been designed to support 2 modules 50w /12v with best location tilt angle.

The orientation is set according to the site latitude in order to optimize solar array production. The structure is made of aluminum and zinc, which makes it extremely resistant to external climatic conditions yet very easy to transport. It has been designed to withstand wind speeds of up to 180km/h.

The ground mounted support structure, 4 ft, is supplied with a set of stainless steel anti-theft assembling bolts and nuts as well as mechanical anchor bolts.

It is simple and easy to assemble and only requires low level engineering skills to be mounted.



System Components

Example: 40W System continued

c) Maintenance Free Lead-Acid Battery:

Supply for electric power system and nuclear power plant, energy storage of solar and wind power generation.

- Eco friendly: sealed structure with reliable safety valve, no leakage or no acidic gas spillage
- Good internal water cycling: based on the oxygen compound principle, little gas generated and little water depletion
- Excellent discharge characteristics: low internal resistance, compact, excellent discharge performance
- Low self-discharge: manufactured using only high quality materials, good storage life
- Long life: made of special alloy, cycle life 50% longer



Main Technical Parameters
Basic Parameters

Battery type	Rated Voltage	Rated Capacity Ah (C10)	L	W	Slot Height	Total Height	Battery Weight ±2%Kg	Output Structure Size
6-FMJ-100	12	100	513mm	164mm	214mm	224mm	45kg	M8 screwed hole output

with Battery Box:





System Components

Example: 40W System continued

e) JB920 40W 12V High Power LED Street Light: (for the full range of models please read PDF 'LED Street Lights')

Model : JB920

Power: 40w
 Power Efficiency: >90%
 Voltage : AC (85V ~ 265V) DC 12V
 Luminous Efficiency: 80lm/watt
 Initial luminous Flux: 3200lm (40w)
 Frequency: 50 ~ 60Hz
 Effective Beam Angle: 65 Degrees
 Color Rendering Index : Ra > 80
 Color Temperature : 2700K ~ 7000K
 Life Span : > 50000hours
 Protection Degree: IP 65
 Certification: CE, ROHS
 Net Weight (kg) : 9.7kg



Materials:

- High-purity aluminium reflector, light housing and heat sink
- High intensity tempered glass
- High powerful LED light source
- High efficiency imported LED driver

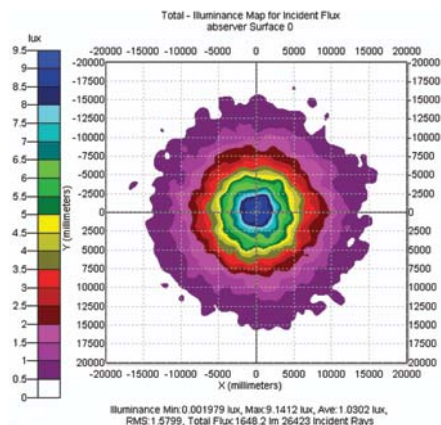
Usage:

Pavements, schools, parks, yards, inhabitancy area, factories, etc.

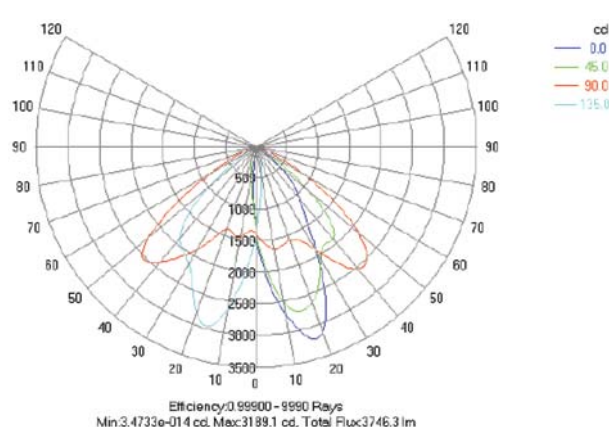
Features:

- Single/Dual high power LED
- Effective heat conductivity
- Operates in high humidity
- Instant start
- High purity aluminium reflector
- Similar to Sunlight, minimal glare
- Environmentally friendly
- UV and corrosion resistant
- Solar panel compatible
- Up to 70% lower energy consumption

JB920LD 50w LUX test results:



Polar Candellar Distribution Plot:





System Components

Example: 40W System continued

f) Cables

The function of cables is to connect all the parts of this system together.
The working temperature of the cables is $-20\sim+50^{\circ}\text{C}$.

Cables for this system include:

- PV module to Controller
- Controller to Battery
- Controller to Lamps



g) Solar Charge Controller (with micro-controller for automatic lighting control functions)



FEATURES:

- Microcontroller digital accuracy
- Fully automatic operation
- 16 field adjustable lighting control options
- Manual test capability
- Detects day and night using the PV array
- Suitable for all 12/24 Vdc lamps
- Suitable for Seal lead acid battery
- Temperature compensation

4 Models available:

- 12 Volt: 5amp and 10 amp rating
- 24 Volt: 5amp and 10 amp rating

Advantages:

- Proven reliability
- Precise lighting control
- PWM battery charging