

ATHENS

Solar LED Street Light 100W/80W

Outdoor solar lighting system uses solar cells which convert sunlight into electricity. Electricity is stored in the battery for use at night. Athens Solar LED Street Light features all in one design function, low profile design with PIR/microwave motion sensor and smartcontroller all built in with bifacial solar panel. Athens Solar Lights are easy to install and virtually maintenance free.



NOMINAL FLUX..... 18000 LUMENS or 14400 LUMENS
NOMINAL POWER..... 100 WATT or 80 WATT

LIGHTING

Efficiency..... 180 Lumens/Watt
Chips LED..... PHILIPS L3=LUMILED 5050
LED Lifetime..... Over 80000 hours LM80
Optics/CCT..... 5000K
Light Height choose from..... 32' - 36' or 39'-42' Feet

BATTERY

Technology..... Lithium Iron Phosphate LIFEPO4
Capacity..... 922Wh or 768Wh
Autonomy..... Over 12 hours at full charge - 2-3 Rainy Days back up
Charging Time..... 6 hours
Lifespan..... L90B10 - 100000 hrs, @Tq 25°C
Operating Temperature..... -40 °F to 122 °F
Storage Temperature..... -4°F to 113°F
Charing Temperature..... 32°F to 113°F

ENERGY

Solar Panel..... 160W/36V or 130W/36V
Cells Type..... Monocrystalline Panel Grade A 25 years
Certificates..... IEC 61215 - IEC 61730 I and II - IEC 60904

ELECTRONIC

Sensor..... Without Sensor

DIMENSIONS

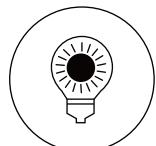
Product..... 71.33" x 20.55" x 8.85" or 60.31" x 20.55" x 8.85"
Carton Size..... 82.24" x 23.62 x 7.67" or 70.43" x 23.62" x 7.67"
Net Weight..... 81.57LBS or 68.34LBS
Gross Weight..... 85.98LBS or 72.75LBS
Materials..... Heavy-duty die-cast aluminum (EN AC-46100)
Installation..... Concrete base or insert on support
Product Model..... AVS-BF02-100W or AVS-BF02-80W

Beyond Solar retains the right to modify or change product specifications without prior notice, as part of our ongoing commitment to improvement

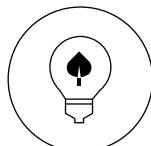
Model #	SKU #	Fixture Height	Power	PV Type	Solar Panel	Lithium Battery	Lumens	CCT	IP Rating	Material
AVS-BF02-100W	786331	39-42FT	100W	MONO	160Wp	922WH 25.6V 36AH	18000LM	5000K	IP65	ALUMINUM
AVS-BF02-80W	786441	32-36FT	80W	MONO	130Wp	786WH 25.6V 30AH	14400LM	5000K	IP65	ALUMINUM



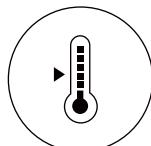
LUMEN EFFICIENCY >180LM/W ACHIEVE HIGHER ILLUMINATION



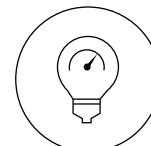
High Efficiency



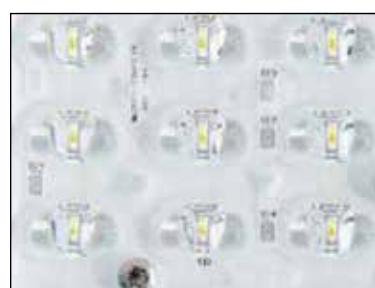
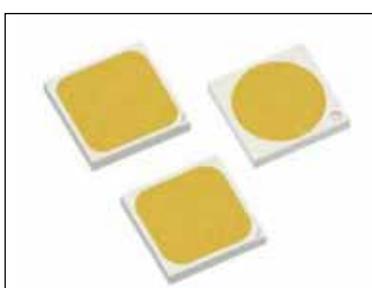
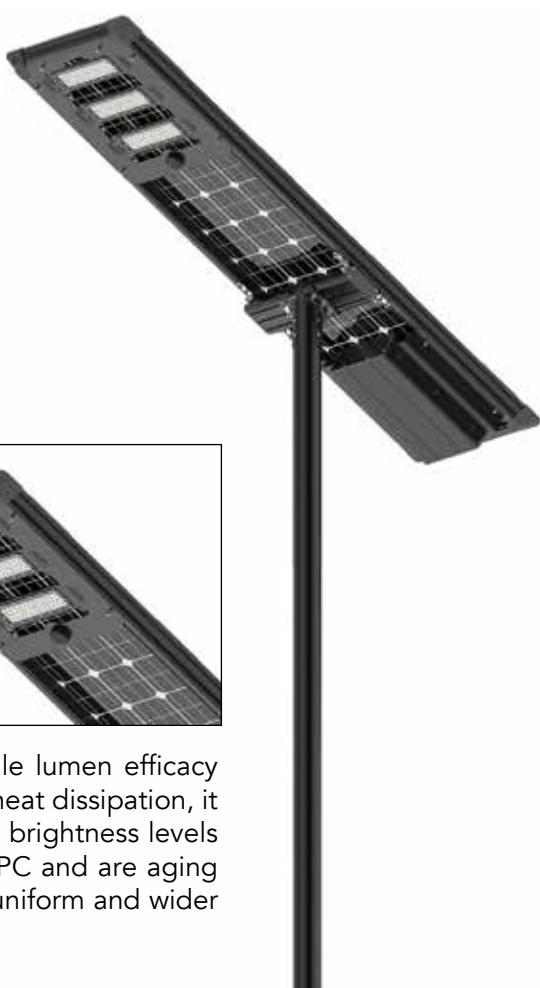
Long Lifespan



Less Calorific Value



Low Light Decay



Seoul 5050 LED chip creates a first-class light source. By choosing it, single lumen efficacy >180lm/W, with the aluminum lamp base and sealed lens, with its excellent heat dissipation, it is as if the LED chip has been placed in a sealed unit. Thus it maintains high brightness levels with very little fading. The sealed lenses are made of strong UV-protected PC and are aging and shock-resistant; The well-optimized light distribution makes for a more uniform and wider lighting area.

DISTRIBUTION

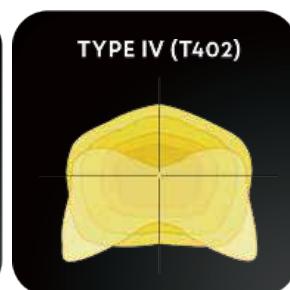
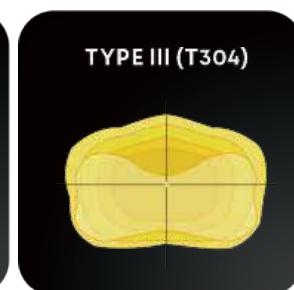
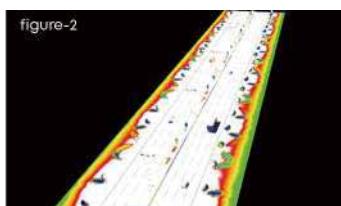
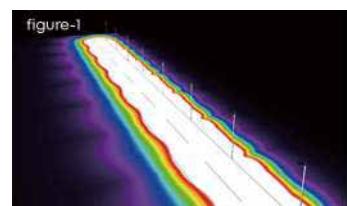


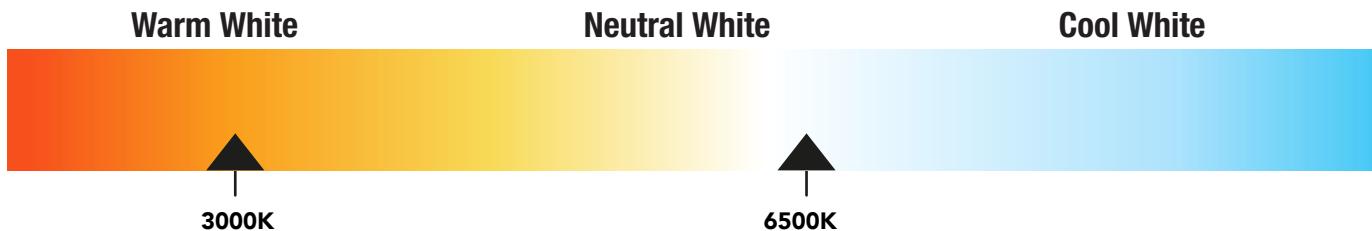
Figure-1: Example of rural branch road

Figure-2: Example of main road or avenue



Planning and analysis of street lights can be done by using lighting simulation & design software, which allows the lighting effect a more intuitive display. It uses rendering, the process of generating an image from a model, by means of computer programs resulting in different tools for measuring the simulated light levels.

CORRELATED COLOR TEMPERATURE



Bifacial SOLAR PANEL

160 WATT OR 130 WATT

Solar cells **GRADE A**



COST-EFFECTIVENESS

Cost is one of the biggest factors a big factor – particularly in the case of monofacial modules. The cost of bifacial modules has fallen precipitously over the last two decades. Notably, as costs have decreased, so too has the cost gap between mono- and bifacial modules.

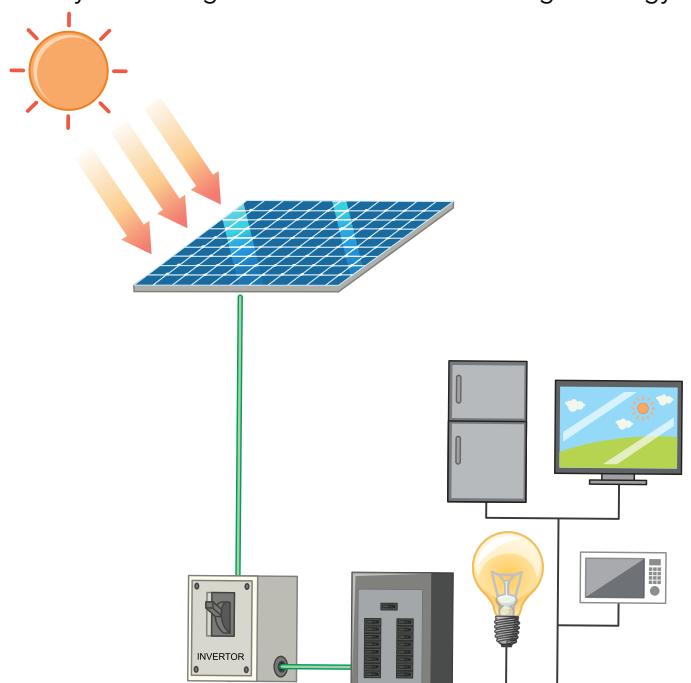
HIGH CONVERSION EFFICIENCY

There is no doubt bifacial modules will increase power production. Results and studies have shown that bifacial modules can produce additional power between 10-20% over monofacial panels. If conditions are optimized and single-axis trackers adopted, the additional power can be as high as 30-40%.

OTHER BENEFITS

• Site Selection:

The site selection of the bifacial panels can be optimized. For places where land is less electricity supply and expensive, monofacial panels should be laid in the right direction to ensure maximum energy collection. However, bifacial modules can have optimal spacing and therefore higher yields. Also, bifacial yields are greater where the diffuse light energy is greater, which means at higher latitudes the bifacial yield will be greater than at lower latitudes.



• High Albedo:

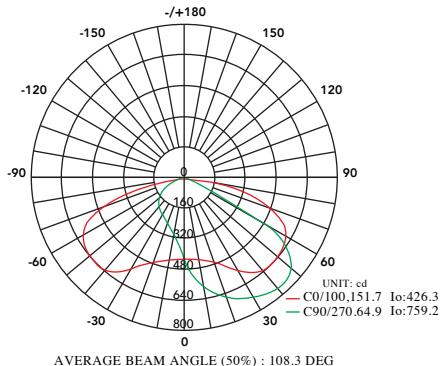
The environment has a high albedo that is great for bifacial panels compared with monofacial panels. Desert sand is even a better option. The best option is white concrete or highly reflective roof foil. Snow and ice also have a very high albedo.

• Tilt:

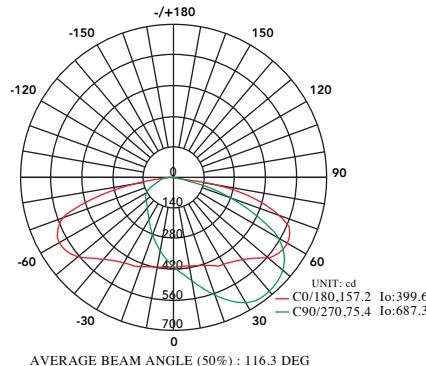
More flexible than monofacial panel. Bifacial panels can receive light even at sunset. This will vary from site to site, but generally, 2~15 degrees more than the monofacial tilt has been shown to be effective.

PHOTOMETRY

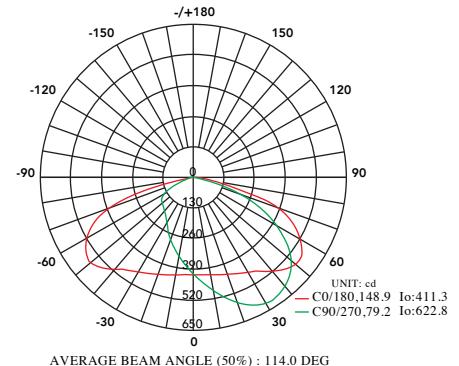
Type II



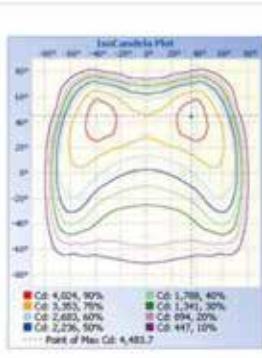
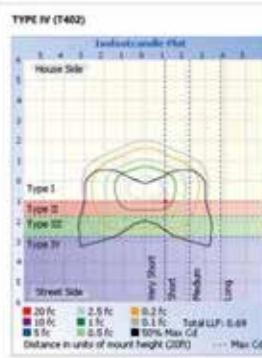
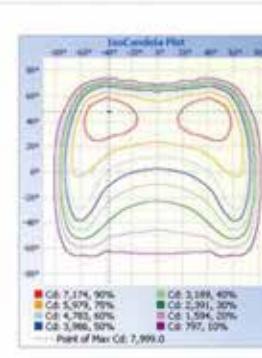
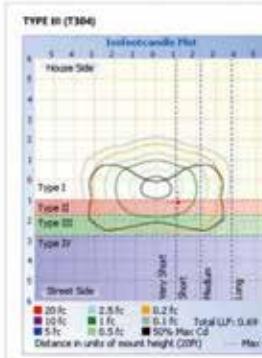
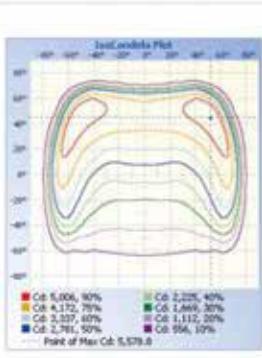
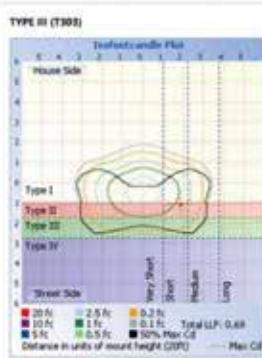
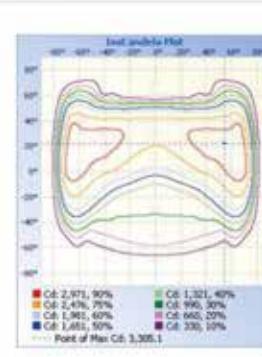
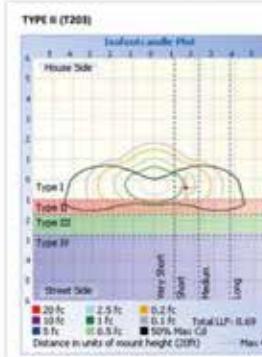
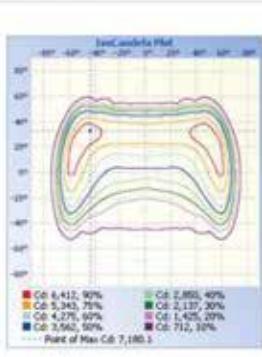
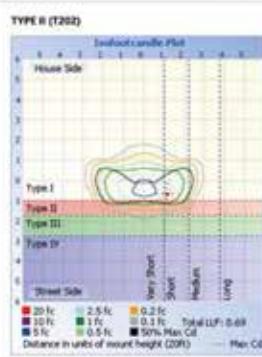
Type III



Type IV



ILLUMINANCE DIAGRAM



Smart City Starts With Smart Lighting

AUTONOMY CONTROL REFERENCE

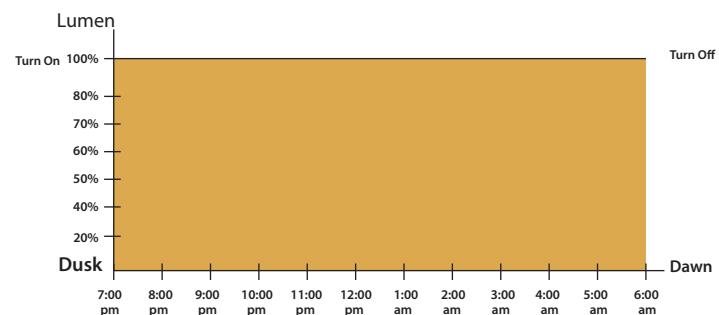
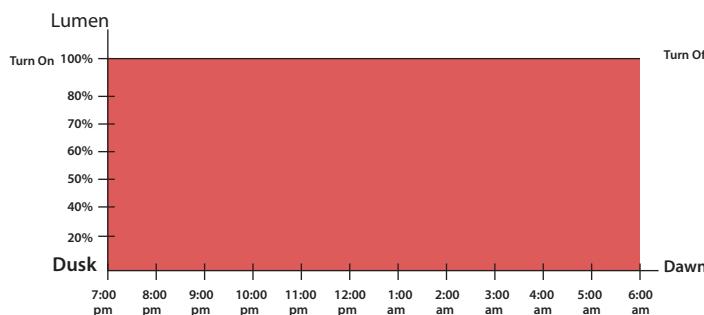
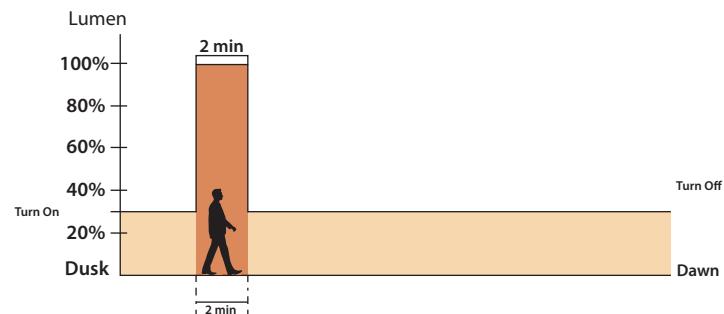
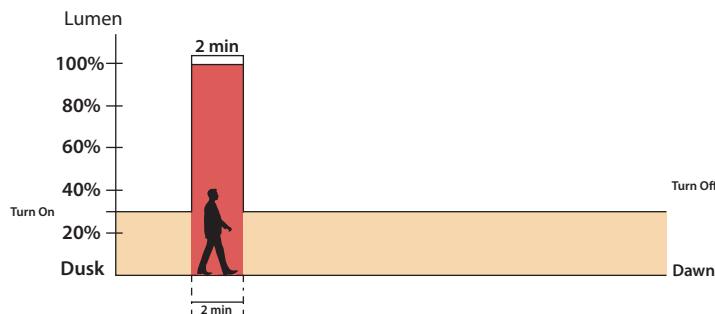
30%~100% MOTION SENSOR MODE

Constant 30% brightness (turns on at dusk, turns off at dawn); 100% brightness turns on for 2 minutes when motion is

20%~80% MOTION SENSOR MODE

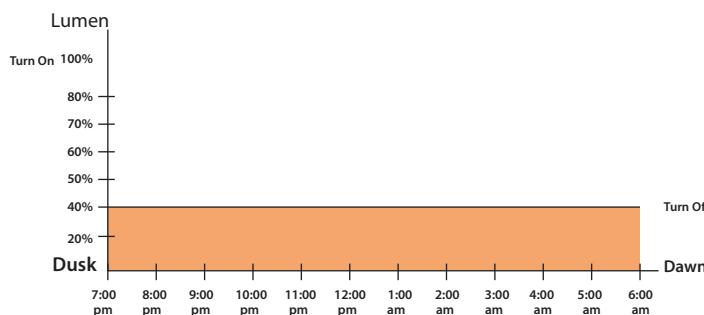
Constant 20% brightness (turns on at dusk, turns off at dawn);

80% brightness turns on for 2 minutes when motion is



40% CONSTANT MODE

40% Brightness From Dusk To Dawn.



Application Of Typical Networking

Of Smart Street Light (Optional)

STRATEGY CONTROL

By installing the node of the street light controller on the ambient light sensor, electric energy metering unit to collect to the street light power (voltage, current, power), and the ambient light conditions, according to the administrator deployment strategy to mobilize installed on the street light controller of the automatic control system to control the street light switch, adjust brightness, color temperature adjustment, etc.

GATEWAY CONTROL

The Lora Light wireless system with strong anti-interference ability is adopted in the wireless transmission unit of the street light controller to realize the communication between nodes and gateways. The data of various sensors on the node street lamp controller is sent back to the gateway, and the control command of the gateway is also sent to the node street light controller

CLOUD PLATFORM

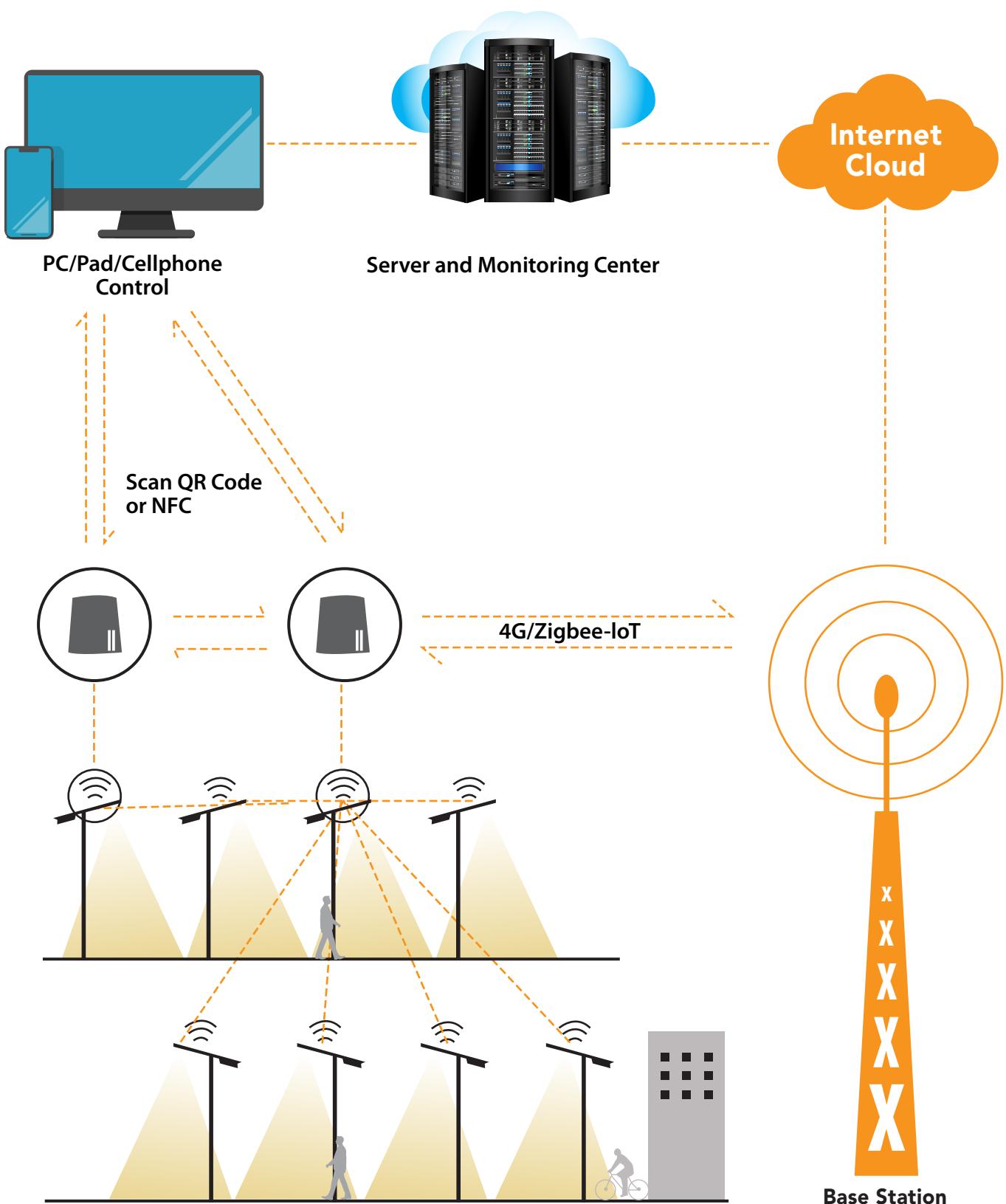
The gateway controller transmits the street light control information of all nodes under the gateway to the cloud platform through 4G/Zigbee-IoT (optional) wireless mode, and at the same time sends the instructions of the cloud platform to the street light controller of each node

CONTROLLER IOT-4G/ZIGBEE

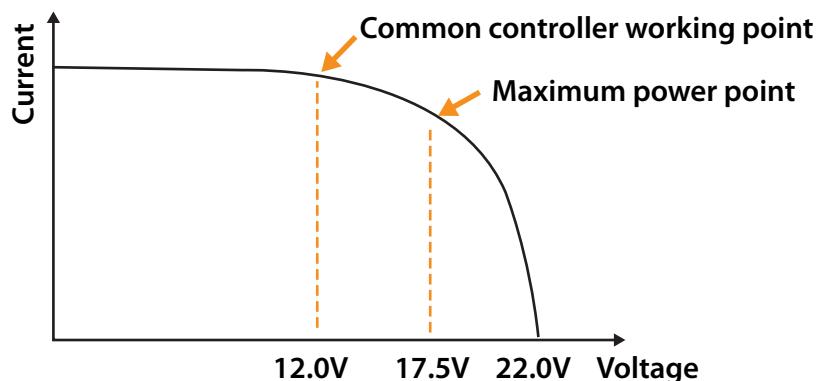


- Built-in IoT module (4G/Zigbee)
- Adopt Moving Track MPPT maximum power tracking technology, with higher tracking efficiency and faster speed;
- Lead-acid battery and lithium battery are universal. Operating parameters can be set by remote controller;
- Ultra green power control technology with extremely low static power consumption and dormant current;
- Lead acid battery multi-stage temperature compensated constant voltage charging;
- 10 Programmable load power/time control setting;
- Battery charging and discharging high and low temperature protection function, working temperature can be set;
- A variety of intelligent modes can be selected, automatically adjust the load power according to the battery power;
- High precision digital booster constant-current control algorithm, high efficiency and high constant-current precision;
- 2.4G wireless communication, can set read parameters, read status, etc;
- Battery/PV reverse connection protection, LED short circuit/open circuit/limited power protection and other multiple protection functions.

Application Of Typical IoT Networking



ADVANTAGES OF CONTROLLER



1) Moving Track MPPT maximum power tracking technology is adopted to improve the tracking efficiency and speed by more than 20%.

2) UltraGreen power control technology with extremely low static power consumption and sleep current.

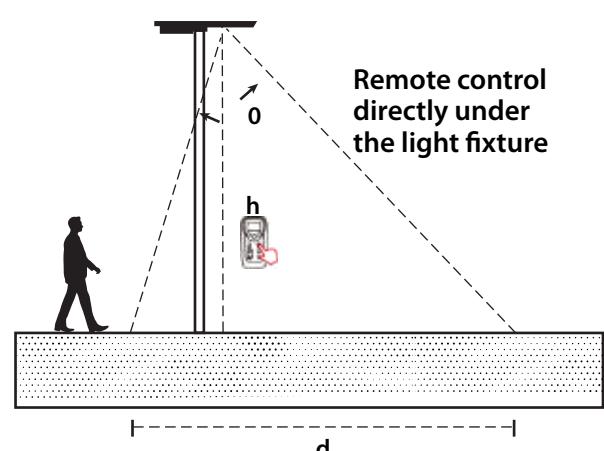
3) 10 time-periods programmable load power/time control.

4) Multiple intelligent power modes can be selected, and the load power can be automatically adjusted according to the battery power.

5) Multiple protection functions such as battery /PV reverse connection protection, LED short circuit/open circuit/power limit protection.

6) Aluminum metal housing, IP67 waterproof rating, can be used in a variety of harsh environments.

7) Extensible IoT remote communication monitoring function.



DETECTION DISTANCE

Remote control distance 5-8 meters, installation height and environment and other factors will affect the controller sensitivity, please refer to the actual field.

Note: Please do not place 2 or more lights within 12 meters at the same time while using the remote controller, receiving or sending may fail.

Inductive Type (alternative)	0-Angle (X-axis rotation: 360°)	h (Height of lamp rod)	d (Inductive width)
IR (Infrared)	60°	6-8m	6-10m
WB (Microwave)	65°	6-10m	7-10m

Remote not included with purchase; provided only upon request for custom settings.



EASY INSTALLATION

BEFORE INSTALLATION

This procedure is designed as an installation aid. Skilled tradespeople that are familiar with general construction and electrical installation techniques should perform the installation. Licensed electricians should provide electrical installation connections. Installations and connections should be done in accordance with all national and local codes and permits. In no way is this document intended to construe warranty or fitness of use of the products described, nor is it intended to provide safety instruction for those installing the product.

TEST BEFORE INSTALLATION

1. Open the package and check that there's no damage on the package and that the accessories are complete.
2. Open the power switch to test the charge and discharge function.
3. Advised to read the FAQ and Common Fault Analysis carefully before installation.

INSTALLATION TOOLS REFERENCE - PACKING LIST:

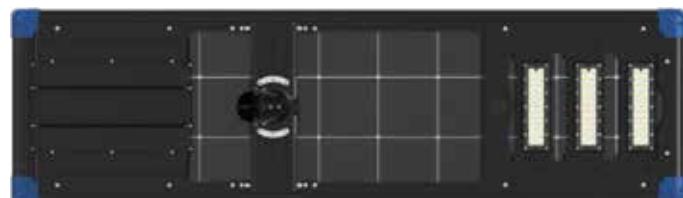


10mm
Outer hex wrench



13mm
Outer hex wrench

Note: Installation tool is not included with product.



Lamp body 1PCS



Mounting bracket
1PCS



Outer hexagon screws
M8*30mm 8PCS



Bracket press block
2PCS



Outer hexagon screws
M6*16mm 6PCS



Flat washer
M6/6PCS



Spring washer
M6/6PCS

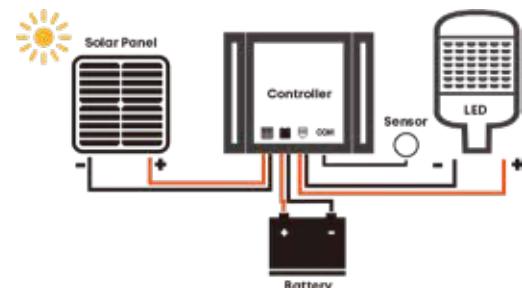


Nut cap
M6/6PCS

READ BEFORE INSTALLATION

WORKING WAY

The solar panel receives solar radiation energy and converts it into electricity, which is stored in the battery by the photovoltaic controller. At night, when the illumination gradually decreases to about 10LUX and the solar panel voltage is 5V, the charge and discharge controller detects this voltage value, and controls the battery to discharge for the LEDs to complete the process of daytime charging and evening discharge.



DEFAULT LIGHTING MODE

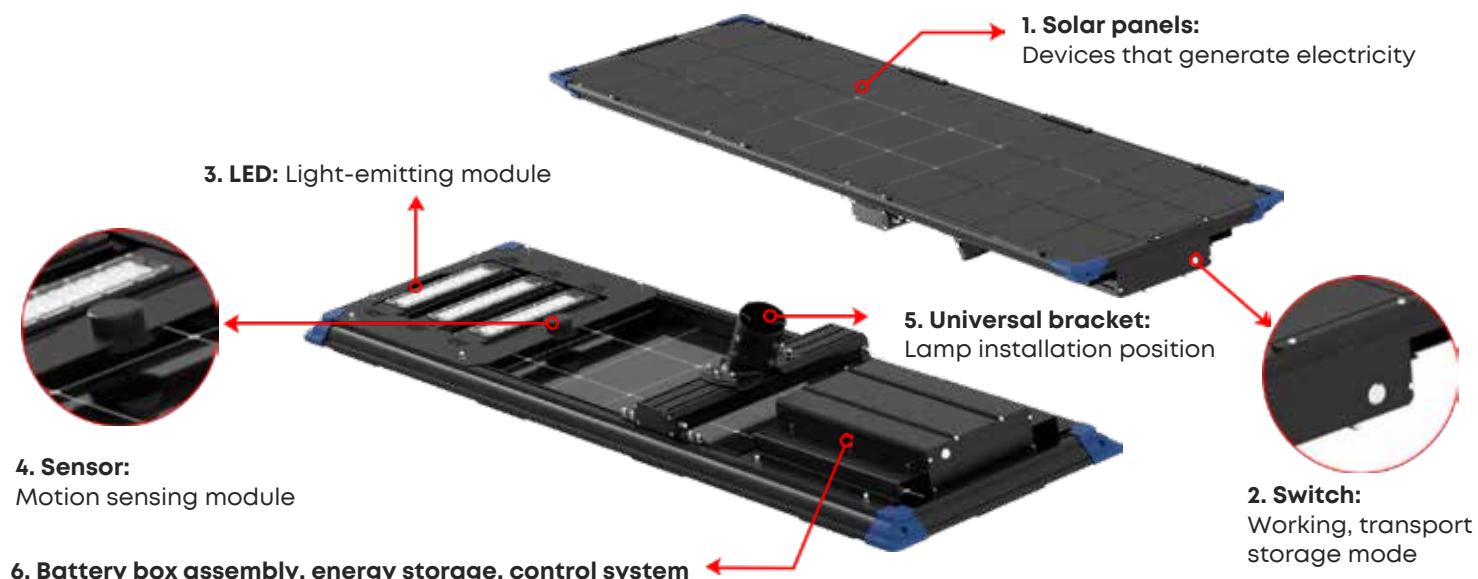
- 1) 4H-Detected 100%, None 30%.
- 3H-Detected 70%, None 30%
- 3H-Detected 50%, None 20%.
- 4H-Detected 30%, None 10%.
- 2) Subject to specific order requirements

Lighting Mode (Optional)

_____ -Detected _____ %, None _____ %



FUNCTION DESCRIPTION



READ BEFORE INSTALLATION

FAQ

1. How to activate the solar LED light?

After opening the package, turn on the power switch of the light (the button is in the state of power on when recessed), the fixture will be lighted up; If it is not, place the fixture under the sunlight for about 10 minutes, and then completely covered with the solar panel, the fixture will be lighted up.

2. How to test the charging and discharging function of solar LED light?

After turning on the power switch, completely cover the solar panel of the fixture or place it in a dark environment (no reflection), the light will be lighted up; Then place the fixture under the sunlight and the light will be turned off.

3. The fixture can not be lighted up since it is placed for a long time?

As the battery will consume power, the system will lose power completely. Leaving the battery for a long time may cause irreversible damage, so you need to charge it every three months if it is not in the use.

4. Shorter light time?

The shorter light time is due to low battery power, or low charging efficiencies, such as rainy days, solar panels covered by trees, and dust; Lithium-ion battery losses will also lead to less energy storage.

5. Before installation, if you find that the battery of the solar light is out of power and choose to use the charger to charge the battery, please consult customer service for the specifications and user manual. Please note that the use of mismatched charging may damage the light.

6. Charger and remote control are not standard accessories, please consult and order separately.

COMMON FAULT ANALYSIS

Fault phenomenon of luminaire

No Light, No Indicator

Failure Analysis

1. The switch may not conduct.

2. The connection terminals may be in poor contact, loose, or fall off.

3. Out of battery.

Troubleshooting Methods

1. Whether the switch button is normal, if the switch is pressed, there will be a sound.

2. If the switch button is damaged, you can open the 2 wires of the switch, and use a multimeter to test the continuity of the switch in different states., If it is a switch problem, you can cut it and replace it with a new one, or you can cut it off, connect the two wires in parallel, and wrap them with insulating tape (the switch function could not be used).

Visually inspect for loose wires, Use a multimeter to test whether the two terminals of the terminal are connected. If it is connected, it is normal; if it is not connected, it may be due to poor wiring or the terminal is not connected, and the terminal can be replaced.

Make sure that other components are normal, use a multimeter to test whether there is voltage across the battery, if there is voltage, the battery is normal ; If there is no voltage, it needs to be activated by charging (the luminaire should be exposed to the sun for more than 0.5 hours).

Fault phenomenon of luminaire

No Light, No Indicator

The light is off, the red indicator flashes quickly

Failure Analysis

4. The solar panel may be damaged and cannot be activated when out of battery.
5. The controller may be damaged.
1. The load may be shorted or open.
2. The battery or solar panel may be badly wired.
3. The battery may be overcharged and overdischarged or protected by the battery protection board.
4. Overtemperature protection possible.
5. solar panel damaged possible.
6. controller damaged possible.

Troubleshooting Methods

Make sure that other components are under normal conditions. in sunlight, use a multimeter to test the short-circuit current and open-circuit voltage of the solar panel. If there is no voltage or there is voltage and no current, it means that the solar panel is damaged.

Make sure that other parts are in normal condition, it can be determined that the controller is damaged and needs to be replaced with a new controller.

Visually inspect or use a multimeter to test whether there is a short circuit or an open circuit between the positive and negative terminals of the load. Or use the remote control to read the luminaire status to confirm the problem.

Visually inspect for loose wires. Use a multimeter to test whether the two terminals of the terminal are connected. If it is connected, it is normal; if it is not connected, it may be due to badly wiring or the terminal is not connected, and the terminal can be replaced.

Use a multimeter to test whether there is voltage at both ends of the battery, if there is a voltage, it means it is normal. If there is no voltage, it needs to be charged to activate, and it needs to be charged once after a maximum of 3 months of storage. If it cannot be activated, it is judged that the battery is faulty and needs to be replaced with a new battery.

First, confirm whether the appearance of the temperature sensor of the controller is damaged. If it is damaged, you need to replace the controller. If the appearance is normal, confirm whether the actual battery compartment temperature exceeds 65°C. If it exceeds 65°C, it is normal protection, and it will recover after the temperature is normal. When the temperature is lower than 65°C, use the remote control to read the parameters to confirm whether the temperature protection value is set correctly to 65°C. If the setting is wrong, you can modify the parameters and send them to the controller.

In sunlight, use a multimeter to test the short-circuit current and open-circuit voltage of the solar panel. If there is no voltage or there is voltage and no current, it means that the solar panel is damaged.

Make sure that the above components are in normal condition, it can be determined that the controller is broken and needs to be replaced with a new one.

Fault phenomenon of luminaire

The battery life is significantly shorter

Failure Analysis

1. The azimuth or inclination of the solar panel may be incorrect, lead to a decrease in charge.
2. The solar panel may be shaded, lead to a decrease in charge.
3. There may be dust accumulation on the solar panel, which reduces the charging capacity.
4. The frequency of induction may be high, causing high power consumption.
5. It is possible that the battery capacity has deteriorated significantly.
6. The solar panel may be damaged and cannot be charged.

Insensitive induction, misoperation

1. May be affected by the installation environment.
2. It may be that the sensor is not energized or damaged.

Troubleshooting Methods

Observe whether the solar panel installation method of the luminaire is correct. Install the solar panel in the northern hemisphere to face south, and the tilt angle is recommended to be equal to the local latitude +5~20°.

Observe whether the solar panel of the luminaire receives direct sunlight during the day, remove the shade, or keep the luminaire away from the shade.

It is recommended to clean it every 6 months. The specific frequency depends on the dust accumulation. It can be cleaned with neutral tap water.

It can increase the luminaire configuration or use the remote control to set parameters to reduce the energy consumption of the luminaire, such as reducing power and shortening the discharge time.

Professional lithium battery capacity testing equipment can be used to test the actual capacity of the battery. If the battery capacity is lower than 80% during the warranty period, it indicates that the battery has decayed in advance and needs to be replaced with a new battery.

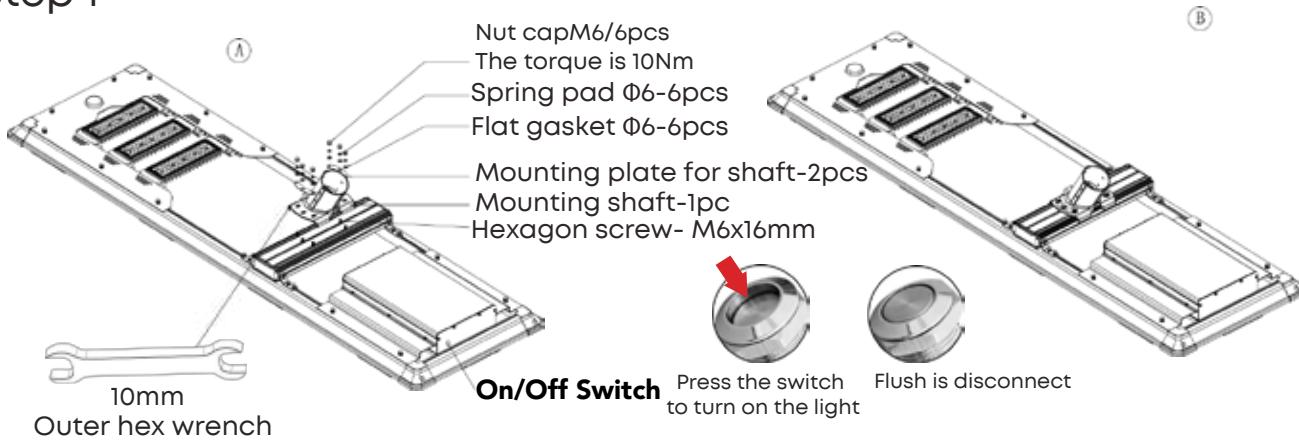
In sunlight, use a multimeter to test the short-circuit current and open-circuit voltage of the solar panel. If there is no voltage or there is voltage and no current, it means the solar panel is damaged.

Check whether there is interference from base stations, metal meshes, etc. near the installation of lamps, resulting in insensitivity of induction. Whether there are moving objects near the light pole, such as buildings, trees, water flow, etc., affecting the malfunction, whether the installation is too high, etc.

Observe whether there is a red indicator light on the sensor. If there is an indicator light, it means power is on. If there is no indicator light, you need to confirm that the sensor wiring is normal. You can open the battery compartment and reconnect the sensor connector. If there is still no indicator light, it means the sensor is connected. Abnormal, need to replace the new sensor.

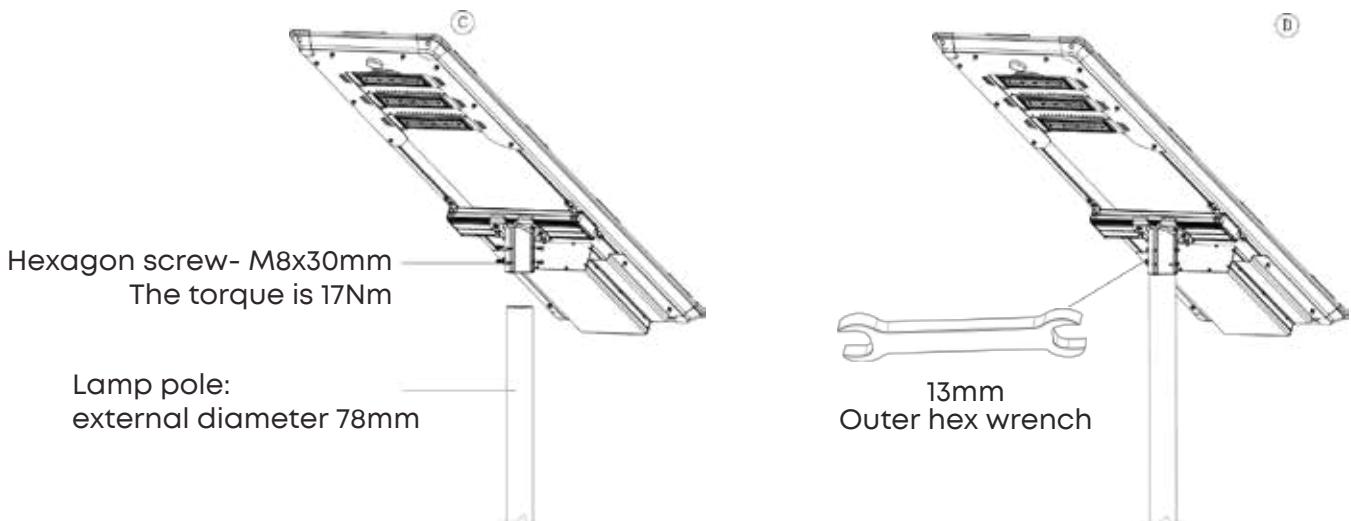
INSTALLATION PROCEDURE

Step 1



Install the screw on the profile (fixed in the middle) in alignment with the 78 holes of the mounting shaft, then use the corresponding screw on the mounting plate for shaft, and finally use the flat gasket and spring pad to install (as shown in Figure B)

Step 2



Set the fixture on the pole, adjust the angle of the fixture, fix the fixture with the hexagon screw M8x30mm.

*Note: This product is suitable for straight pole with diameter of 60-78mm and installation depth of 85mm.

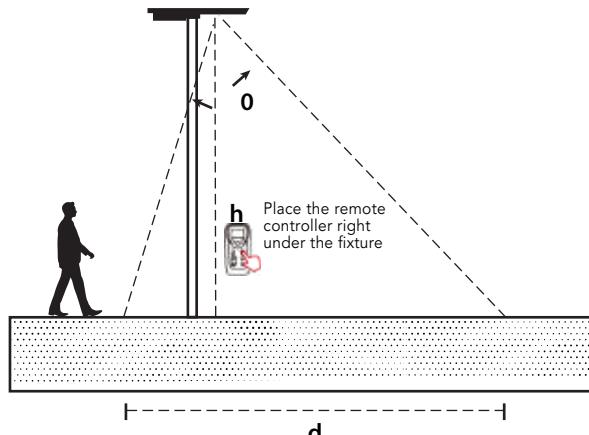


Caution:

1. Turn the power off during installation. Do not connect or disconnect under load.
2. Caution risk of fire.
3. Please do not put this product into municipal waste, check the local regulations to deal with the electronic products.

SUPPLEMENTARY FUNCTION DESCRIPTION

DETECTION DISTANCE



*Remote control is optional

Inductive Type (alternative)	0-Angle (X-axis rotation: 360°)	h (Height of lamp rod)	d (Inductive width)
IR (Infrared)	60°	6-8m	6-10m
WB (Microwave)	65°	6-10m	7-10m

Remote control distance 5-8 meters, installation height and environment and other factors will affect the controller sensitivity, please refer to the actual field.

Note: Please do not place 2 or more lights within 12 meters at the same time while using the remote controller, receiving or sending may fail.

INDICATOR STATUS

Indicator Light	State of Indicator Light	Description of Indicator Light	State of Remote Controller System
RED	Normally On	Normal System	Idle / discharge
	Slow Flash	Charging	Charge
	Fast Flash	System Failure	Short circuit / open circuit / over-discharge / PV over-temperature / BV over-temperature / EBMS / over-temperature

REMOTE CONTROL READ STATE ANALYSIS

Remote Control Reading State	Introduce	Troubleshooting Methods
OV-D	The battery is over discharged and the voltage is low	It will recover automatically after the battery is fully charged. If the battery cannot be restored or charged, use a multimeter to test whether there is voltage at both ends of the battery. If there is no voltage, the battery is faulty. Replace the battery with a new one
OV-BV	Battery Volts High	Check whether the battery voltage is correct
L-SHT	Load short circuit	Use a multimeter to check whether the load is properly connected
OV-T	The battery temperature is too high.	Ventilate and cool the battery. The battery automatically recovers when the temperature drops. Such as temperature decreasing or display failure, first confirm the controller temperature sensor appearance whether have damage, if damaged need to replace the controller, if the normal appearance, the use of the remote control to read parameters, confirmation is properly aligned, 65 degrees Celsius temperature protection value, if set error, can be sent to the controller after the modification of the parameter
L-OPN	Didn't pick up the load	Check whether the load is properly connected or the positive and negative terminals are inversely connected.

REMOTE CONTROL READ STATE ANALYSIS

OV-C	The charging current of the battery is too large, and the PV charging power is limited	If the panel power exceeds the rated power, no handling is required.
OV-PV	The voltage of the PV panel is too high	Check whether the panel voltage exceeds the maximum voltage
P-REV	The positive and negative poles of the photovoltaic board are connected in reverse	Use a multimeter to check whether the positive and negative electrodes of the photovoltaic board are correctly connected
E-BMS	Lithium battery protection board overcharge protection	After the voltage drops, the lithium battery will automatically resume charging

Matters Need Attention

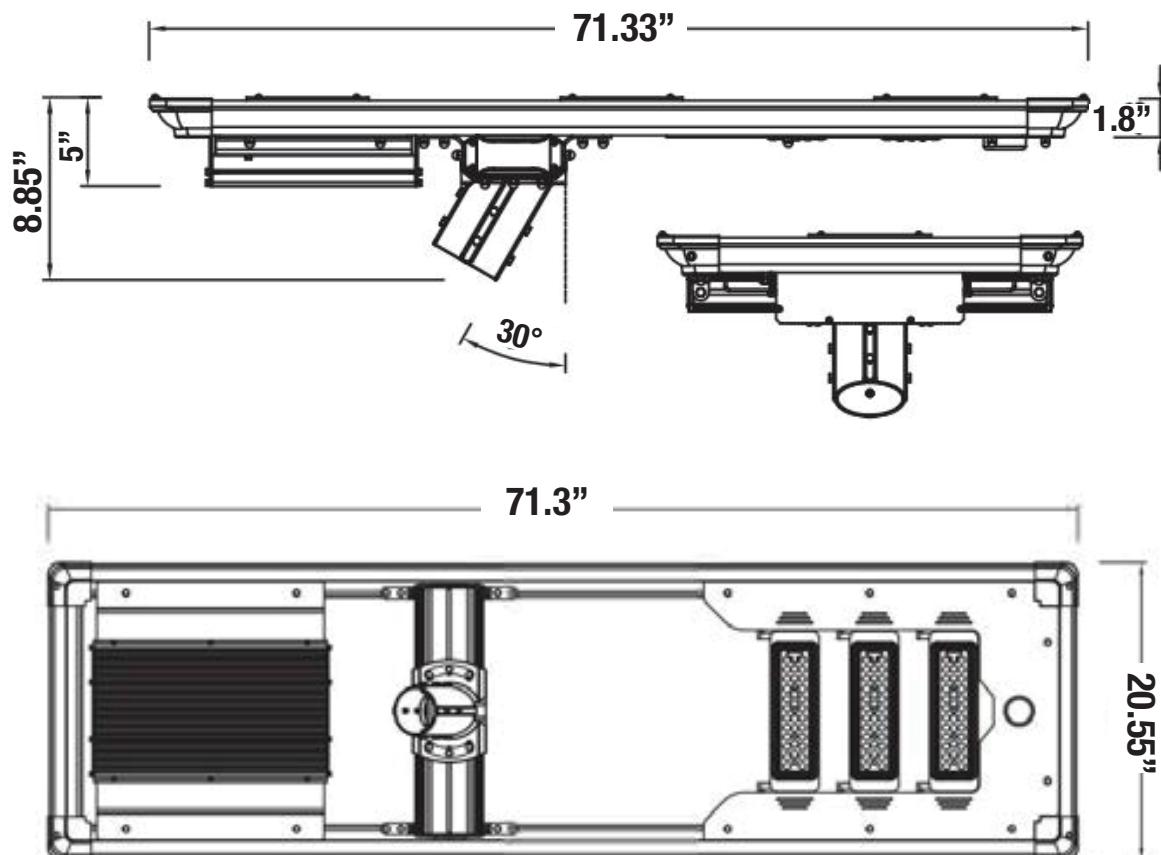
WARNING

1. Solar panels are fragile, so please do not scratch or bump when installed. Scratches, dirt and shelter on the surface will affect the power generation efficiency of solar panels.
2. Solar lamp installation, such as in the northern hemisphere solar panel should face in the northern hemisphere, such as the southern hemisphere should face south.
3. The product must be charged every 3 months when idle; If it needs to be transported or stored for a long time, it is necessary to timely check, charge and record; otherwise, the battery will be damaged. Charging method: In sunny conditions, open the lamp switch, the solar panel is placed facing the sun, continuous charging for 1-2 days. Note: Use the remote control to read the status, display charging or charging, the battery voltage is more than 13V; or use a multimeter to test the voltage at both ends of the battery is more than 13V.
4. Installation location shall be away from WIFI, omnidirectional antennas for mobile communications, small base stations for telecommunications, TV antennas, etc. Signal source too close may disable, the dimming functions.
5. The luminaire should not be installed on vibrating surfaces, otherwise the sensor is easy to be triggered by mistake.
6. The luminaire shaking may cause the sensor to be triggered by mistake.
7. The dimming function of luminaire might be effected by the objects with vibration in its sensing area. The lamp should not be installed on the surface of vibration, and the lamp should not be covered (e.g. trees or leaves), otherwise the sensor may be triggered or not triggered by mistake.
8. The product has good penetration effect on plastic and wood. Avoid metal shielding around the antenna, which will reflect and block microwave and affect the actual induction effect.

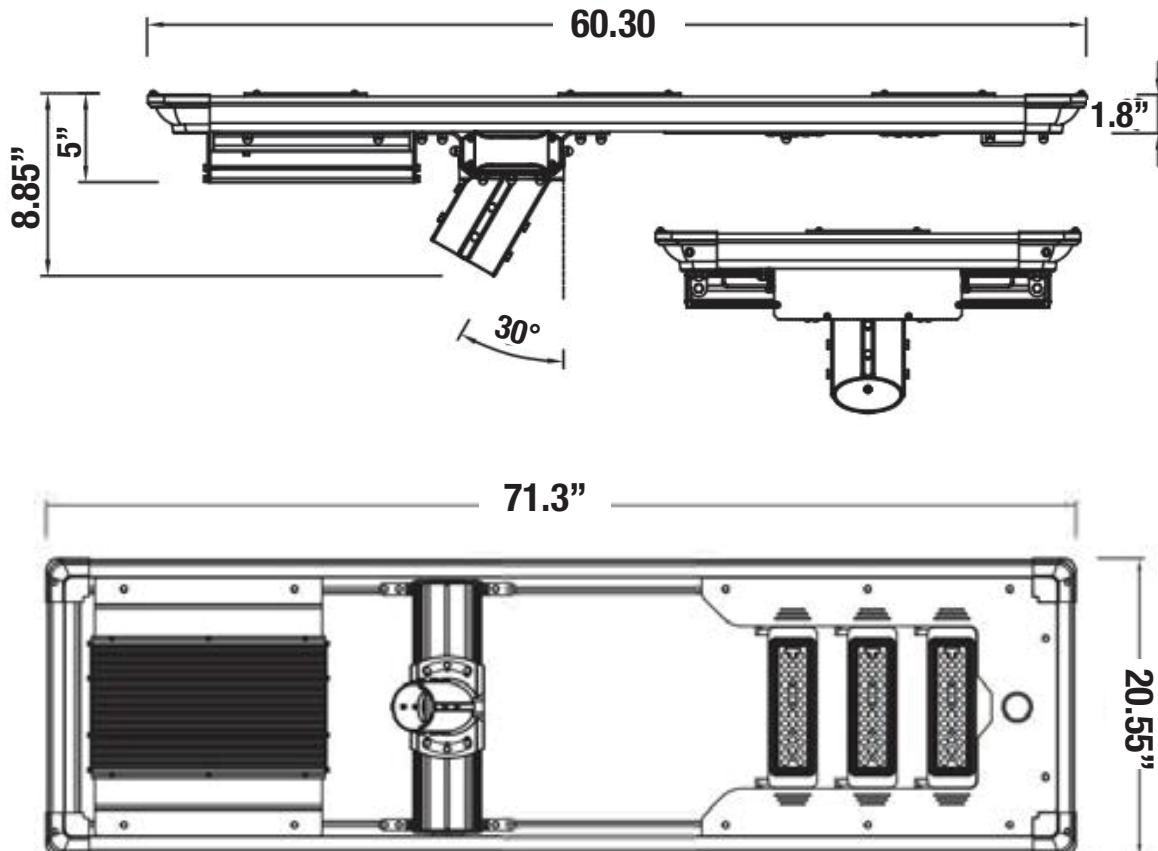
Matters Need Attention

9. Walls, glass, and ceramics will bring reflection and penetration attenuation of electromagnetic waves, and reduce the sensing distance of the sensor. The thicker the material is, the more serious the attenuation is.
10. The movement of animals and objects within the sensing range may cause the light to turn on, which is a normal phenomenon
11. The electromagnetic wave emitted by microwave sensor in the practical application environment, the different reflectivity of obstacles will lead to different induction range, which is normal phenomenon.
12. Please turn on the power switch of the fixture before use, and test whether it is functional before installation.
13. Ensure that the power switch is on when working normally. Please test whether the lamps are charged and discharged normally before installation (the solar panel is charged by sunlight and the lamp is off; Solar panels blocked sunlight do not charge the light) .
14. View the entire installation guide. Do not disassemble by non-professional technicians or under the guidance of professional technicians.
15. Do not place the product in water or fire, as there may be explosion risk.
16. Please pay attention to the secondary transport protection, do not damage the lamp.
17. Disposal at end of life: Battery to be removed by professional.
18. The product contains lithium batteries, please follow the air transport regulations when shipping, should be regarded as flammable and explosive goods, storage should be separated from other items to avoid damage.
19. Charging and discharging requirements: Charging temperature is 0-45°C, discharging temperature is -10-60°C; Storage temperature: -1060°C.
20. The installation distance, both transverse and longitudinal, should be greater than 1.5m. Individual lamps may be a misfit if the installation distance is too close.
21. The Company reserves the right of final interpretation of the product.

DIMENSIONS



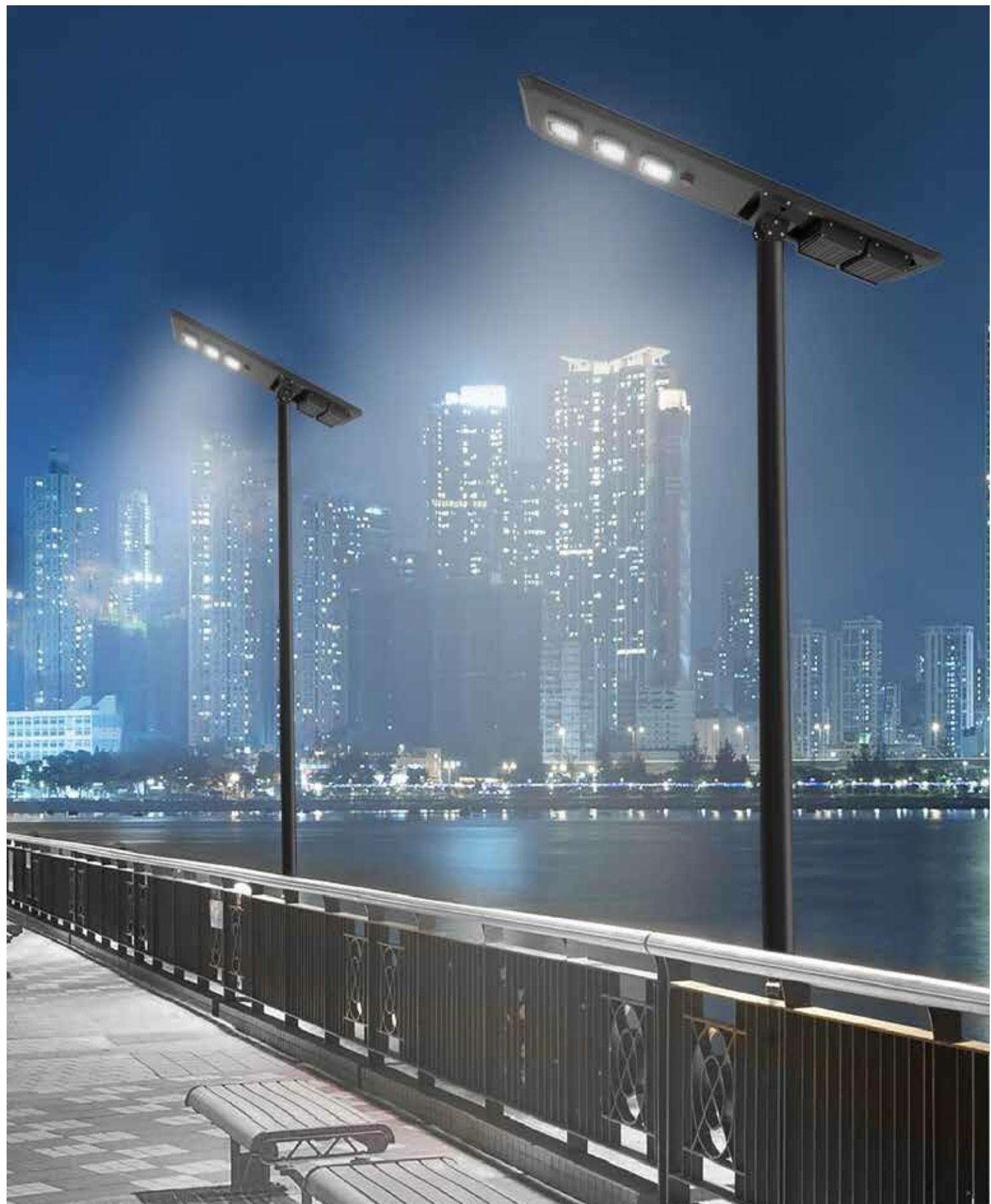
DIMENSIONS





ATHENS

Solar LED Street Light 100W/80W



3 Year
Limited
Warranty