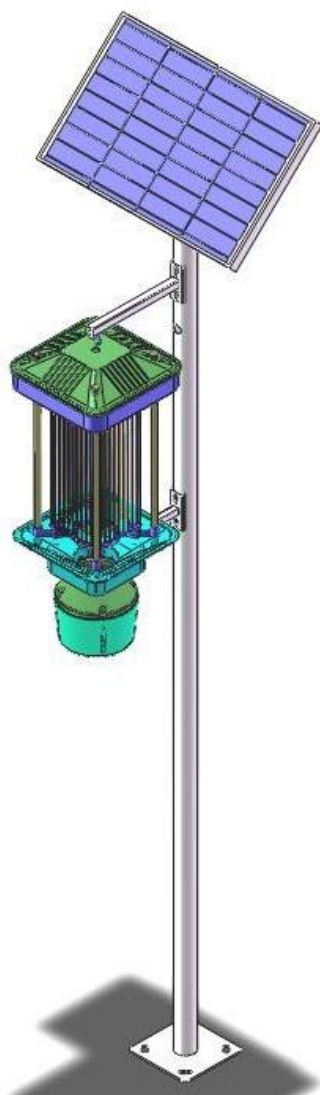


Frequency vibration solar insecticidal lamp

User Manual



Changsha Zoko Link Technology Co., Ltd.

Insecticidal Lamp Overview

As our company continuously improves its products, the product you purchased may differ slightly from the illustrations in the manual, and no separate notice will be provided. Please refer to the actual product. Read this manual carefully before use and keep it properly.

Product Introduction

The frequency vibration solar insecticidal lamp is a new type of insect-killing device. It utilizes the phototaxis principle of pests, attracting them with a specific wavelength light source and killing them with a high-voltage electric grid. It employs frequency vibration induction control technology and bears a safety mark compliant with the national standard GB/T24689.2-2017 for plant protection machinery frequency vibration insecticidal lamps.

Product Applications

The frequency vibration solar insecticidal lamp is widely used in agriculture, forestry, vegetables, tobacco, warehousing, winemaking, gardens, orchards, urban greening, aquaculture, and particularly in areas affected by cotton bollworms. It can effectively attract and kill various pests in agriculture, forestry, fruit trees, and vegetables, including cotton bollworm, scarab beetles, cutworms, corn borers, fruit moths, beet armyworms, spodoptera litura, pine caterpillars, fall webworms, longhorn beetles, and 1,287 species across 87 families.

Design Principle

The solar frequency vibration insecticidal lamp converts sunlight into electrical energy during the day using solar panels, storing it in maintenance-free batteries. The system's automatic control components enable light control, time control, rain control, overcharge/over-discharge protection, and automatic delay functions. Developed under the requirements of the Agricultural Machinery Bureau and Science and Technology Bureau, it is tailored to the characteristics of agricultural pest control. It

generates low-temperature plasma through discharge, producing light at a wavelength of $365 \pm 50\text{nm}$, which strongly attracts pests due to their phototaxis, wave attraction, and behavioral tendencies. Pests are lured to the light source, and a high-voltage electric grid surrounding the lamp tube kills or stuns the approaching insects, achieving effective pest control.

Technical Parameters

Lithium Battery	Adopting solar dedicated lithium iron phosphate battery, battery capacity 12Ah, DC12.8V, with overcharge, overdischarge, short circuit protection, battery embedded in the lamp head.
Solar Panel	Monocrystalline silicon panel, power $\geq 40\text{WP}$, actual conversion efficiency $\geq 21\%$, tilted fixed installation on the top of the pole.
Grid Voltage	$\geq 4000\text{V}$
Impact Area	≥ 0.15 square meters
Lamp Type	Adoption of wavelength 320~680nm lamps
Lamp power	$\leq 20\text{W}$
Trap light source wavelength range	320nm-680nm
Lamp pole material	Using 60mm diameter galvanized tube material, 2.0mm wall thickness, the height of the lamp 3 meters.
Appearance	Neat and beautiful appearance, smooth and clean surface, uniform color;

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	reasonable and complete design of each component (no cracks, breaks, gluing, splicing and other defects).
Insect Catch Box	Plastic rotating (or bayonet) type insect collecting box.
Control area	30 to 50 mu (specific reference to the local terrain crops and environmental conditions)
Electrical strength of the whole lamp	The voltage is 5000V for 1min without breakdown.
Electrical strength of high voltage grid	$\sqrt{2}U+750V$, 1min without breakdown.
Safety of High Voltage Grid	The short-circuit current between the two poles of high-voltage grid does not exceed 10mA.
Protection Grade	IP65

Working Mode: High-voltage electric grid

Grid Material and Process: The grid is made of 2mm diameter 304 stainless steel with arc-resistant coating. The grid adopts a double-layer cross-square vertical connection with no joints in the middle. The grid spacing can be adjusted according to different target pests (normally 10mm).

Insulation Pillar (Body) Performance: The insulation pillar (body) must have reliable corrosion resistance and high-voltage endurance. After 30 minutes of continuous arc discharge, the insulation pillar should show no carbonization.

Transformer Protection Measures: The transformer is equipped with protective measures to prevent breakdown or burnout under working conditions.

Light Control Function: At 2LX–20LX, the attractant

light source should automatically turn on, and the insecticidal lamp enters normal operation. At 30LX–200LX, the attractant light source should automatically turn off, and the insecticidal lamp stops working.

Rain Control Function: The insecticidal lamp is equipped with a rain sensor. When humidity exceeds 95% RH, the lamp enters an automatic protection state. When humidity is at or below 95% RH, it resumes normal operation. This means it can automatically enter protection mode during rain and resume work after the rain stops.

Time Control Function: The insecticidal lamp has a time control function, allowing specific time periods to be set for turning on or off based on the habits of different pests.

Insect Attractant Light Source: LED T8-330mm, with a light-emitting surface of ≥ 8 sides, ≥ 80 LED beads, with ≥ 10 beads evenly embedded on each side of an aluminum substrate, arranged in a cylindrical shape. The single aluminum substrate has a length of ≥ 300 mm, width of ≥ 5 mm, and thickness of ≥ 1 mm.

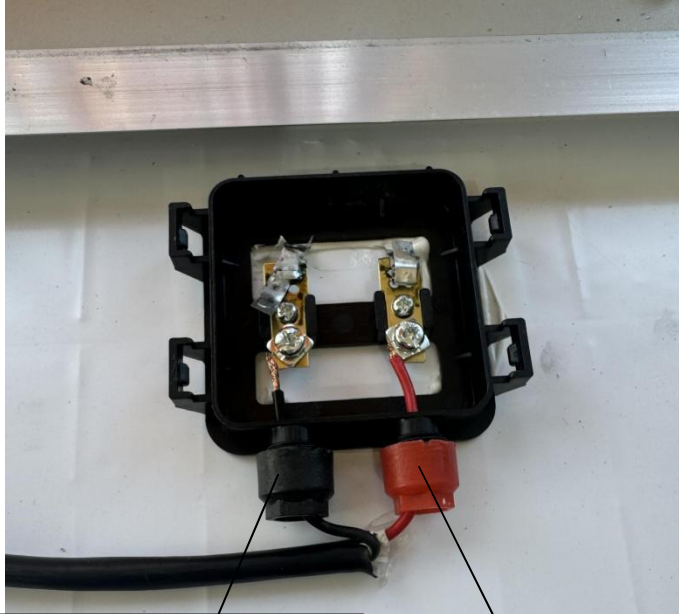
Lamp Body Specifications:

- Working Voltage: DC12V
- Total Lamp Power: <35W
- Startup Time: <5s
- Attractant Light Source Wavelength: 320–680nm (main wavelength 365nm, adjustable with black light or LED tubes of different wavelengths based on target pests).

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Wiring Method

1. The wiring for the solar panel is shown in the following diagram:



The black wire is the negative terminal of the power supply, access it through the black connector hole and press the wire firmly.

The red wire is the positive pole of the power supply, access it from the red connector hole, and press the wire firmly.



Insect control light lamp head (male plug for connection wire)

40W solar panel (female plug for connection)

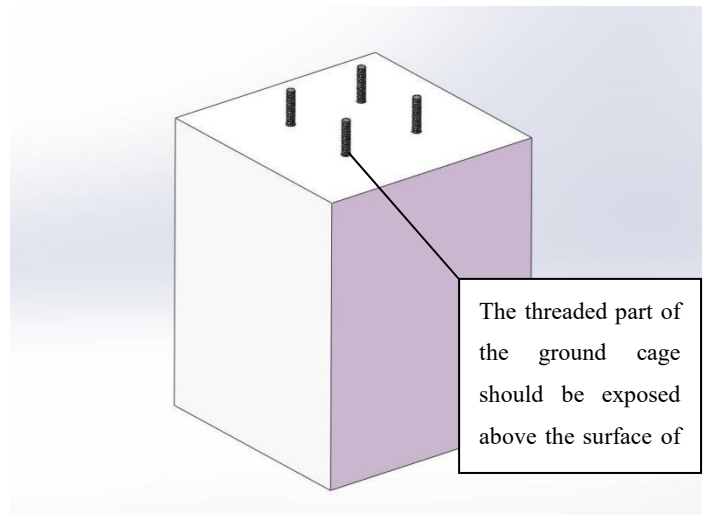
The black wire is the negative terminal of the power supply, access it through the black connector hole and press the wire firmly.

The red wire is the positive pole of the power supply, access it from the red connector hole, and press the wire firmly.

2. Insecticidal lamp head and solar panel power cord male and female plug as shown in the following figure:

Installation Method

1. Ground Cage Installation: Pour a cement-based pillar approximately 400mm×400mm×500mm in size at the installation site. Then, cast the steel reinforcement ground embedding component from the product parts into the cement pillar. The diagram below shows this installation method:

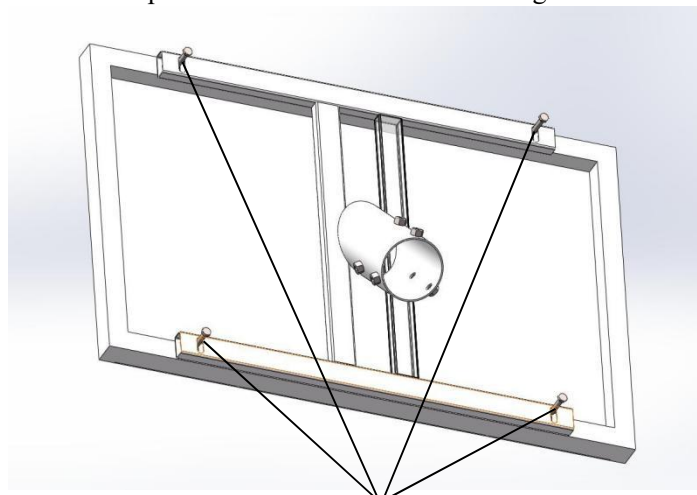


The threaded part of the ground cage should be exposed above the surface of

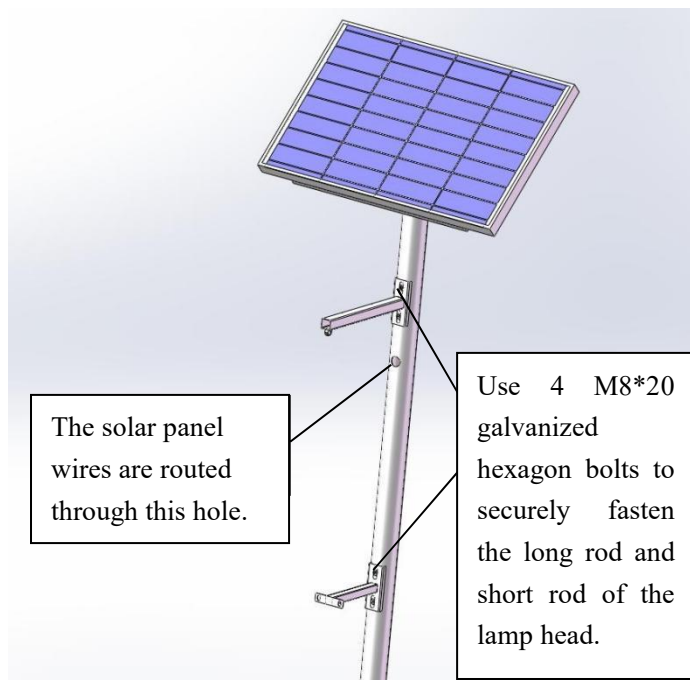
The threaded part of the ground cage should be exposed above the surface of the cement pillar. The threaded area should be protected with insulating tape.

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2.40W solar panel with I-beam bracket mounting:



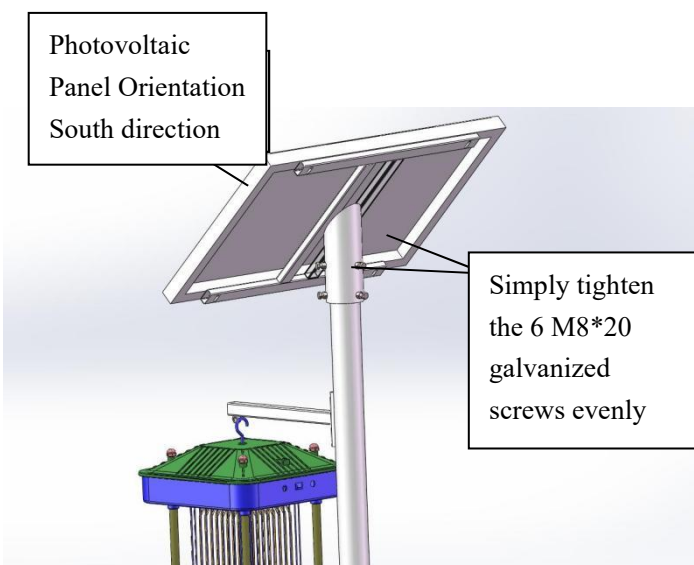
Use 4 sets of M6*30 galvanized hexagon socket screws, along with flat washers, spring washers, and nuts, to secure the 40W solar panel to the I-shaped solar panel bracket.



The solar panel wires are routed through this hole.

Use 4 M8*20 galvanized hexagon bolts to securely fasten the long rod and short rod of the lamp head.

3. 40W solar panel fixed mounted to the pole:



Photovoltaic Panel Orientation South direction

Simply tighten the 6 M8*20 galvanized screws evenly

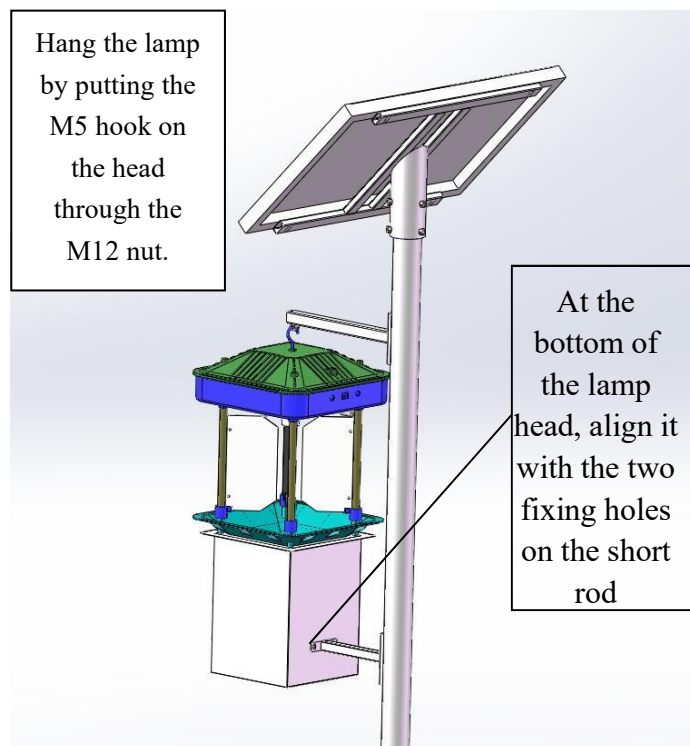
Photovoltaic Panel Orientation: **South direction**

The solar panel wire is threaded through the center into the tube.

Simply tighten the 6 M8*20 galvanized screws evenly.

4. Frequency vibration solar insecticidal lamp head fixing rod installation:

5. Frequency vibration solar insecticidal lamp Head Installation:



Hang the lamp by putting the M5 hook on the head through the M12 nut.

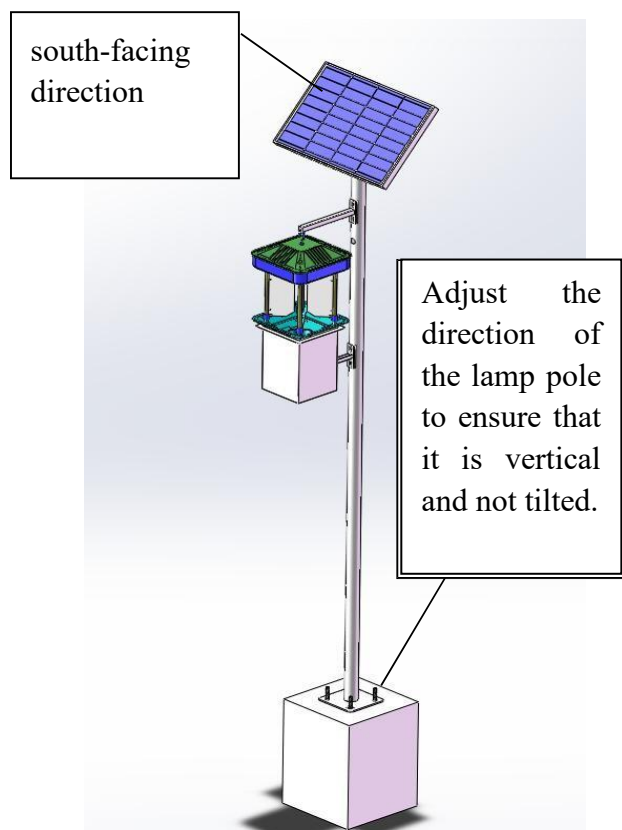
At the bottom of the lamp head, align it with the two fixing holes on the short rod

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Hang the lamp by putting the M5 hook on the head through the M12 nut.

At the bottom of the lamp head, align it with the two fixing holes on the short rod, and secure it using 2 sets of M6*25 galvanized screws.

6. Insecticide lamp pole installation



The panels are installed in a south-facing direction for longer light hours and more efficient power generation.

Adjust the direction of the lamp pole to ensure that it is vertical and not tilted. Then, use 4 sets of M14 nuts, flat washers, and spring washers to securely fasten the lamp pole base to the ground cage threaded rod.

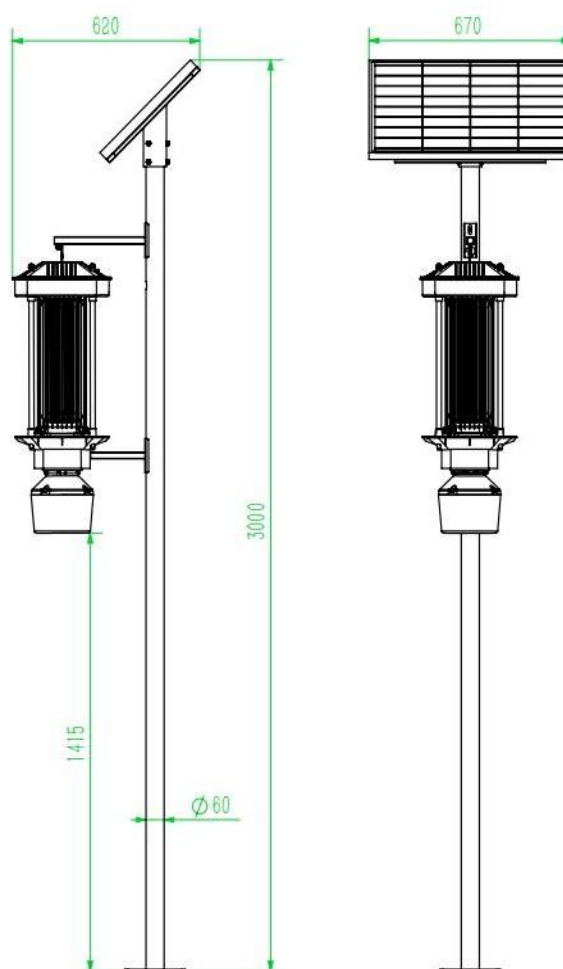
8. Adjust the product so that the solar panel is placed

with its longitudinal axis facing the north-south direction.

9. Based on actual conditions, promptly clean the insects attached to the high-voltage electroshock net and remove the pests from the collection box to ensure effective pest control.

10. Regularly wipe off the dust from the solar panel using a dry cloth to maintain optimal charging performance.

Product Size



Troubleshooting and Handling Methods

1. The insect control light does not work at night
 - Causes:
 1. Battery is dead
 2. The connection of the solar panel's plug wire is not properly installed
 3. Controller malfunction
 - Solutions:
 1. Use a multimeter to measure the battery voltage
 2. Reconnect the solar panel's four-core plug wire
 3. Contact customer service

2. In sunlight, the insect control light's solar panel voltage, current, and power are 0
 - Causes:
 1. The controller has not detected the solar panel's voltage
 2. Poor connection or incorrect polarity of the solar panel wires
 3. The solar panel is damaged
 4. The solar panel specification does not match the battery system
 - Solutions:
 1. Reconnect the solar panel's plug wire
 2. Open the solar panel's back cover to check the wiring, and use a multimeter to measure the solar panel's voltage.

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