

**Chuangze brand CZ-RobotDf-DZ autonomous  
mobile  
Intelligent Disinfection Robot**

User manual

Chuang Ze Intelligent Robot Group Co., Ltd



## Chuang Ze Intelligent Robot Group Co., Ltd

### Product Description

Before using this product, be sure to read this product specification carefully.

Please take good care of the book so that it can be consulted at any time in the future.

Please use it correctly on the basis of full understanding of the content.

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# Introduction

Thank you for using Chuangze CZ-RobotDf-DZ autonomous mobile intelligent disinfection robot. Chuangze Intelligent Robot Group Co., Ltd. will provide you with high quality and efficient service.

This specification is to guide the product installation, operation, detailed description of the document.

For the first time, read the instructions carefully before installation.

## **Use and management considerations:**

This product must operate and run in the specified usage scenario.

- 1) Do not arbitrarily discard the outer packaging of products and related parts, please follow the local waste disposal regulations;
- 2) Do not arbitrarily discard the product matching use and its outer packaging;
- 3) Disassembly of equipment by persons not authorized by the Company is prohibited;
- 4) This information belongs to the equipment random document, please keep properly, uses;
- 5) If any problems or ambiguities are found during use, please contact customer service telephone in time.

## **Version Statement:**

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## Chapter I Overview

### I. Product description

#### Product name

Chuangze brand CZ-RobotDf-DZ independent mobile intelligent disinfection robot.

#### Product description

Chuangze brand CZ-RobotDf-DZ autonomous mobile intelligent disinfection robot, hereinafter referred to as disinfection robot. The disinfection robot has self-navigation

technology and can move independently according to the set route to meet the needs of automatic, timing and accurate disinfection in the indoor environment with more rooms or duplicate layout. It can realize multi-mode intelligent disinfection such as plasma disinfection and ultraviolet disinfection, and is equipped with "man-machine coexistence" and "unmanned disinfection" two disinfection modes, which makes disinfection more humanized.

## Scope and Use of Products

This standard is suitable for ultraviolet plasma disinfection robot which is composed of ultraviolet sterilization lamp, filter device, fan and plasma generator. It is suitable for rapid disinfection of indoor air and object surface.

## II. Main functions and characteristics

1. equipped with laser navigation module, it can realize autonomous walking and automatic obstacle avoidance, and at the same time, it can realize automatic charging function and reduce the working intensity of staff;
2. can realize multi-mode intelligent disinfection, such as plasma disinfection and ultraviolet disinfection, with "man-machine coexistence" and "unmanned disinfection" two disinfection modes, make disinfection more humanized;
3. can be implemented remotely, the top of the robot is equipped with a wide angle camera, which can realize the remote operation in various complex environments, reduce the contact of personnel, and effectively reduce the risk of infection. Its equipped with human induction device, can real-time perception of the activities of the surrounding personnel, when there are personnel into the ultraviolet disinfection range, can intelligently achieve the closure of ultraviolet lights, to protect the safety of the surrounding personnel, better service to the user group;
4. can achieve multi-mode disinfection, a disinfection robot can complete a variety of disinfection methods at the same time, disinfection robot can provide timing, fixed area, fixed task three modes of operation; can achieve 360° in the disinfection range without dead angle coverage, at the same time, has a long time to work, compared with a single and poor standard manual disinfection, disinfection robot can avoid cross-infection, but also save a lot of labor costs;

### III. Schematic illustration of the structure of the disinfection robot

#### 1 Robot Face-to-face Diagram

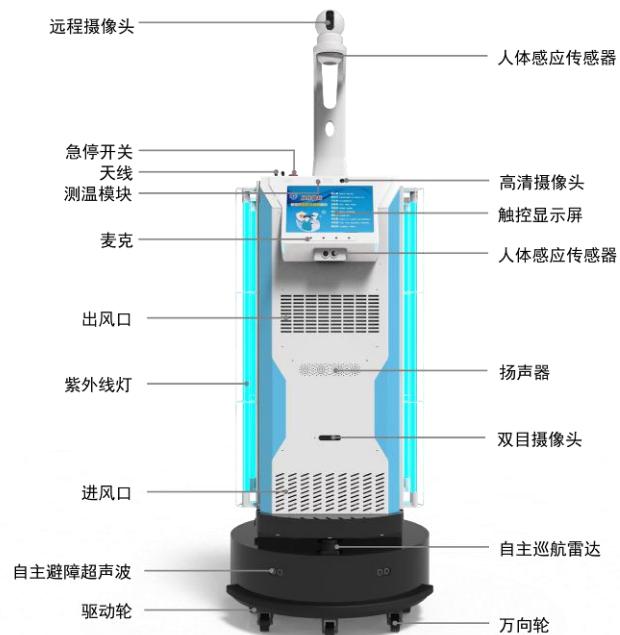


Figure 1

## 2 Robot Back View

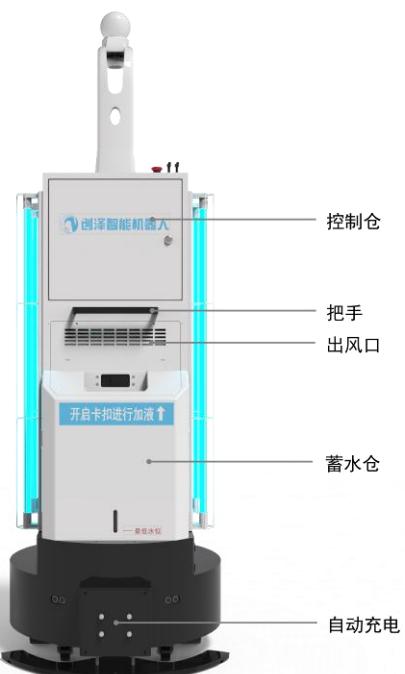


Figure 2

### 3 Robot Side View Diagram



Figure 3

## IV. Working principles

For the daily disinfection task, the disinfection mode, time and place can be set up through the background operation. After the robot receives the task, it independently plans the path to the designated place and carries on the disinfection work according to the set mode. After the disinfection task is completed, the robot returns to the charging point for automatic charging. The robot can realize multi-mode intelligent disinfection such as plasma disinfection, ultraviolet

disinfection and so on. It is equipped with two disinfection modes :" man-machine coexistence "and" unmanned disinfection ". When someone enters the ultraviolet disinfection range, it can intelligently turn off the ultraviolet lamp, protect the safety of the surrounding personnel and better serve the user group.

## V. Main bactericidal factors and their intensity

Main bactericidal factors	Microbial killing	Object of action
UV	natural bacteria, Escherichia coli, Staphylococcus aureus, Candida albicans, Klebsiella pneumoniae, Staphylococcus albicans, Pseudomonas aeruginosa.	Indoor air, object surface.
Plasma	natural bacteria, staphylococcus albicans.	Indoor air.

## VI. Key performance

### 1. plasma disinfection

Circulating air volume	$m^3/h \geq 600$
Noise	$\leq 60 \text{ dB}$
Ozone leakage rate	$\leq \text{mg } /m^3 0.1$

### 2. disinfection environment

Relative humidity in working environment	RH 20 RH~80 per cent
Working ambient temperature	5°C~60°C

### 3. Disinfection Effect

Ultraviolet disinfection can kill 99.9% in 30 m<sup>3</sup> space for 15 minutes, while plasma air purification can satisfy air sterilization and air purification in "man-machine coexistence" mode, and reach 99.9% sterilization rate.

### 4. Electrical Safety and Requirements for Use

The safety of product design, production, charging and operation shall meet the standard requirements of the GB/T 15706-2012、GB/T 16855.1-2008、GB 5226.1-2008、GB 4943.1-2011 separately, and the use, transportation and storage of ultraviolet disinfection lamps shall meet the standard requirements of A.3.1.2 of the disinfection technical specification for GB 19258-2012、WS/T 367 medical institutions, and the electrical safety of the equipment shall meet the GB9706.1-2007 requirements.

## VII. Technical performance indicators

Content	Parameters
Dimensions	620 x 670x 1390/1960(mm)
Weight	120 kg±2 kg

Appearance	Anti-corrosion metal +ABS
Material	
Appearance	White + black
Color	
Control mode	Voice/ APP/ fuselage screen touch/computer terminal control
Operating system	Android 7.1 above
Main controller	RK3399 or higher performance platforms
Storage configuration	Memory ≥2 G, Storage ≥16 G
Screen parameters	10.1 inches / aspect ratio 16:10/ resolution 1280×800
Battery parameters	Lithium batteries ;60 AH ≥ capacity
Standby time	≥30 hours
Working hours (full function)	≥5 hours
Charge time	Full charge ≤6 hours (under standard charger)
Rated power	360W
Speed of movement	supports 0-1 m/s moving speed ,3-speed adjustable

Type of voice acquisition	Remote Voice Acquisition
Number of Macs	4 Mike Matrix
Chassis structure	6-wheel structure/intermediate drive, back and forth follower
Number of ultrasonic sensors	≥6
Camera	2 million pixels
Disinfection methods	WIFI
Plasma circulating air volume	600 m <sup>3</sup> / hours
UV intensity	135μW/cm <sup>2</sup> x 4
Disinfection efficiency	Plasma sterilization rate :>99.9 per cent
	UV sterilization rate :>99.9 per cent

## Chapter II Installation

The engineer of our company (or designated dealer) shall install, debug (deploy) according to the requirements of the installation and deployment specification of disinfection robot system). Refer to open box and inspection steps before installation.

# Chapter III Basic Operation of Disinfection Robot

## I. Disinfection Robot Switchgear

The power switch of the robot is located at the bottom of the side of the robot, and the "power switch" position marked in the specific position (refer to figure 4). Boot time takes about 30 seconds, when the robot program is started, the robot completes the boot operation. Shutdown operation and the above operation is basically similar.

Note that do not switch the machine frequently in use, so as not to cause internal damage to the robot, need to wait for the robot to turn on or shut down after the subsequent operation.



Figure 4

The robot chest screen lights up after the robot is turned on (see figure 5).



Figure 5

## Disinfection Robot Stop

Stop button is when an emergency can be quickly pressed to achieve protection.

When the stop button is pressed, the "P" picture" in the upper right corner of the robot interface lights up (see figure 6), and the robot will stop moving, and if the robot continues to move, it must be lifted.



Figure 6

Note: if the robot turns on the emergency stop switch robot will not be able to sterilize, the user needs to remove the emergency stop button. Release from emergency (see Figure 7):

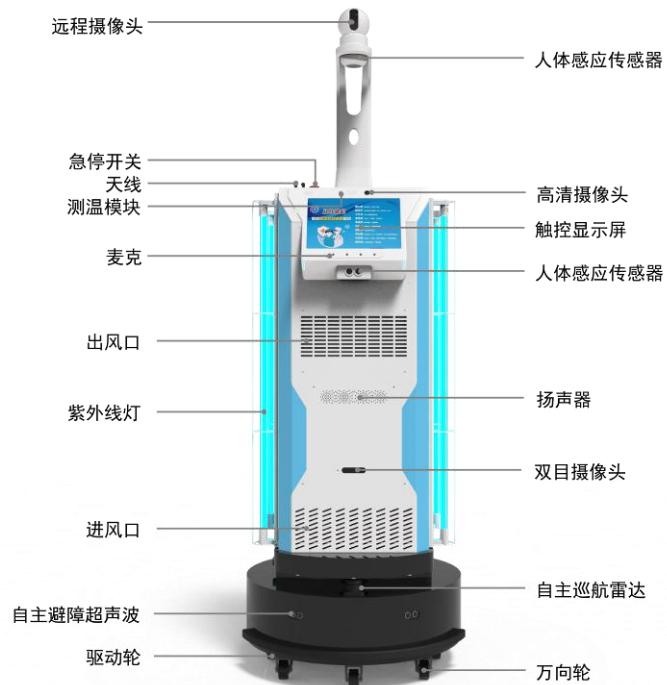


Figure 7

### III. navigation status

#### 1. Check navigation status

Navigation states are divided into two types :1 connected navigation (see figure 8 )

and 2 disconnected navigation (see figure 9)



Figure 8



Figure 9

## IV. New tasks for disinfection robots

Disinfection robot disinfection mode: ultraviolet disinfection + plasma disinfection;

Disinfection mode:

- ① Click on the robot screen to create a new task, jump task interface (see figure 10);



Figure 10

- ② Select the disinfection site (see Figure 11);



Figure 11

- ③ Users can also modify the disinfection site, click on the replacement location to modify (see figure 12);



Figure 12

Select disinfection type: plasma / ultraviolet, pop up plasma / ultraviolet setting interface (refer to figure 13), set disinfection time: for example ,10 minutes, set disinfection mode: for example, fixed point disinfection, the front detected whether the person continues to perform, click next;



Figure 13

Task start time according to user selection: immediately disinfection / timing disinfection, if the selection of timing tasks need to be timing disinfection settings (see figure 14);



Figure 14

The next step is to save the task name interface, such as ultraviolet outpatient disinfection (see figure 15);



Figure 15

7 New disinfection tasks can be presented in the main interface (see Figure 16)



Figure 16

## V. Disinfection status of disinfection robots

Click on the beginning of the common tasks of the robot, pop up whether to execute the task interface (refer to figure 17) click "execute" to execute the task;



Figure 17

The robot interface presents a "Do not disturb status while performing tasks "(see Figure 18)



Figure 18

## VI. STOP DESTINATION BOTH

The robot performs the task interface with pause and stop tasks, and the user can choose (see figure 19).



Figure 19

## VII. List of disinfection robot tasks

The task list is to view all disinfection tasks of the current robot. The user views the specific contents of the task according to his own choice, and chooses to execute or delete the task (see figure 20).



Figure 20

## VIII. Historical records of disinfection robots

Click on the history in the main interface to view all the tasks performed by the current robot (see figure 21).



Figure 21

If the user wants to see the specific content, you can choose to click on the task, for example: click to view 101 ultraviolet disinfection task specific information (see figure 22).



Figure 22

## IX. STATUS MONITORING OF THE STEVENING Robotics

Users can click on the status monitoring in the home screen to view the current robot status data (see figure 23).



Figure 23

## X. Charging

Robot charging: the user can charge by waking up the robot and observing the power on the screen (see figure 24). The robot is charged.



Figure 24

When charging, please open the front end of the charging port dust shield. Insert one end of the adapter plug into the robot charging port (see figure 25), and then plug the power cord plug into v 220 power outlet.



Figure 25

## XI. STEVENING Robotics

Mobile robot: when the robot is not needed, please manually push the robot to the position point after turning off the machine.

Note: forced push will lead to the robot can not operate normally, boot state prohibited.

## XII. Map initialization

Note: if the robot is artificially moved in the state of shutdown, such as the robot is pushed back to the charging point when shutdown, initialization must be performed. Normally the switch machine does not need to start initialization.

## (1) Initialization

There are two ways to initialize a map:

When the robot has just started, if the boot position is not set, the robot will be prompted to initialize operation (see Figure 26), click the "Go Set" button to enter the map editing interface.



Figure 26

2 In the main interface of the robot, double-click the Logo area in the upper left corner, enter the settings interface (see Figure 27), click on the map option, or enter the map editing interface.



Figure 27

## (2) Criteria for map matching

The standard of map matching is to determine whether the current map position is matched with the laser data. (Refer to Figure 28) The red laser beam is completely coincident with the boundary of the map, which indicates that the map is matched and no further initialization is required.

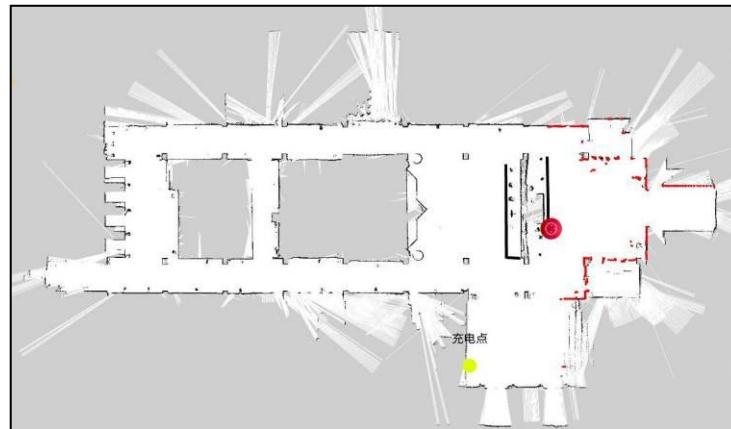


Figure 28

Figure 29 shows that the red laser beam does not coincide with the map boundary, so the map must be initialized in this case.

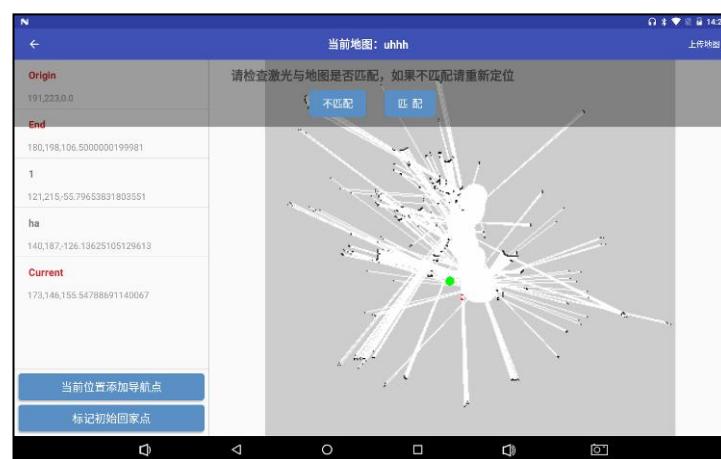


Figure 29

### (3) Initiate initialization

When the robot map needs to be initialized, in the map editing interface, click the "mismatch" button to enter the map editing interface.

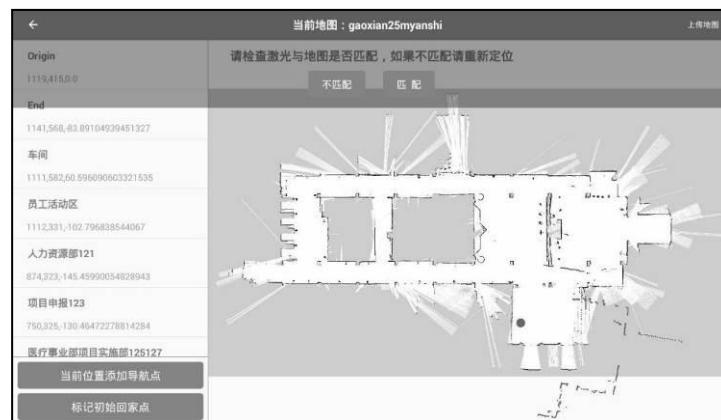


Figure 30

After entering the map editing interface, we need to drag the map base map to make the map position of the robot match the actual position (see figure 31).

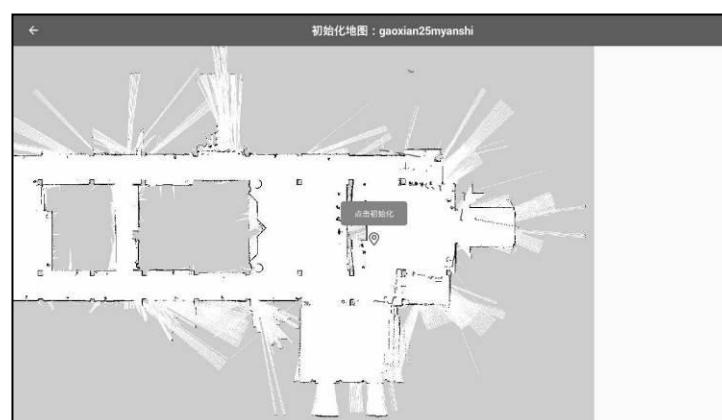


Figure 31



After the position is determined, click the "click initialization" button on the interface to initialize the operation. At this time, the robot will determine its position by turning. Please make sure that the robot stop button is not pressed when turning. Otherwise, the robot will not be able to complete the initialization operation.

#### (4) Determination of map matching

After the robot turns, it is necessary to check whether the map has been matched at the robot end. If there is no match, the initialization operation above needs to be repeated until the map matches.

# Chapter 4: The Use of Routine Disinfection Robot

## I. Processes and Steps for the Daily Use of Robots

- Push the robot to the starting point;
- Click on the power switch to turn on the robot;
- After the robot opens, wake up the robot and say to the robot "Hello creation ";
- After the robot wakes up, select the task in the screen and click the "execute" button;
- The robot starts executing the planned disinfection path;
- After the robot completes the disinfection, the task is over, if the disinfection state is interrupted halfway, click on the robot screen "end the task ", button robot back to the boot point;
- Press the power switch to turn off the robot.

# Chapter V Packaging, Transportation and Storage

## I. PACKING

Each product is packed in plastic bags and packed in wooden boxes with foam between plastic bags and wooden boxes.

## II. Transport

Transportation is required by the order contract.

## III. Storage

The sterilizing machine after packing should be stored in a room with relative humidity of not more than 80%, non-corrosive gas and well ventilated, cool and clean.

# Chapter VI Attention to Disinfection Robot

## I. Matters needing attention in charging power supply

Always keep 1. charger dry when stored and used;

2. as far as possible in the electricity 20-30% charge, the electricity can reach 90% robot can work, the purpose is to the battery can play a safe maintenance and protection role;

3. please use the charger equipped by the robot to charge, the charger is forbidden to replace with other chargers, the replacement will cause serious damage to the machine.

## II. Precautions for daily use

1. do not boot state and operating state forced push the robot, forced push will lead to the robot can not run properly;

2. the shutdown state can be implemented robot move to other places, but not too fast, slow push;

3. in order to ensure that the robot can be used normally, please ensure that the robot boot position is the boot point;

4. the robot in the process of operation, please remove the robot to pass through the obstacles in the route, especially stainless steel pipe twigs,



transparent items, items below 20 cm height;

5. the robot in the use of the relevant personnel, must know the emergency stop switch position and switch use;

6. disinfect indoor air with ultraviolet lamp. The room should be kept clean and dry, reduce dust and water mist, temperature below 20°C or above 40°C, relative humidity greater than 60 should be appropriate to extend the irradiation time.

Disinfection of 7. robot is recommended with 75% alcohol, wipe 3 times in shutdown state, can not spray directly.

8. must not make ultraviolet light source to the human body, lest cause damage.

9. because ultraviolet disinfection and plasma disinfection will produce trace ozone, it is recommended that the environment should be ventilated after long time disinfection.

## FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions :

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could



void the user's authority to operate the equipment.

NOTE : This equipment has been tested and found to comply with the limits for a Class B digital device,pursuant to part 15of the FCC Rules.These limits are designed to provide reasonable protection against harmful interference in a residential installation.This equipment generates uses and can radiate radio frequency energy and,if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.However, there is no guarantee that interference will not occur in a particular installation.If this equipment does cause harmful interference to radio or television reception,which can be determined by turning the equipment off and on,the user is encouraged to try to correct the interference by one or more of the following measures :

Reorient or relocate the receiving antenna. of the

Reorient or relocate the receiving antenna. of the

Reorient or relocate the receiving antenna. of the

Consult the dealer or an experienced radio/TV technician for help important announcement

Important Note : of the

## **Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.