



*ISO9001:2000 Certified*

# FS-S300W

## Solar Street Light

# User Manual

DONGGUAN SUNWORTH SOLAR ENERGY CO.,LTD

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Based on the working principle of Solar Power System, the Solar Street Light is widely applied to provide illumination for roads, social community, park and the like. The Solar Street Light has the advantages of easy installation, stable working, energy saving, and long life-time, and to beautify the city by wire-free, maintenance-free and environmental-free. Nowadays, the green energy source is widely advocated in the whole society.	
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Notes: Thank you for purchasing FS-S series Solar Lights. To ensure the safety of using these products, please peruse the User Manual before installation.

## I Accessories List

Please check & ensure all accessories completed before installation.

### Packing List

Item No.	Part	Specification/Model No.	Qty	Remarks
1	Solar Panel	FS-PV150W	2	150Wp/36V
2	Storage battery	100AH/12V	2	Maintenance-free, lead-acid
3	Controller	CML15-2.1-NL	1	24V/15A, with User Manual
4	Pole	7.5m	1	
5	Arm of Solar Light	1.2m	1	
6	Lamp Head	D10	1	Including Rectifier
7	Low-power Sodium Lamp	55W/24V DC	1	Including Swinging Ring and Bug-prevented plastic gasket
8	Controller Box	500*230*650	1	Including Round Hoop
9	Bracket of Solar Panel	7 parts	1	Refer to 5.2.1
10	Flange of bracket	400*400*370	1	
11	Cable	RVV 2.5*2	1	For Solar Panel
12	Cable	RVV 1.5*2	1	To connect load
13	Wire	BVR 4	3	To connect Storage Battery
14	Bolts	Outer Hexagon, M12*25	9	For flange of bracket
15	Bolts and Nuts	Outer Hexagon, M10*30	8	For Solar Panel Bracket
16	Bolts and Nuts	Inner Hexagon, M10*25	16	
17	Bolts and Nuts	Outer Hexagon, M8*20	8	
18	Bolts and Nuts	Outer Hexagon, M8*30	4	
19	Bolts and Nuts	Outer Hexagon, M10*50	4	
20	Bolts and Nuts	Inner Hexagon, M6*20	16	For Solar Panel
21	Bolts and Nuts	Outer Hexagon, M10*55	8	For Lamp Arm
22	Bolts and Nuts	Outer Hexagon, M12*40	4	For Controller Box
23	Bolts	“+” Head, M3*18	2	For Controller
24	Tools (free of charge)	M6 Inner Hexangular Wrench	1	
		M10 Inner Hexangular Wrench	1	



		14-17mm Open End Wrenches	1	
		17-19mm Open End Wrenches	1	
25	Materials (free of charge)	Ø25 *500 Fire-retardant Conduit Pipe	2	
		Vaseline	1	
		Auto-Paint	1	
		Nylon Strapping	1	

## II Summary

Based on the working principle of Solar Power System, the Solar Street Light is widely applied to provide illumination for roads, social community, park and the like. The Solar Street Light has the advantages of easy installation, stable working, energy saving, and long life-time, and to beautify the city by wire-free, maintenance-free and environmental-free. Nowadays, the green energy source is widely advocated in the whole society.

## III Working principle

Solar Street Light is mainly composed of solar panel, controller, storage battery, lamp, and pole(please refer to the illustration 1).

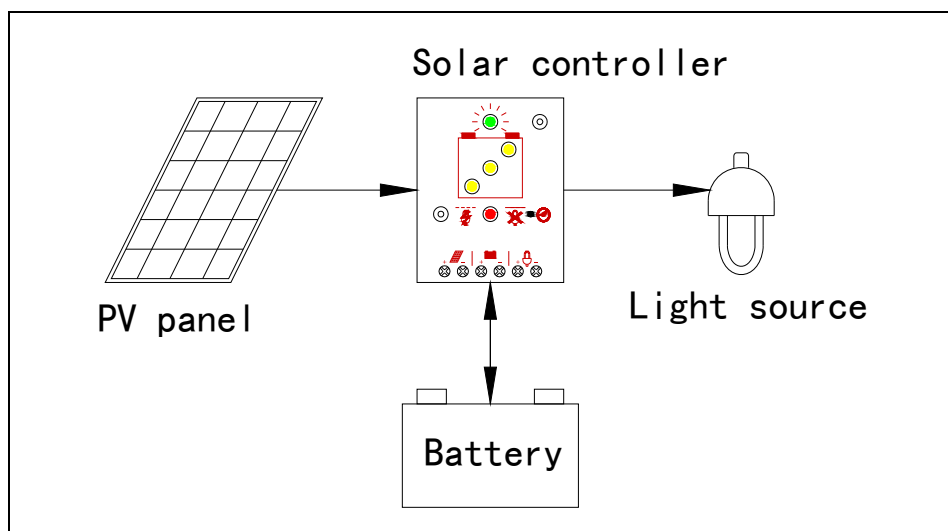







Illustration 1: Solar street light system



Working principle: As illustration 1, solar panel converts ray energy to DC power and stores the power into battery via controller in daytime. At dusk, the load terminal of Controller will open automatically and the storage battery could supply power for Light during the set-up time period, and could be turned off while the time is up. Namely to charge in daytime and discharge in nighttime, and the Solar Street Light works everyday in cycles.

#### IV、Attention

Please read this User Manual carefully before using this Solar Street Light and keep this manual well.

 Warning	
Please operate this products by professional persons	
	<ul style="list-style-type: none"> <li>● It is dangerous if operate incorrectly</li> </ul>
Do not contact electricity while install, operate, set-up and maintain.	
	<ul style="list-style-type: none"> <li>● It could generate DC power when the Solar Panel with irradiation of sunshine or lamp-houses.</li> <li>● Please wear a pair of glove when check or maintain , otherwise maybe get an electric shock when touch the solar panel or battery conductor</li> <li>● Please disconnect the input power supply when install or maintain in order to avoid getting an electric shock as the ballast output is <b>high voltage electricity</b>.</li> </ul>
	<ul style="list-style-type: none"> <li>● Please reserve ,move carefully           <ul style="list-style-type: none"> <li>● The reservation environment temperature should be -20℃~50℃, relative humidity under 90% without bead; Isolate the erosive gas and liquid.</li> </ul> </li> <li>● Please charge the battery termly which do not be used usually.</li> <li>● Please move carefully and avoid missing the accessories.</li> </ul>
<ul style="list-style-type: none"> <li>● Please do not use this product for lighting at the place of high reliability requested.</li> </ul>	
	<ul style="list-style-type: none"> <li>● It may happen life accident if the power output stability effected by weather.</li> </ul>



## V、Installation and Usage

### 5.1、Installation for Lamp

#### 5.1.1、Cautions

Attention as below:

- Suit the limitations of criterions and standards
- Suit the environment and climate
- Should be installed by professional designer and operator
- Pay attention to the security when install the Lamp Pole.
- Do not scrape the insulation layer and drag the cables
- Do not put the cables into the lamp arms and gaps
- Please make sure the pole is upright and stable , do not be loose and lean

#### 5.1.2、Installation Step

1、 Please put the solar panel cable and the loaded equipment cable into the pipe of the lamp pole and tie in order to avoid sliding when hanging

2、 Please put the lamp pole cable hole and the lamp arm cable hole in a line before screwing the arm lamp

3、 Please adjust the arm direction before screw the lamp pole into the ground

4、 Please check the screw fastness of the rectifier, **Lamp Tube Swinging Ring** and Reflector before installing the lamp head

5、 Please adjust the lamp irradiation direction first and then screw the Lamp Head stably.

6、 Please put the bug prevented plastic gasket into the rump of lamp and inset the lamp tube into the lamp holder.

7、 Please pay attention to the rectifier anode and cathode.

Remark: May install the Lamp , Solar Panel and Controller Box on the ground then hang up the lamp pole and adjust the bracket direction according to the spot status , but please pay attention to protect the solar panel , chimney and the glassware etc



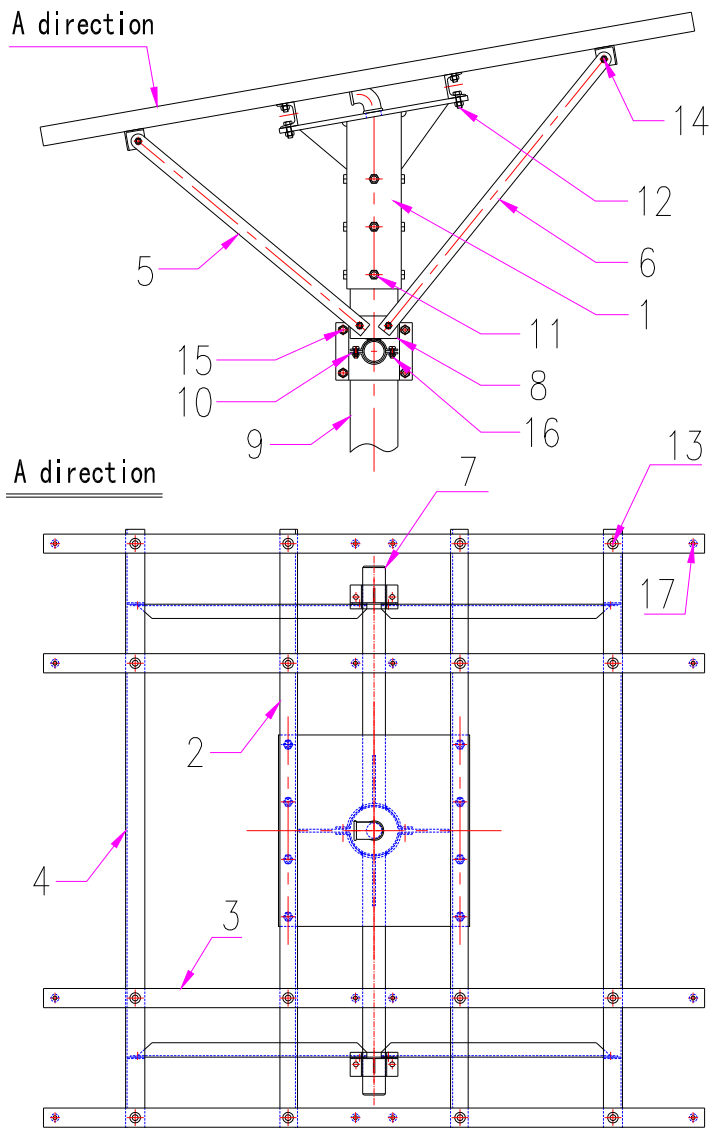
## 5.2、Installation for Solar Panel

### 5.2.1、Attention

Please pay attention as below

- Please cover the surface of the solar panel before installing because it could generate the electricity if the solar panel exposed in sunshine
- Do not touch the terminal of solar panel otherwise may get an electric shock
- Do not hurt the solar panel back
- Do not stand on the solar panel
- Do not mess the junction wires of solar panel in the gap of bracket and lamp pole.
- **5.2.1、 Installation Step for Solar Panel**

Please install the solar panel bracket as below like Illustration 2 before installing the solar panel



Pic.2 Assembly Drawing of solar panel mounting bracket

Part code	Name	Spec.	Qty	Unit	Remark
1	Flange of bracket	400×400×370	1	Pcs	
2	Crossbeam	“□”type×1180 (L)	2	Pcs	
3	Cross mounting picul	“□”type×1384 (L)	4	Pcs	
4	Supporting girder	“L”type×1180 (L)	2	Pcs	
5	Front support	“L”type×640 (L)	2	Pcs	
6	Back support	“L”type×750 (L)	2	Pcs	
7	Supporting arm	Ø48×470	2	Pcs	
8	Supporting stand	-	2	Pcs	





	base				
9	Pole	-	1	Pcs	
10	Round hoop of supporting stand base	-	2	Pcs	
11	Bolts	Outer Hexagon, M12*25	9	Pcs	Connect 1&9
12	Bolts and Nuts	Outer Hexagon, M10*30	8	Set	Connect 2&1
13	Bolts and Nuts	Inner Hexagon, M10*25	16	Set	Connect 3&2,4
14	Bolts and Nuts	Outer Hexagon, M8*20	8	Set	Connect 5,6&4,8
15	Bolts and Nuts	Outer Hexagon, M10*50	4	Set	Connect 7
16	Bolts and Nuts	Outer Hexagon, M8*30	4	Set	Connect 8&10
17	Bolts and Nuts	Inner Hexagon, M6*20	16	Set	Fix solar panel

Solar panel mounting bracket assembly step:

1. First, lie down the pole on the ground, use M10\*30 and M10\*25 bolts and nuts fix well part code#1/2/3/4(match the part code in the drawing) on the top of the pole.
2. Let the cable of solar panel go through the flange of bracket.
3. Adjust the incline direction of bracket, face to the right south, use M12\*25 bolt fix well the flange of bracket.
4. Then install part code #5/6/7/8/10(match the part code in the drawing)
5. Screw well all the bolts and nuts on the bracket.
6. Open the junction box of solar panel before install solar panel.
7. Install solar panel with M6\*20 bolts (add one flat gasket on upper and lower surfaces),please set the junction box direction of two 150W solar panels on the same side.
8. Connect the cable to solar panel, please take note of the “+”\_”polarity in right connection, same color of the wire should be the same polarity (see 5, 4)
9. Close the cover of junction box, tidy up and enlance the cables.

### 5.3. Installation of Control Box

#### 5.3.1 Cautions:

Since the controller and battery will be placed in Controller Box, please pay attention to the following items when install:



- Prevent the short circuit of battery connection. Do not converse connections.
- Be careful do not damage the battery when open the Control Box, do not draw the battery's terminals.
- Fast connection of controller and battery, keep clean on the connection areas.
- Connect batteries first, then connect solar panel and loads.
- When connect batteries, please connect the battery in series first, then connect to controller, finally connect to the terminals of batteries.

### 5.3.2 Installation step of Control Box

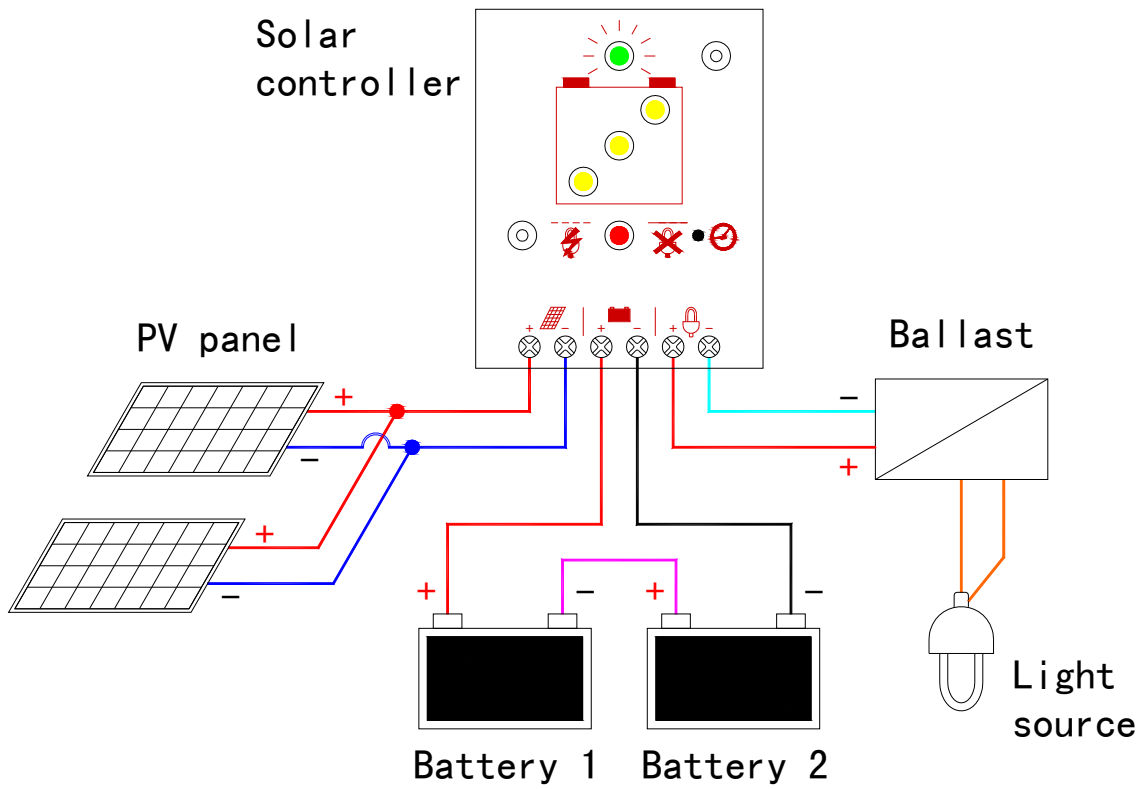
1. Install Control Box on the platform of lamp pole with round hoop.
2. Put batteries into Control Box, place terminals on the out side.
3. Install controller, wipe up the terminals of batteries to be metal brightness, connect cables according to drawing 3(pay attention to “+” “\_” polarity.)
4. Daub anticorrosive Vaseline on the terminals of batteries.
5. Install shelf bar of batteries.

## 5.4. Solar Street Light Construction Drawing

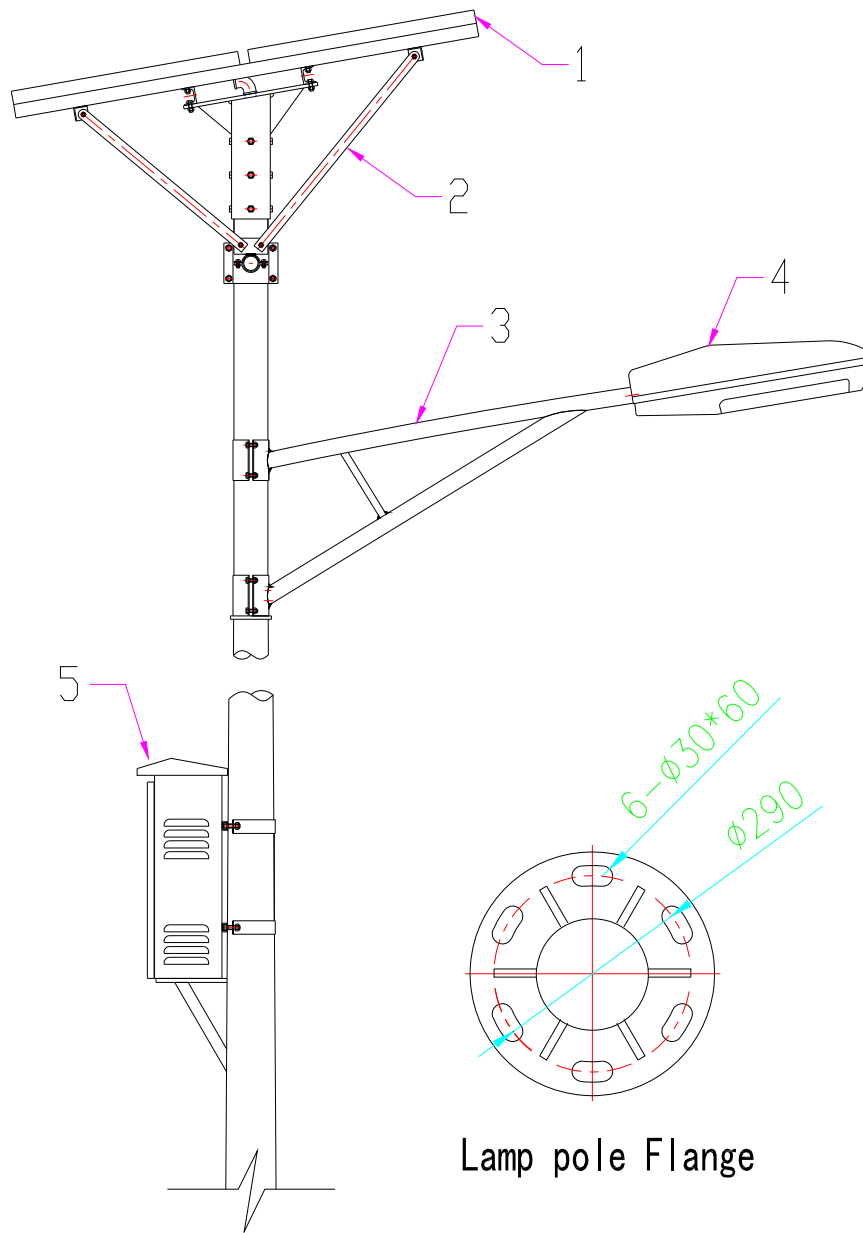
After finish above installation steps, the whole construction is as drawing 4

### 5.5 Diagram of Electrical Connection

This model of solar street light uses 2pcs of **36V/175W** solar panel in parallel connection to form 36V/300W PV array. Use 2pcs of 12v/100Ah battery in series connection to form 24V/100AH battery bank. Electrical connection diagram is as drawing 3.



Drawing 4 electrical connection diagram



Drawing 4 construction drawing of solar street light

Part code	Name
1	Solar panel
2	Mounting bracket of solar panel
3	Lamp arm
4	Lampshade
5	Control Box
6	Pole



## 5.6、 Usage

### 5.6.1、 Notice :

- Don't open the cover of junction box in order to avoid electric shock.
- Don't touch PV panel avoid scald
- Don't take apart or reassemble battery array
- Don't connect load to battery array for long time
- Don't open electric control box avoid any damage of inside component.

### 5.6.2、 Usage

Detail refer to controller manual

## VI Technical Index

Height: 7.5m

PV panel: 300Wp/36V

Battery: 24V100Ah

Controller: 24V15A

Light source: 55W

Voltage: DC24V

Switch lux : <40Lux

Working temperature:  $-20^{\circ}\text{C} - +65^{\circ}\text{C}$

Defend grade: IP 55

Wind-throw resistance 120Km/h

## VII、 Malfunction or Solution

- 1、 First time to usage , battery array should be continuous charged above two sunny days.
- 2、 In continuous rainy days, it is normal if solar light may not operate.
- 4、 Solar Street light only start to operate when the ray is weak in the evening. It is normal that solar light will not operate when the ray is strong.
- 5、 No output, please check whether any loose of load cable
- 5、 When the battery array Can not be charged , please check the connection of all cables in battery and PV panel.



- 6、 Other malfunction or solution detail refer to this solar street controller manual
- 7、 Solar light still can not operate if you try all the above solutions. Please contact us immediately

### VIII、 System Maintenance

- 1、 Forbid opening the door of control box .
- 2、 Maintenance must be done by trained professional.
- 3、 Professional should check system status regularly and should keep well of the operation record.
- 4、 If any failure, professional should solve problem and fill maintenance record.
- 5、 Control box inside should keep good ventilation and cleanness. Well done of Rat proof, prevention of burglary and fire proof, dust proof.
- 6、 Professional maintains system regularly as per the following item and write down record. If local environment is bad, maintenance should be high frequency than normal.

Maintenance item	Time
Check any broken falling object after windstorm disaster	
Check PV Panel	Annually
Check any corrosion or loose of bracket	Annually
Check inside cleanness of controller box; please keep clean if it is dirty.	Semiannually
Check any loose of the connection of all cables	Annually
When float charging, check total voltage, single voltage, and surface	Semiannually
Check any loose of connection for battery and controller	Annually
keep clean on the surface of PV panel	According to situation

- 7、 Maintenance for battery array. Detail refer to battery array manual
- 8、 Please contact us immediately if any failure out of your control .



### **Thanks to your comments**

#### Disclaimer

1. This product is suitable for the area with 2000 hours solar radiation per year.
2. The product has different performance in different area or seasons.
3. Cause any damage or accident under any unusual condition, we do not undertake the responsibility.
4. The right of final interpretation belongs to Dongguan Sun Worth Solar Energy Co., Ltd.

<http://www.sunworth.com>