Details and specification for 30W solar powered LED street lights.
Solar LED Lighting System
A Solar LED Lighting System is a solar Photovoltaic System designed for outdoor application especially for remote areas where conventional electricity is not available.
A typical Solar Lighting System consists of the following system components:

- Solar PV Module
- Storage Battery
- LED Light Unit
- Microprocessor based Solar Charge Controller
- GI Pole with silver paint.
- Bracket for panel mounting.
- Weather Proof Battery box
- Connecting Cable, hardware and other accessories.

Working Principle
Solar PV Module converts the Sunlight in to electricity during daytime. The electricity is stored in storage battery for use in the night to operate the light unit. The storage battery is connected to the solar PV Module through a solar charge controller to avoid overcharging and to prevent short circuit of the battery.

A light unit is connected to the battery through the solar charge controller & it automatically switches ON the light unit at dusk and switches OFF at dawn.
PV Module [125Wp]

A solar PV module of required size is used. The size of the module (Wp) is determined by the following parameters.

- Numbers of hours of operation of light per day.
- Total wattage of the light.
- Autonomy of the lights.

Manufactured by: Waree /Green Brilliance Complying IEC Standard

- High efficiency crystalline silicone Solar cells, laminated between glass and back sheet using EVA as an encapsulation for improved power tolerance.
- Low iron textured toughened glass for high transmittance, better output and safety.
- Weather proof junction box with easy interconnection arrangement.
- Designed for system voltage of up to 1000V DC.
Nominal Power $P_{\text{max}}$ (W) : 125
Max-Power Voltage $V_{\text{mp}}$ (V) : 17
Max-Power Current $I_{\text{mp}}$ (A) : 7.06
Open Circuit Voltage $V_{\text{oc}}$ (V) : 21
Short Circuit Current $I_{\text{sc}}$ (A) : 7.62

Dimensions (L x W x H) : 1490 x 675 x 35 mm
Weight: 11.75 Kg each

**Other Characteristics:**
- Type of cell: Mono/Multi Crystalline Silicon
- Front Face: Tempered Glass (Low Iron)
- Encapsulate: Ethylene Vinyl Acetate
- Frame: Anodised Aluminium
- Junction Box: Weatherproof Nylon 6
- Tem Coefficients:
  - Voltage: -0.123V/K
  - Current: +4.4mA/K
  - Power: -0.47%/K
- NOCT: 47+/−2°C

**CERTIFICATIONS:**

**Warranty:** 15 years
LED Luminary [30W]

The light unit operates during the night. High power LED with 120 lumens/watt output with life of more than 50,000 hours are used. LED lights give 90% more light output than any CFL lamps.

The light unit has the following features and technical specifications.

<table>
<thead>
<tr>
<th>1 Input Voltage</th>
<th>11 – 15 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Power Factor</td>
<td>&gt;= 0.95</td>
</tr>
<tr>
<td>4 Index of Protection Level</td>
<td>IP 65</td>
</tr>
<tr>
<td>5 Life expectancy of Product</td>
<td>Above 50,000 hrs with 70% Lumens maintenance</td>
</tr>
<tr>
<td>6 Color Temperature</td>
<td>Minimum 5700 to 6500K (Suitable for white light)</td>
</tr>
<tr>
<td>7 Color Rendering</td>
<td>&gt;70</td>
</tr>
<tr>
<td>8 Make LED</td>
<td>High power LED: CREE or Nichia.</td>
</tr>
<tr>
<td>LED viewing angle</td>
<td>120 degree</td>
</tr>
<tr>
<td>9 LED Housing(body)</td>
<td>High quality housing such as Pressure Die cast aluminum with smooth finish power coated.</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10 Efficiency</td>
<td>Efficiency of driver is $\geq 85%$</td>
</tr>
<tr>
<td>13 Operating Temp.</td>
<td>-5 to 60 Deg C. Ambient</td>
</tr>
<tr>
<td>Humidity.</td>
<td>90%</td>
</tr>
<tr>
<td>14 Efficiency of bare LED</td>
<td>$\geq 120$ lumens / Watt.</td>
</tr>
<tr>
<td>15 LED Operating Current (Driver output current)</td>
<td>350ma to 700ma(as per manufacturers specification)</td>
</tr>
<tr>
<td>16 Output Luminous Flux of fixture</td>
<td>$&gt;75%$</td>
</tr>
<tr>
<td>19 Isolation</td>
<td>1.7KV AC between Input and Output for 1.5Mins.</td>
</tr>
<tr>
<td>20 Over Voltage Protection (max)</td>
<td>Feedback Loop</td>
</tr>
<tr>
<td>21 Certification</td>
<td>ISO 9001:2008</td>
</tr>
<tr>
<td>22 Environmental compliance</td>
<td>RoHS</td>
</tr>
</tbody>
</table>
| 22 Test certificate required for | Resistance to humidity test  
Environmental test  
Insulation resistance test  
Reverse polarity test |
| 23 LM 80 CERTIFICATION | Tested                                                                                   |
| 24 LM 79 CERTIFICATION | Tested                                                                                   |
| 25 ERDA OR NABL CERTIFICATION | Tested                                                                                   |
Tubular Battery [120 Ah/ 12V]

Battery is used for storing electricity generated by the solar PV module for use in the night. Preferably SMF or tubular batteries are used.

Technical details:

- C20 capacity: 120Ah
- Nominal Voltage: 12V
- Battery weight: 28Kg
- Dimensions (l x w x h): 518x275x250 mm

Features:

- Batteries are designed to withstand frequent and long power cuts.
- Assembled in polypropylene containers with plate holding cradles.
- Extra thick tubular plates as per Hi-Power design.
- Thick tubular plates are of low antimony alloy and cast in HADO/SUVEMA machines at above 100 bas pressure for super fine grain structure and minimized grid corrosion at high temperature.
- Negative plates are of low antimony alloy with lattice structures.
- Micro porous ceramic vent cum sealed float plugs to reduce topping up frequency.
- Resistance to corrosion and high ambient temperature.
- Abuse resistant.
- Low self discharge.
- Deep cycle design.
Microprocessor based Solar Charge Controller [10A]
Solar charge Controller is used for protecting the battery from over charging and deep discharging. As the Solar Charge Controller is programmable the Dusk to Dawn and time Control can be adjusted for automatic operation of the light. In addition to this the solar charge controller has a advantage for setting the light for peak hours and non peak hours. The solar charge controller has the required temperature sensor for preventing the battery from overheating due to load.

Electrical Parameters:

- **Rated charge current**: 10Amps
- **Maximum Load current**: 12 Amps
- **Nominal Battery voltage**: 12V
- **Battery Floating Voltage**: 13.6 V
- **Battery Voltage Range**: 10.5V - 14.5V
- **Battery Low Voltage Cut-Off**: 10.8V(Re connect 12.5)
- **Battery over Voltage Cut-off**: 14.5V
• Maximum PV open circuit Voltage: 20V
• Maximum PV Panel Input: 150Wp
• Self Consumption (Loss of Empty Load): < 20mA

General:

• Efficiency: > 90% at full load
• Humidity: 95% non-condensing
• Size (L X B X H): 110x76x40 mm
• Construction: Open Frame
• Terminations: Connectors
• Operating Temperature: 0 to 50 °C
• Storage Temperature: 0 to 70 °C

Protections:
Reverse current protection from battery to PV is available.

Indications:

• Load Cut-off: Red Battery
• Fully Charged: Yellow
• Battery Charging: Green
• PV voltage: White

Cautions:

• No short circuit protections for output load, PV input & battery terminations are available.
• No PV input polarity & output overload protection.
• No in-built reverse polarity protection for load hence LED driver should have reverse polarity protection.
• Rated Battery & Rated PV Panel should be used.
Battery Box

Battery box is used to house the battery securely. Metallic powder coated & vented boxes are used.

Features:
- IP 65 grade metal box.
- Weather proof powder coated.
- Theft proof locking system.
- Ventilated body.
Pole [7m]

- Galvanized Iron (GI) pole.
- B-class.
- 150mm diameter.
- Primer with silver coating is done after fabrication.
- Pole height 7 m.
- Built in Battery mounting stand.
- T-section and brackets for Solar panel mounting.

Pole Dia: 150mm

Pole Specs:
G. I. - B class
Paint Silver
Accessories:

- 2 core cable from luminay to battery.
- 2 core cable from Panel to battery.
- 10sq mm wire for battery connections.
- Big U clamps for battery box mounting.
- Small U clamps for Solar panel mounting.
- Assorted nuts and bolts for panel fixing.
- Lugs for wires.