

Solar Street Light Troubleshooting and Solutions

Fault Category 1: Light Does Not Turn On

Possible Cause	Troubleshooting Steps	Solution	Notes
a. Insufficient battery power	Check battery voltage (normal range: 12V system 11.1V-12.6V, 3.2V system 2.8V-3.6V)	Charge the battery for 12-24 hours	Check all connections regularly, especially after rainy weather, to ensure waterproof sealing is intact
b. Poor contact of photovoltaic panel or controller connection	Check whether the photovoltaic panel and controller wiring are loose or corroded	Re-tighten the wiring and clean the oxidized contacts	
c. Incorrect controller mode setting (such as “test mode” or “off mode”)	Check controller indicator light status and confirm current mode	Switch to “automatic mode” or reset controller settings	
d. Controller malfunction	a. Check whether the controller indicator light is on b. Test whether the controller output voltage is normal	Replace the controller	Refer to controller manual
e. Photovoltaic panel malfunction	a. Check whether the photovoltaic panel surface is covered (such as by	a. Clean the photovoltaic	

Possible Cause	Troubleshooting Steps	Solution	Notes
f. LED light source damage	fallen leaves, bird droppings)	panel surface	
	b. Test whether the photovoltaic panel output voltage is normal (should be >15V under sunlight)	b. Replace the photovoltaic panel	
g. Wiring short circuit or open circuit	a. Check whether the LED light source has visible burn marks	Replace the LED light source	
	b. Test whether the LED light source can light up when directly connected to the battery		
	a. Check whether the wiring is damaged, exposed, or bitten by rodents	Repair or replace damaged wiring	Use waterproof cable glands and rodent-proof conduit to prevent wiring damage
	b. Use a multimeter to test circuit continuity		

Fault Category 2: Insufficient Brightness

Possible Cause	Troubleshooting Steps	Solution	Notes
a. Insufficient battery power	Check battery voltage	Charge the battery or replace the battery	
b. Photovoltaic panel surface is dirty	Check whether the photovoltaic panel surface has dust or debris accumulation	Clean the photovoltaic panel surface	
c. LED light source aging	Check LED brightness attenuation		

Possible Cause	Troubleshooting Steps	Solution	Notes
		Replace the LED light source	Adjust according to actual
d. Controller is set to “energy-saving mode” or “half-power mode”	Check controller settings	Adjust to “full power mode” or “high brightness mode”	to actual needs to balance brightness and endurance
e. Insufficient power	a. Check whether the photovoltaic panel power matches the LED light source power b. Check whether the battery capacity is sufficient	a. Replace with higher power photovoltaic panel b. Increase battery capacity	
f. Aging battery, reduced capacity	Test battery actual capacity (compared with rated capacity >2.5Ah ²)	Replace the battery	

Fault Category 3: Short Lighting Duration

Possible Cause	Troubleshooting Steps	Solution	Notes
a. Insufficient battery capacity	Check battery capacity specification	Replace with higher capacity battery	Adjust according to actual lighting needs to ensure at least 2-3

Possible Cause	Troubleshooting Steps	Solution	Notes
			rainy day reserves
b. Insufficient charging time	a. Check whether the photovoltaic panel installation angle is reasonable (should face south, tilt angle 15°-45°) b. Check whether there are obstructions around the photovoltaic panel	a. Adjust photovoltaic panel angle b. Remove obstructions or relocate installation position	
c. Photovoltaic panel power is too low	Check whether the photovoltaic panel power matches the system configuration	Replace with higher power photovoltaic panel	
d. Aging battery, reduced capacity	Test battery actual capacity	Replace the battery	
			Adjust
e. Controller discharge protection setting is too conservative	Check controller discharge cut-off voltage setting	Adjust controller discharge cut-off voltage (not recommended to be too low to avoid battery over-discharge)	according to battery type, lithium iron phosphate battery cut-off voltage is recommended to be 10V-11V
f. LED light source power is too high	Check whether the LED light source power matches the system configuration	Replace with lower power LED light source or increase battery/	

Possible Cause	Troubleshooting Steps	Solution	Notes
		photovoltaic panel capacity	

Fault Category 4: Frequent Flashing or Unstable Lighting

Possible Cause	Troubleshooting Steps	Solution	Notes
a. Poor contact	Check whether all wiring connections are firm	Re-tighten all connections	
b. Controller malfunction	Check controller indicator light status	Replace the controller	
c. Unstable battery voltage	Test battery voltage fluctuation (should be stable within $\pm 0.5V$)	Replace the battery	
d. Insufficient power	Check whether the photovoltaic panel and battery configuration match the LED light source power	Increase photovoltaic panel or battery capacity	Ensure system configuration is reasonable to avoid overload operation
e. LED light source driver damage	Test LED light source driver output voltage stability	Replace the LED light source or driver	
f. Electromagnetic interference	Check whether there are strong electromagnetic interference sources nearby (such as high-voltage lines, transformers)	Install anti-interference filter or relocate installation position	
g. Controller program error	Try to reset the controller (refer to manual operation)	Reset the controller or upgrade firmware	Contact manufacturer technical support

Fault Category 5: Light Does Not Turn Off During the Day

Possible Cause	Troubleshooting Steps	Solution	Notes
a. Controller light sensor malfunction	Check whether the controller light sensor is covered or damaged	Clean the light sensor or replace the controller	
b. Controller mode setting error (such as “manual mode” or “always-on mode”)	Check controller settings	Switch to “automatic mode”	
c. Wiring error (photovoltaic panel connected incorrectly)	Check whether the photovoltaic panel wiring is correct (positive and negative poles should correspond to controller input)	Reconnect the wiring correctly	Refer to wiring diagram to ensure correct connection

Fault Category 6: Battery Cannot Be Charged

Possible Cause	Troubleshooting Steps	Solution	Notes
a. Photovoltaic panel malfunction	Test whether the photovoltaic panel output voltage is normal (should be >15V under sunlight)	Replace the photovoltaic panel	
b. Controller charging circuit malfunction	Check whether the controller charging indicator light is on	Replace the controller	
c. Battery aging or damage	Test battery voltage and internal resistance	Replace the battery	
d. Wiring open circuit or poor contact	Check whether the photovoltaic panel to controller wiring is intact	Repair or replace the wiring	

Fault Category 7: Photovoltaic Panel or Lamp Housing Damage

Possible Cause	Troubleshooting Steps	Solution	Notes
a. Photovoltaic panel glass cracked	Check whether the photovoltaic panel surface has cracks or damage	Replace the photovoltaic panel	Avoid heavy object impact, regularly check photovoltaic panel integrity
			Choose products with high wind resistance level to reduce the risk of damage
b. Lamp housing deformed or cracked	Check lamp housing integrity	Replace the lamp housing or entire light pole	Regularly check light pole anti-corrosion layer, especially in coastal or high humidity areas
c. Corrosion or rust of light pole	Check whether the light pole surface coating is intact	Perform anti-rust treatment or replace the light pole	

Fault Category 8: Abnormal Controller Indicator Light

Possible Cause	Troubleshooting Steps	Solution	Notes
a. Controller fault code prompt	Check controller indicator light flashing pattern (refer to manual to interpret fault code)	Troubleshoot according to fault code prompt	Contact manufacturer technical support
b. Controller program error	Try to reset the controller	Reset the controller or upgrade firmware	

Maintenance Recommendations

- 1. Regular Inspection:** It is recommended to conduct a comprehensive inspection every 3-6 months, including photovoltaic panel cleanliness, wiring connection status, battery voltage, etc.
- 2. Timely Cleaning:** Clean the photovoltaic panel surface regularly to ensure power generation efficiency.
- 3. Waterproof Inspection:** Especially after rainy seasons, check whether the waterproof sealing of all connection parts is intact.
- 4. Record Keeping:** Establish equipment maintenance records to track equipment operation status and facilitate troubleshooting.
- 5. Professional Support:** For complex faults, contact manufacturer technical support in time to avoid improper operation causing greater damage.