



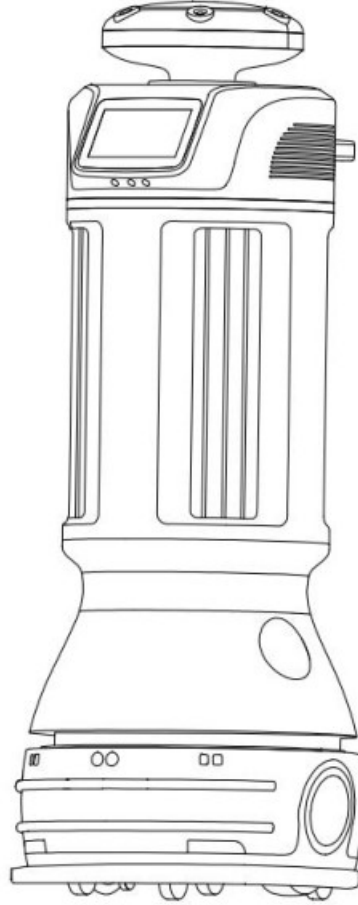
KEENON M2 Disinfection Robot User Manual

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KEENON M2 Disinfection Robot
User Manual

PEANUT M2 Disinfection Robot

User Manual



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Statement

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Without the written permission from Keenon Robotics Co., Ltd. Any companies or individuals are not allowed to copy, replicate, transcribe or translate the contents of the manual, whether in part or in whole, nor spread it in any ways (electronic, photocopying, and recording, etc.) for profit.

The product specifications and detailed information herein are for reference only. Content updates will not be notified. Unless otherwise specified, this manual is only for instruction. The statements made hereunder shall not constitute any form of warranty.

Preface

Dear users,

Thanks for choosing PEANUT Disinfection Robot. Before using, please read carefully this user guide and follow the instructions step by step. If there is any questions about this manual, please contact our customer hotline:086-400-9651-808.

Outline

This manual mainly demonstrates the functions and features of the robot, methods of installation and usage of the robot, and some precautions when using.

The manual mainly includes the following contents:

1. Introduction: a brief description on the basic function and characteristics of the robot.
2. Main Structure: a detailed introduction of the structure of the robot.
3. Operating procedures: an introduction on how to install and use the robot and some precautions when using.
4. Appendix: an explanation on common faults and detailed technical parameters of robot, and safety precautions.
5. Warranty: an a detailed introduction on the warranty time and some non-warranty clauses.

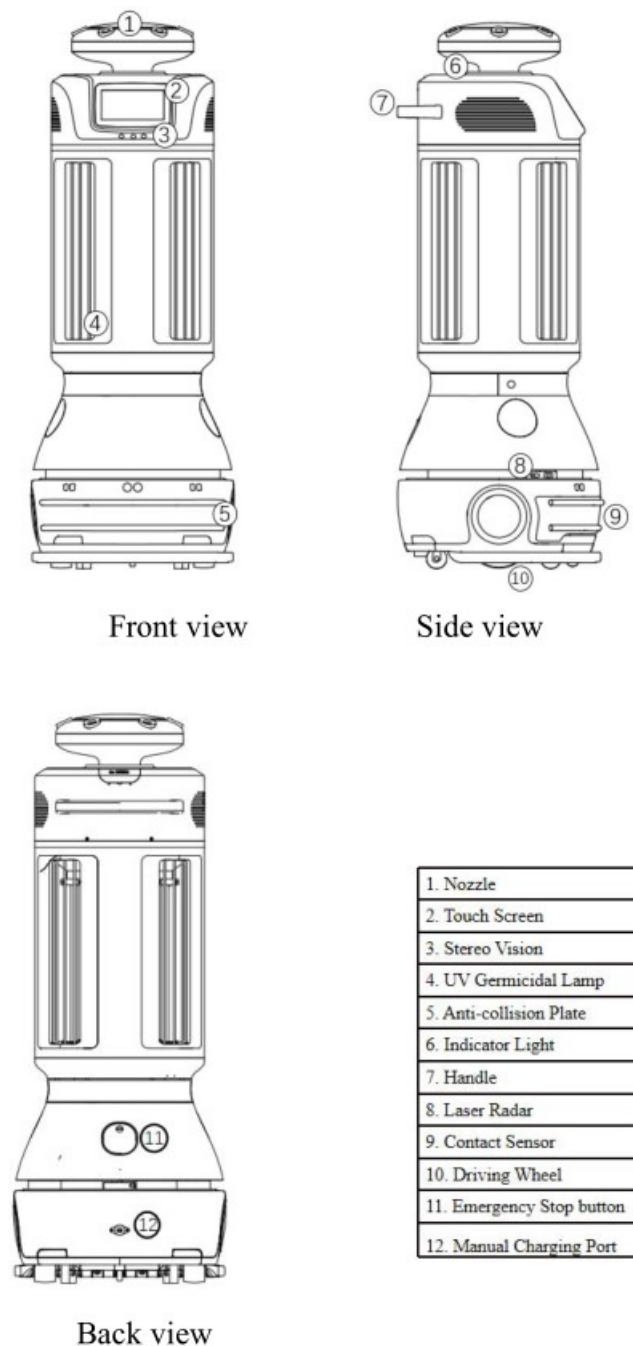


Fig. 1 Structure diagram of PEANUT Disinfection Robot

Note: The above figure is for reference only. Product appearance and color are subject to the actual product.

1. Introduction

- PEANUT Disinfection Robot is applied in public indoor occasions such as hospitals, quarantine areas, hotels, business offices, etc.
- PEANUT Disinfection Robot realizes fully autonomous positioning and navigation and intelligent obstacle avoidance through machine vision technology and radar, so it can move autonomously indoors.
- The product described herein is Disinfection Robot Model No. M2.

2. Main Structure

Fig. 1 shows the main structure diagram of PEANUT Disinfection Robot. The structure of the robot chassis is two-wheel drive and four-wheel driven. It achieves autonomous positioning through machine vision technology and radar and realizes intelligent obstacle avoidance by using some sensors such as touch switches. Users are able to operate the robot system in the touch screen monitor.

Fig. 2 shows the structure diagram of charging pile of PEANUT Disinfection Robot. The robot has the function of intelligent and autonomous recharging. It can autonomously find, match and contact the charging pile to realize automatic recharging.

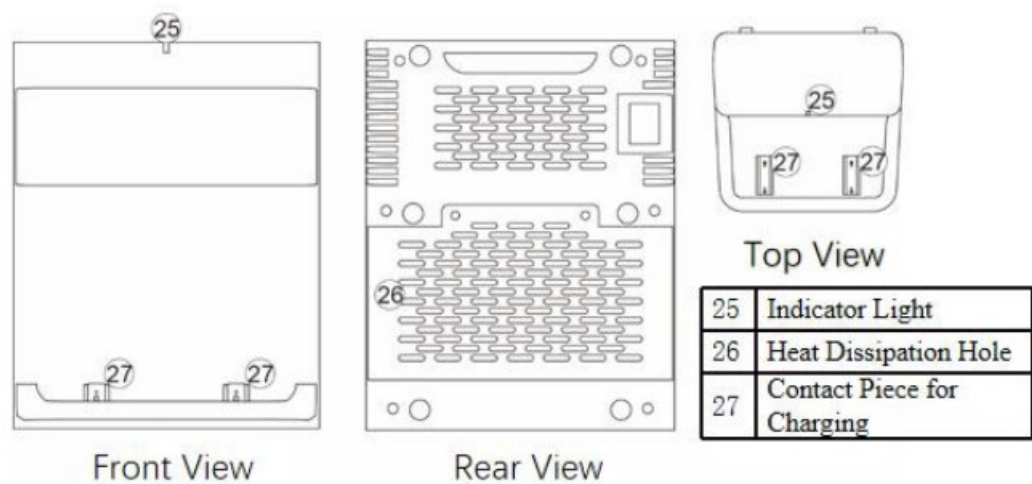


Fig. 2 Structure diagram of charging pile

Main bactericidal factor: Ultraviolet
Sterilization factor intensity: Radiation intensity at 1m away from the ultraviolet lamp>200μW/cm2. Sterilization principle: Ultraviolet rays destroy the molecular structure of DNA or RNA in the cells of microbes and cause the cells to die, thereby achieving the effect of sterilization and disinfection. Types of microorganisms to be killed: Staphylococcus albus, pores of Bacillus subtilis var. niger, natural bacteria in the air.

Executive standard: Q/QLZN 001-2020

3. Operating Procedures

Please follow the steps below to operate the robot.

3.1 Installation

3.1.1 Robot Mapping

Before putting robot into use, the robot needs to scan and record the path and environment first, then it can store and identify the path in the form of a map in its system. This is called mapping. (This will be completed by professional technical personnel)

When the environment was changed (such as redecorating and changing the structure of the building, moving the robot to another new environment, or rearranging positions of interior stuff), the map should be rebuilt.

3.2 Power On

3.2.1 Power Button

The power button is located on the lower surface of the gap in the laser layer (on the side of liquid injection port), as shown in Fig. 3. Pressing the power button by hands can turn on or off the robot. When you turn on the robot, it will take about 40s to start the system before operation. After you turn off the robot, the machine will be powered off immediately.

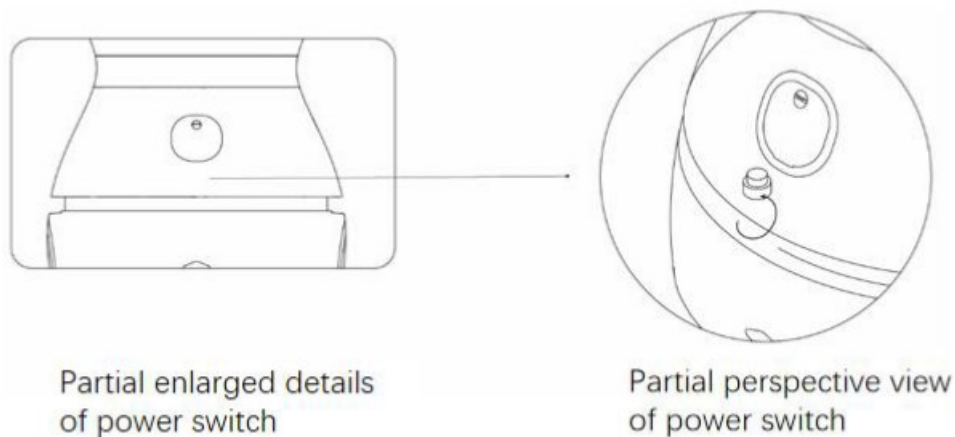


Fig. 3 Schematic diagram of power switch position

3.2.2 App Instructions

3.2.2.1 Introduction

The basic disinfection progress: Firstly, the user selects the disinfection mode in the APP. Secondly, the user selects the destination or the route in the APP. Thirdly, the robot departs to the destination. Fourthly, Upon arrival at the destination (or route area), the robot will send a voice prompt, and then conduct continuous disinfection task until it finishes the tasks set by the users; Lastly, The robot will return to the starting point automatically when it finishes the works.

3.2.2.2 Disinfection Mode

The robot has three disinfection modes:

- On-the-way mode: The robot conducts ultrasonic dry mist disinfection along the route.
- Fixed-point mode: The robot conducts ultraviolet disinfection for one single room.
- Dual mode: The robot conducts dual mode disinfection (ultraviolet disinfection and ultrasonic dry mist disinfection) at the same time in a room.

Under the on-the-way mode, the user can select one or several routes. Firstly, Press the button `Go` in the screen to start the robot; when the robot arrives to the starting point of the first route, it starts spraying for disinfection and continues this operation along the way back and forth. Meanwhile, the robot will send a voice prompt every 2 minutes until the disinfection process for pre-set number of cycles is completed. After that, the robot continues to spray on the next route or returns to the original point. This mode is always used when there are people around, which will not do any harm to people.

Under the fixed-point mode, the user may select one or more routes (maximum 4 routes for the current version). Firstly, Press on the button `Go` to start the robot; when reaching the destination, the robot will send a voice prompt. Then, it operates ultraviolet disinfection and sends a voice prompt every 2 minutes until the pre-set disinfection time is over. After that, the robot continues disinfection operation on the next point or returns to the original point. This mode is always used when there is no people around. Please keep away from the robot under the fixed-point mode to prevent damage caused by ultraviolet radiation.

Under the dual mode, the user may select one or more routes (maximum 4 routes for the current version). Firstly, Press on the button `Go` to start the robot; when reaching the destination, the robot will send a voice prompt. Then, it operates both ultraviolet and spraying disinfection while sending a voice prompt every 2 minutes until the pre-set disinfection time is over. After that, the robot continues disinfection on the next point or returns to the original point. Please keep away from the robot under the dual mode to prevent damage caused by ultraviolet radiation.

In the disinfection process, each mode supports the functions of suspending disinfection and ending tasks, and the interface of the robot displays the remaining disinfection time or disinfection mileage. Upon completion of each disinfection task, the main interface will update to display the operation statistics this day, such as cumulative disinfection time, cumulative disinfection mileage and cumulative task volume.

Warning:

1. When using disinfectant, please follow relevant regulations and pay attention to safety;;
2. Ultraviolet radiation should be used in unmanned state to prevent harm to people;

3.2.2.3 Settings

Press the `Settings` button at the top left of the main page and enter the 4-digit password to enter the setting page.

Users can set the number of cycles for spraying disinfection, duration of stay at destination, Spray intensity, sound volume, new password, robot unlock switch during pause, working time, instant charging, and so son.

Among these settings, the number of cycles for spraying disinfection: It refers to the number of cycles for spraying disinfection by the robot on the given route, which is only available under onthe-way mode. Users can set 1-5 times, or unlimited times.

Spray intensity: refers to the speed of spraying under the on-the-way mode and dual mode. Duration of stay at destination: refers to the ultraviolet irradiation time (15min 90min) under the fixed-point mode and dual mode. Robot unlock switch during pause: if this setting is turned off, the user clicks on the screen, and the robot will be locked when the robot pauses, then the user cannot push the robot to move manually.

The function of automatically closing ultraviolet rays when people around: this function can be turned on or off by button; when the function is turned on, when the robot detects that someone is approaching within 2 meters in front of the robot in the process of ultraviolet disinfection, it will automatically turn off the ultraviolet ray, so as to prevent injury to personnel.

3.3 Charging

3.3.1 Autonomous Intelligent Recharge

The robot has the function of intelligent autonomous recharge. The robot will return to the charging pile to recharge if below two conditions are met. Besides, please ensure that the charging pile is secured in position and plugged.

- The battery power of the robot is lower than the recharge amount set by the user.
- The robot is not disinfecting and its battery power has not reached 100%.

3.3.2 Adapter Charging

(Don't operating the robot while the adapter is charging.)

Please follow below steps to charge the robot through the adapter:

1. Power off the robot.
2. Open the silicone sleeve outside the charging jack in the back of the robot and use the charging plug of the adapter to connect to the robot.
3. After successful connection, the adapter indicator will turn red (if the indicator light is yellow, please press the indicator light, then the indicator light will turn red).
4. The charging is complete when the adapter indicator light turns yellow. Then, please disconnect the adapter and plug the silicone sleeve outside the charging jack of the robot.

3.4 Filling Disinfectant

When the robot prompts that the disinfectant level is too low, the disinfectant needs to be added manually. The filling port is located on the rear side of the body, as shown in Fig. 4. Please lift up the silicone cover and pull out the inner gray silicone plug to add disinfectant.

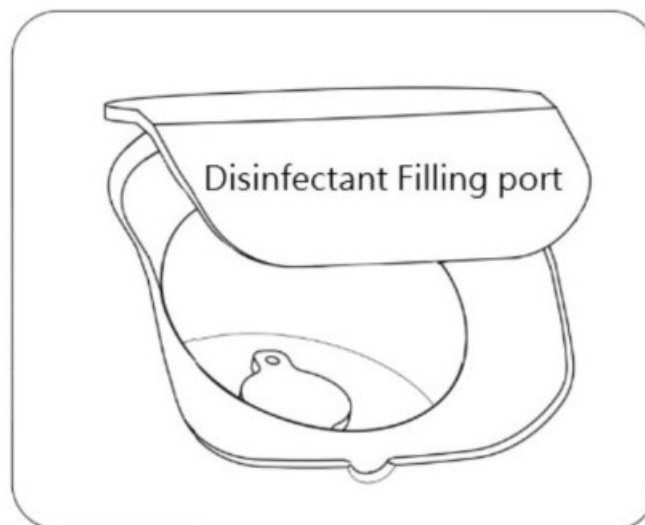


Fig. 4 Disinfectant filling port

3.5 Disinfectant Discharging

When you have to discharge the disinfectant in the robot, firstly, please pull out the gray silicone plug on the top of

the robot(DO NOT destroy the plug), as shown in Figure 5; then insert the end of the hose of the pump into the head of the robot, and put the other end of the pump in the container to catch the disinfectant; finally press the switch button on the top of the pump to start the discharging. Please note: The robot can be turned on during this proceed. When the indicator light is orange, it means that the disinfectant has been emptied. After the discharging is complete, please put the silicone cover back on the top of the robot.

Attention: DO NOT spill disinfectant on any part of the robot!

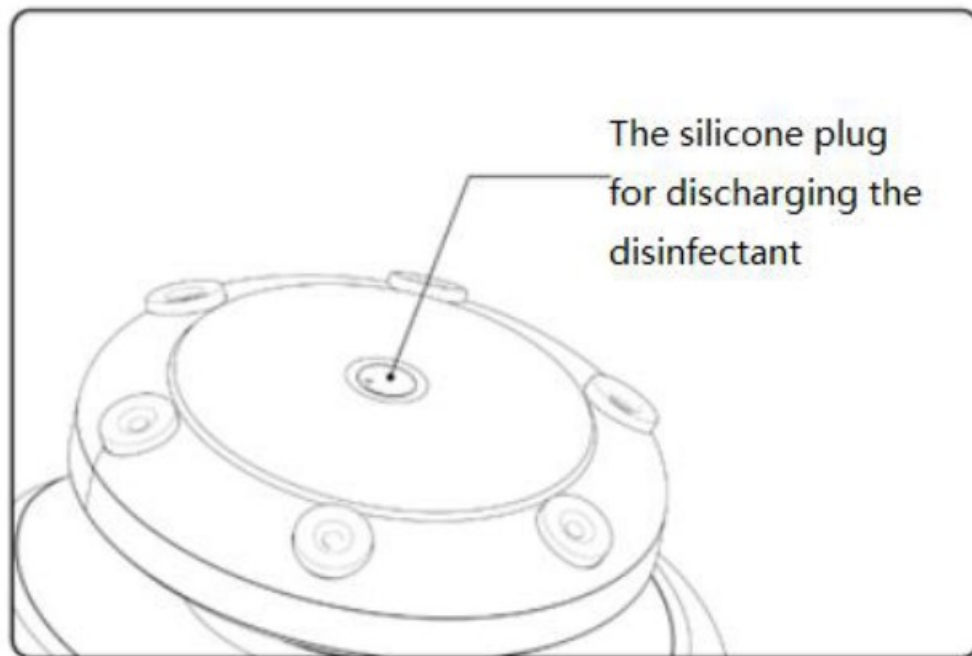


Fig .5 Top Silicone plug for discharging the disinfectant

3.6 Indicator Light

Indicator light status	Meaning
Blue breathing light (slow blinking)	The robot is in standby status, and neither the spray device nor the ultraviolet lamps are turned on.
Blue run light (rotating)	The robot is in operation, with spraying device or ultraviolet lamp on.
Blue warning light (fast blinking)	Warning, ultraviolet lamp will be turned on soon.
Orange breathing light (slow blinking)	The robot is lack of disinfectant. Please fill in disinfectant, or the spraying device cannot work.

3.7 Emergency Treatment

The user can stop the robot by pressing the red emergency stop button on the top of the robot if there is any emergency, e.g. when the robot is in motion, the user needs to move the robot by hand; or the robot is in an abnormal operation status, which may cause damage to the surrounding environment etc. For the location and

operation steps of the emergency stop button, please check Figure 6 below.

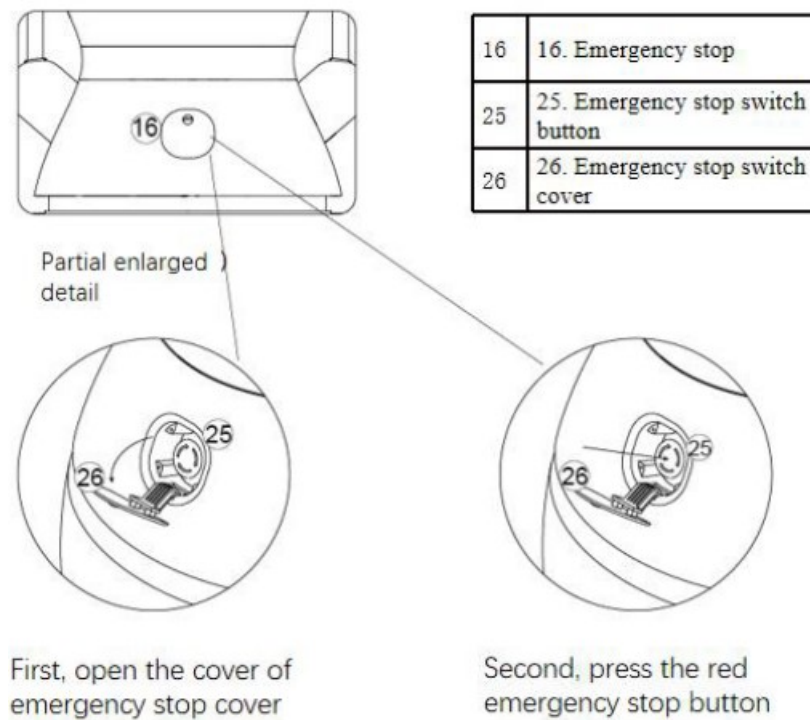


Fig. 6 The emergency stop button

The emergency stop button of the robot is on the back of the robot, which is the position shown by the number 16 in the figure. To activate the emergency stop switch, firstly you need to open the outer cover of the emergency stop switch, and then destroy the acrylic protection plate in the middle layer, and finally press the red emergency stop switch to stop the robot in an emergency.

* **Note:** Activating the emergency stop switch will destroy the acrylic protection plate, so do not activate the emergency stop switch in non-emergency situations.

3.7.1 Moving Robot Manually

Robots are expensive equipment. Please strictly follow the instructions below when moving robots manually.

As shown in Fig. 7, the upper part of the gap of the laser layer (the surface indicated by the arrow) is the force-bearing part, through which you can lift the robot. Please hold the upper part of the gap of the laser layer with your hands when moving. Please always keep the robot upright during transport.

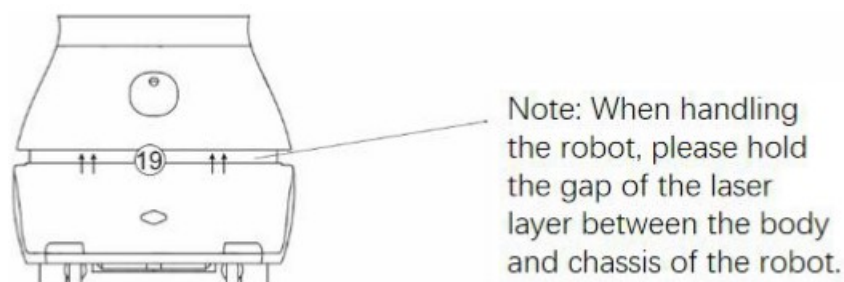


Fig. 7 Schematic diagram for moving the robot

* **Note:** The gap of the laser layer is the only force-bearing part of the robot to be handled. When moving robots,

you should strictly follow the instructions. It is strictly prohibited to directly pull and lift the bottom of the robot, turn over the robots, or directly lift the robot's face and head. The damage to the robot caused by improper operation during handling shall be borne by the user.

4. Troubleshooting and Parameters of the Robot

4.1 List of Exception and Troubleshooting

Failure Description	Possible Causes and Solutions to the Problems
The robot cannot be turned on normally.	<ol style="list-style-type: none">1. The battery of the robot is low, please charge the robot through the adapter.2. For other causes, please contact the seller.
The robot cannot be charged normally.	<ol style="list-style-type: none">1. Please press the yellow indicator light of the adapter, then the indicator will turn red.2. For other causes, please contact the seller.

The robot cannot move and navigate.	<ol style="list-style-type: none"> 1. The robot is in the blind area of the map, please turn off the robot and push it to the vicinity of the starting point to start navigation again. 2. The top camera, stereo vision or the gap of the laser layer is covered; please ensure that the above modules are not covered. 3. The robot's radar is malfunctioning, please check whether the radar is rotating normally. 4. The collision switch of the robot is malfunctioning, please check whether the collision switch is squeezed. 5. For other causes, please contact the seller.
The robot cannot broadcast by voice.	<ol style="list-style-type: none"> 1. The voice function of the robot is turned off or the volume is too low; please reset the voice. 2. For other causes, please contact customer service personnel.
The robot moves abnormally.	Please turn off the power of the robot immediately and contact the seller.
The robot falls.	Please turn off the power of the robot immediately and contact the seller.

4.2 Performance and Parameters of the Robot

Model	Disinfection Robot No. M2
Dimension	500*500*1350 mm
Disinfectant volume	15L
Spraying Parameter	Spraying output: 0.5-1.5L/h; Spray particle size < 10μm.
Number of ultrasonic atomization devices	6 sets of ultra-dry atomizing nozzles
Applicable disinfectant	Hydrogen peroxide, hypochlorous acid, and peroxyacetic acid
Ultraviolet radiation intensity	>200μW/cm ² (at 1 meter)
Number of ultraviolet lamps	Four sets of UV germicidal lamp, with 360° surround radiation
Disinfection method (Three methods for choice)	Ultrasonic dry mist disinfection
	Ultraviolet irradiation disinfection
	Ultrasonic dry mist disinfection + Ultraviolet irradiation disinfection
N.W.	60Kg

Moving speed	0-0.8m/s
Maximum climbing angle	Slope $\leq 3^{\circ}$
Network interface	WIFI
Battery capacity	DC 48V 15Ah
Rated power	150W
Standby current	Standby current is less than 0.5A
Endurance time	about 4 hours
Standby time	Standby time is greater than 24 hours
Life span	20,000 h
Temperature and humidity for operation	0-45°C, RH: 5%-85%, no dust
Operation environment	Indoor environment, flat and smooth ground
Charging mode	Automatic/manual charging
Input voltage	Input rated voltage for charging port and adapter:100-240Va.c/50-60Hz
Storage temperature	0°C -60°C

4.3 Safety Instructions

4.3.1 Use Restrictions

- (1) As a wheeled robot, the product shall only operate in indoor environment with flat ground (smooth ground; slope: 3° ; protrusion height: 0.5cm). Do not operate the robot in outdoor environment (such as open balcony) or rugged ground (such as stairs).
- (2) Do not operate the robot in a suspended environment (e.g. duplex floor, open balcony, top of house, stairs) or environment without protective fence.
- (3) Do not operate the robot in an environment where the temperature is higher than 45 or lower than 0 or there is liquid or viscous substance on the ground. The disinfectant should meet the standard GB57492006.
- (4) Before using the robot, please remove all kinds of wires on the ground in the operating environment to avoid dragging when the robot is in operation.
- (5) Before using the robot, please remove sharp objects on the ground (such as decoration waste, glass, nails, etc.) to avoid damage to the chassis of the robot.

- (6) Do not put anything on the host of the robot not matter when it is still or moving.
- (7) Do not push or move the robot manually while the machine is moving.
- (8) Do not clean and maintain the host of the robot and charging pile unless the robot is shutdown or powered off.
- (9) Do not use the harden or sharp objects to collide with the robot.
- (10) Do not spill any liquid into the robot.
- (11) The robot must be kept upright, non-tilting.
- (12) The robot is an electronic product. Please keep it away from fire.
- (13) Before transport the product, please discharge disinfectant first, and ensure that the host of the robot is powered off. It is recommended to use the original packaging box for packaging.
- (14) As the disinfectant is a chemical medicine, please strictly abide by the disinfectant usage specification when using the disinfectant atomization method for disinfection. In case of damage caused by improper use of disinfectant, all responsibilities shall be borne by the users themselves and have nothing to do with our company.
- (15) Ultraviolet radiation has certain harm to the human body. When using ultraviolet radiation for disinfection, it should be operated in an unmanned environment. If the damage is caused by improper operation, all responsibilities shall be borne by the users themselves and have nothing to do with the company.

Please use this product according to the instructions in the user manual. Any loss or injury caused by improper use shall be borne by the user.

4.3.2 Battery and Charging

- 1. Do not use any battery or power adapter from the third party.
- 2. Do not disassemble, repair or refit batteries or charging pile without permission.
- 3. Do not place the charging pile near the heat devices (such as radiator, etc.).
- 4. Do not wipe or clean the charging pile contact piece with wet cloth or wet hands.
- 5. Do not throw away the discarded batteries at will. It is recommended to be handled by professional organization.

If the robot is idle for a long time, please turn off the host upon full charge and put it in a cool and dry place. It's better to charge the robot once a month to prolong battery life.

5. Warranty and After-Sales Service

5.1 Warranty

With regular inspection and maintenance, the expected service life of the product is 5 years and the warranty period is 1 year.

If the product fails in the warranty period due to quality or manufacturing issues of original components, maintenance will be provided free of charge.

The warranty period is 1 (one) year from the date of purchase of the equipment.

5.2 Non-Warranty Clause

The warranty is only applicable to the products under normal use. Products damaged by users and the following clauses are not covered by our warranty.

1. Product damage caused by negligence, fault and misuse of users, or disaster (e.g. food liquid stains, water seepage, external force cracking, scratches and damage of peripheral components, etc.).
2. Users dismantle the machine by themselves, and repair and refit it without authorization and approval of the manufacturer.
3. Improper connection of accessories; product damage caused by transportation and other accidents.
4. Damage caused by force majeure.
5. Vulnerable and consumable parts are not covered by the warranty.

5.3 Warranty Card

If a problem persists despite measures described in 4.1, please contact us for maintenance and repair services. Please provide the following product information:

Product information	Product model:	SN code:
User information	Name:	Date of purchase:
	Tel.:	Email:
	Address:	Purchase address:
Sales unit information	Distributor:	
		Stamp of distributor

5.4 After-Sales Service

We provides comprehensive pre- and after-sales services including installation, commissioning (deployment), training, maintenance and repair. The product has a one-year warranty period.

Maintenance services and free technical consulting and software upgrade services will be provided throughout the service life of the product.

Our customer service response time is maximum of 48 hours

Appendix

Thank you for choosing the PEANUT M2 Disinfection Robot. We will provide you with quality and efficient services.

This manual is a detailed document to guide the installation, operation and maintenance of this product.

Please read the instructions carefully before installation and using the product for the first time.

Directions for Use and Management:

- 1. This product must be handled by professional medical personnel, or trained equipment managers or operators.
- 2. This product must be used in the prescribed scenarios.
- 3. Please properly dispose the product packaging and components in accordance with the local waste disposal regulations.
- 4. Please do not improperly dispose disinfectant and its packaging. Please refer to the precautions for the use of a disinfectant.
- 5. This product must be charged only by the accompanying charging pile.
- 6. Please only use the emergency charging cable for an emergency charge.
- 7. Do not attempt to open the equipment housing by unauthorized personnel.
- 8. This manual provides information related to the product. All contents in the manual are subject to change without notice, including printing errors, inaccurate information, or improvements to software and equipment. Nevertheless, all such alterations will be included in the latest version of this manual.
- 9. This document is an accompanying document of the equipment. Please properly keep it for reference.
- 10. If you find any problems or uncertainties during use, please feel free to contact the manufacturer or distributor promptly.

Documents / Resources

<div><div>PEANUT M2 Disinfection Robot</div><div>User Manual</div><div></div></div>	<div>KEENON M2 Disinfection Robot [pdf] User Manual</div> <div>M2 Disinfection Robot, M2, Disinfection Robot</div>
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