Lighting Global Product Testing Verification

Power Equation Solar Home Power Station with 3 light Bulbs, Radio and Flashlight

Expiration Date: January 31, 2022¹
Verify here: www.lightingglobal.org/products/ri-hpsrf

This verifies that the Solar Home Power Station with 3 light Bulbs, Radio and Flashlight was tested according to the Quality Test Method stipulated in edition 4 of IEC 62257-9-5² and complied with the Lighting Global Pico PV Quality Standards.³

Testing Details:
Product Name: Solar Home Power Station with 3 light Bulbs, Radio and Flashlight
Model Number: RNTS022
Company Name: Renewit Solar Limited
Country of Origin: China
Company Contact: Richard Atwal, richard@renewit.com
Original QTM Sample Size: n=6
Renewal Test Conducted: yes
Sample Procurement Method: Random warehouse sampling
Testing Laboratory: Shenzhen Academy of Metrology and Quality Inspection, Shenzhen, China

Documentation:
Specifications sheet with verified test results and original version of this verification:
www.lightingglobal.org/products/ri-hpsrf

Russell Sturm
Global Head, Energy Access
Lighting Global Project Manager
International Finance Corporation

¹ Lighting Global requires re-testing every two years or upon major product revisions, and in special cases reserves the right to grant an extension on results validity.
² www.lightingglobal.org/quality-assurance-program/
³ www.lightingglobal.org/quality-assurance-program/our-standards/
## Type Approval

### Solar Home Power Station with 3 light Bulbs, Radio and Flashlight

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| Truth In Advertising              | Manufacturer, Product Name and Model Number accurately specified  
  Performance and Component Ratings accurately specified. Any description of the product that appears on the packaging, inside the package and in any media shall be truthful and accurate. No statements mislead buyers or end users about the utility of the product. Numeric ratings deviate no more than 15% from actual performance (note that it is acceptable for actual performance to exceed advertised performance).  
  Port voltage and current specifications, if provided, are accurate. Included appliances function when connected to ports. Power output of ports is sufficient to power appliances that are advertised but not included. Ports that are intended for a function other than providing power, such as data ports, are not required to meet this standard. | Pass    |
| Lumen Maintenance                 | Average relative light output $\geq 85\%$ of initial light output at 2,000 hours with only one sample allowed to fall below 75% OR All 6 samples maintain $\geq 95\%$ of initial light output at 1,000 hours | Pass    |
| Circuit and Overload Protection   | Products include a current limiting mechanism to prevent irreversible damage to the system. The mechanism is easily resettable or replaceable by the user, or automatically resets. If replaceable fuses are used for circuit protection, sizes are labeled on the product and listed in the user manual, and, if fuses are replaceable by the user, at least one spare fuse is included with the product. Included appliances are not required to meet this standard unless they have ports that are intended to provide power. | Pass    |
| AC-DC Charger Safety              | Any included AC-DC charger carries approval from a recognized consumer electronics safety regulator                                                                                                               | n/a     |
| Hazardous Substances Ban          | No battery may contain cadmium or mercury at levels greater than trace amounts                                                                                                                                | Pass    |
## Battery Protection

Protected by an appropriate charge controller that prolongs battery life and protects the safety of the user. 5 out of 6 samples meet the requirements outlined in Lighting Global Quality Standards. Lithium batteries carry IEC 62281, IEC 62133-2, UL 1642 or UN 38.3 certification and have overcharge protection for individual cells or sets of parallel-connected cells. Batteries of included appliances must also meet this standard.

### Verdict
Pass

## Battery Durability

The average capacity loss of 6 samples does not exceed 25% and only one sample may have a capacity loss greater than 35% following the battery durability storage test as defined in IEC/TS 62257-9-5 Annex BB

### Verdict
Pass

## PV Overvoltage Protection

If the battery is disconnected or isolated, the system is not damaged and the load terminals maintain a voltage that is safe for their intended uses.

### Verdict
Pass

## Miswiring Protection

The user interface is designed to minimize the likelihood of making improper connections. If improper or reversed connections can easily be made, they cause no damage to the system or harm to the user.

### Verdict
Pass

## Physical Ingress Protection

IP2X for all products, IP3X (or 2X + circuit protection) for PV modules, IP5X for fixed outdoor products

### Verdict
Pass

## Water Ingress Protection

Degree of protection required is based on product type:
- Fixed separate (indoor): No protection required
- Portable separate: Occasional exposure to rain
- Portable integrated: Frequent exposure to rain
- Fixed integrated (outdoor): Permanent outdoor exposure
- PV modules: Outdoor rooftop installation

### Verdict
Pass

## Drop Test

Fixed separate (indoor): No requirement
All other products: 5 out of 6 samples are functional after drop test; none result in dangerous failures.

### Verdict
Pass

## Soldering and Electronics Workmanship

The system and any included appliances are rated “Good” or “Fair” for workmanship quality as defined in Annex F of IEC/TS 62257-9-5. At most, one sample may fail to function when initially evaluated.

### Verdict
Pass

## Mechanical Durability

All samples and included appliances are functional after Switch, Connector, Gooseneck and Strain Relief tests; none result in dangerous failures.

### Verdict
Pass
Type Approval Continued
Solar Home Power Station with 3 light Bulbs, Radio and Flashlight

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<tr>
<td>Minimum Warranty Terms</td>
<td>Accurately specified and consumer-facing; minimum coverage of at least one year on manufacturing defects under normal use, including the battery and included appliances.</td>
<td>Pass</td>
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<tr>
<td>Performance Reporting</td>
<td>Light output and the corresponding solar run time are reported on the product packaging for at least the brightest setting.</td>
<td>Pass</td>
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<td></td>
<td>Impact of mobile phone charging on product performance is described on packaging.</td>
<td>Pass</td>
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Additional details on the requirements listed above are provided in the Lighting Global Quality Standards, available here: www.lightingglobal.org/quality-assurance-program/our-standards/

Products are tested according to the test methods described in edition 4 of IEC/TS 62257-9-5 and meet the Lighting Global Pico-PV Quality Standards.