SLAMTEC Mercury H2 Delivery Robots for Hotels User Manual

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SLAMTEC Mercury H2 Delivery Robots for Hotels

Introduction

Overview

H2 delivery robot for hotels is a commercial smart delivery robot developed by Shanghai Slamtec Co., Ltd. It is designed to empower the intelligent transformation of hotels and business buildings by replacing manual labor with machines to reduce operation costs and improve service efficiency. This product supports order placement via cell phone and provides functions such as cloud platform unified management, real-time response, and autonomous delivery. Through autonomous smart operations and data-driven optimized management, we deliver brand differentiation for hotels and commercial buildings, enhancing corporate competitiveness. Autonomous smart operations Mercury H2 smart delivery robot responds to the delivery needs of users in hotels and business buildings in real time. It provides intelligent, targeted delivery for customers through SLAM automatic mapping, autonomous path-finding, smart elevator control, safe moving, pickup notification, and autonomous recharging. Data-driven optimized management Mercury H2 smart cloud management platform enables real-time monitoring of robot devices. Leveraging features of online management, information statistics, and device monitoring, it is capable of providing exclusive, accurate data models for hotels or business buildings, thus empowering them to improve overall operation capability and service quality.
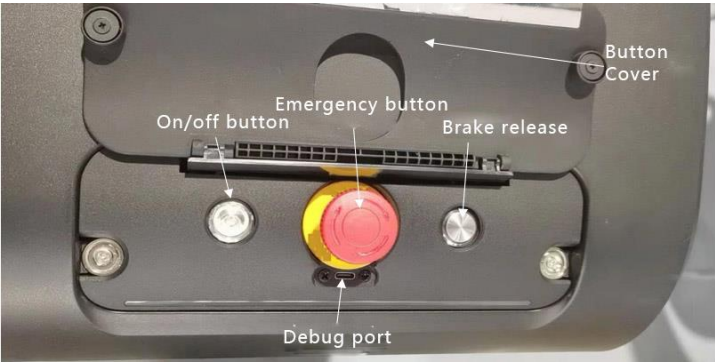
Exterior
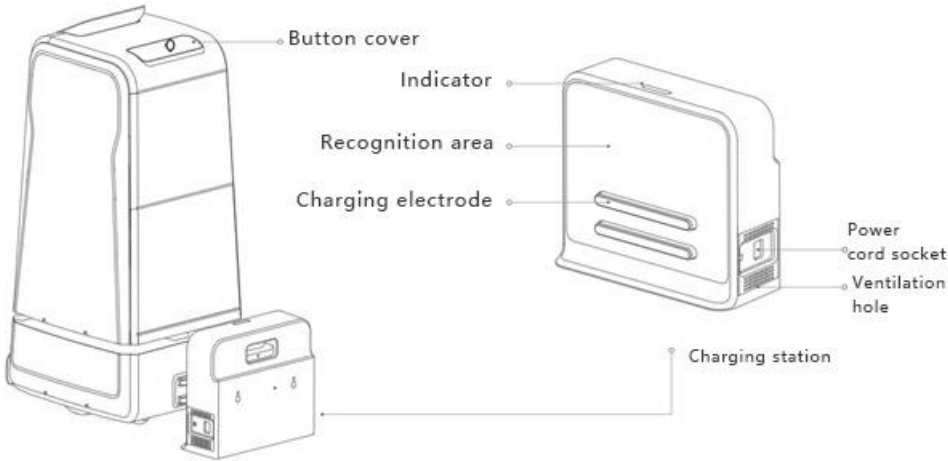
Figure 1-1 Mercury H2 exterior

Figure 1-2 Schematic diagram of charging station

Product Size

Figure 1-3 Mechanical size of Mercury H2

Product Parameters

Robot	
Name	Parameters
Size	530cm*465cm*1057cm
Color	Luxury gold, premium grey, Other color available upon request
Full-robot net weight	68 kg
Maximum load capacity	30 kg
Bay size	Upper takeaway delivery bay: 275mm (W)*275mm (H)*300mm (D) Lower takeaway delivery bay: 300mm (W)*275mm (H)*325mm (D)
Localization and navigation methods	2D Lidar
Localization accuracy	5 cm
Obstacle avoidance methods	Two depth cameras, magnetic sensors, bumper sensors, and lidar for multi- sensor fusion
Moving speed	0–1.2 m/s
Minimum width for passage	750 mm
Range of movement for overcoming obstacles	20 mm vertically and 40 mm horizontally
Passing slope	0–10°
Battery life	3–9H
Standby time	> 8H
Power rating	60W
Rated output	DC 25.2V 2A
Charging mode	Autonomous recharging, manual recharging
Network ports	4G/WiFi
Applicable altitude	≤ 2000 m
Management system	Cloud management platform
Operating temperature	0°C–40°C
Operating humidity	30%–70%RH (No condensation)

| Charging station	
Name	Parameters
Size	360mm*150mm*320mm
Color	White
Rated input	100V-240V 50/60Hz 3A MAX
Rated output	DC 25.5V 6A

Description of Features

Item Delivery

Mercury H2 is primarily designed to assist the take-out staff or hotel service staff to achieve efficient delivery of goods. The delivery service includes general goods delivery and takeaway delivery. By making the delivery service convenient and smart, it solves the pain points for front desk management in hotels or office buildings. The robot has two delivery bays. Different from traditional services, it can be dispatched at will. By enabling multi-point delivery at a time, it reduces labor costs while improving operational efficiency.

When the robot is in use, the service staff will run the App on the screen, place the items into the delivery bay, and enter the room number. Then, the robot will automatically deliver items to the corresponding room and call the room phone to notify the customer. After the delivery, the robot will return to the charging station automatically.

Takeaway delivery process example
Item arrival – The robot arrives at the destination room and calls the customer.
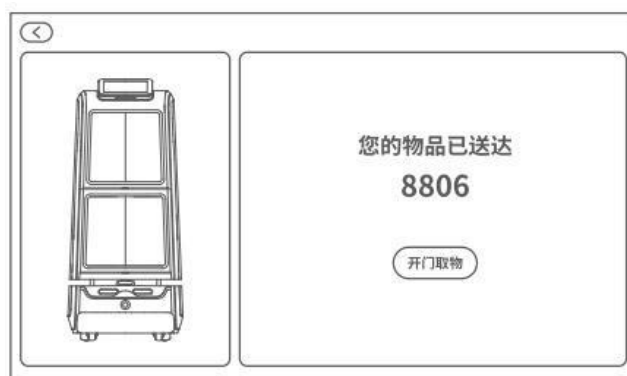
Item pickup – The customer takes out items as prompted by the operation interface. Confirmation of item pickup – The robot detects whether the items have been taken out and closes the hatch after confirmation.
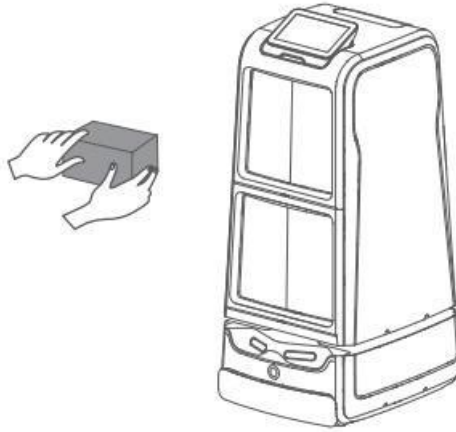
Delivery completed – After the hatch is closed, the delivery process is completed.

Please refer to instructions on the corresponding page.

Autonomous Path-Finding and Obstacle Avoidance

MERCURY H2 comes with SLAM localization and navigation developed by SLAMTEC, which enables autonomous pathfinding through the passages, elevators and rooms of hotels and office buildings. The robot can perform autonomous path-finding according to the delivery address and avoid people and obstacles to accurately deliver the items.

Smart Elevator Control

MERCURY H2 supports delivery in multi-story buildings by elevator self-riding. It can enter, call, and exit the elevator automatically, avoid obstacles and provide voice alerts when entering and exiting the elevator.

Autonomous Recharging

When the robot is in use, the battery power should be sufficient for it to complete the delivery tasks. When the battery power is lower than the threshold, the robot will automatically return to the charging station for charging. In addition, it will also automatically return to the charging station after a delivery task is finished.
2.5 360° Protection
The robot uses multi-sensor fusion methods such as dual-depth cameras, magnetic sensors, bumper sensors, lidar, and ultrasound to accurately identify and avoid moving, static, and suspended obstacles. It also has fall-resistant and collision-resistant protection and emergency stop features, making the delivery process fully protected, secure, and reliable.

Unmanned Delivery

MERCURY H2 responds in real time from the moment it receives a delivery request from a customer. Through the process of automatic mapping, autonomous localization, autonomous path-finding, smart elevator control, safe moving, pickup notification and autonomous recharging, H2 can realize unmanned delivery for customers.

Cloud Management Platform

SLAMTEC provides a smart cloud management platform that enables real-time monitoring of robot devices. Leveraging features of online management, information statistics, and device monitoring, it is capable of providing exclusive, accurate data models for hotels or business buildings, thus empowering them to improve overall operation capability and service quality.

Application Scenarios

Hotels

For hotels, MERCURY H2 can be used to deliver common disposable goods, container retail items, and food to hotel rooms, distribute souvenirs to members and deliver breakfast appointed by VIP customers.
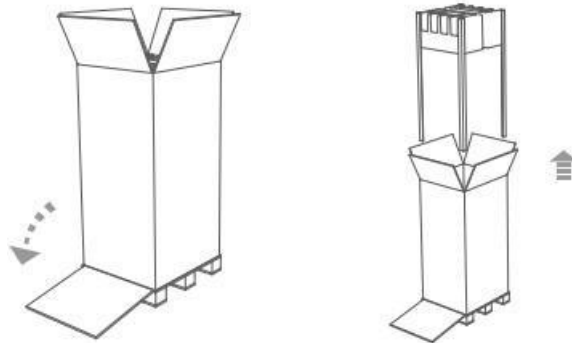
Office Buildings

MERCURY H2 can be used for express delivery and takeaway delivery in office buildings.
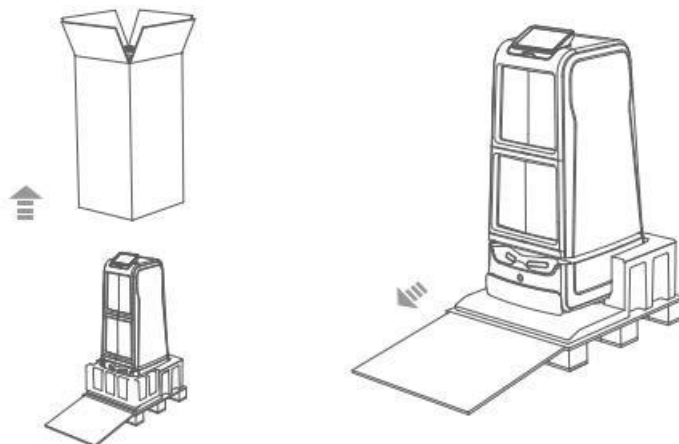
Installation and Power-up

Package Disassembly

1. Lower the front wooden pallet and cut the tape used to seal the top of the packaging.
2. Remove the bubble wrap and four corner pads.

3. Remove the packaging.
4. Remove the front bubble wrap at the lower part and push down the product along the wooden pallet.

Placing the Charging Station and Connecting the Power Supply

Place the charging station against a wall. *Make sure the charging station is placed against a wall with sufficient space left around it, that is, more than 0.35m on both sides and more than 1m at the front. Do not place the robot next to a mirrored wall or in a hollowed-out area. *Do not place the charging station on soft ground (such as a carpet) which will cause height difference and make the robot fail to charge. *During actual application, mark the location of the charging station to prevent incorrect recovery after moving.
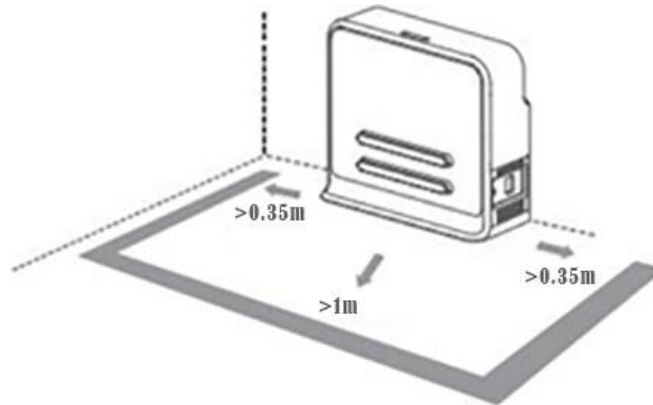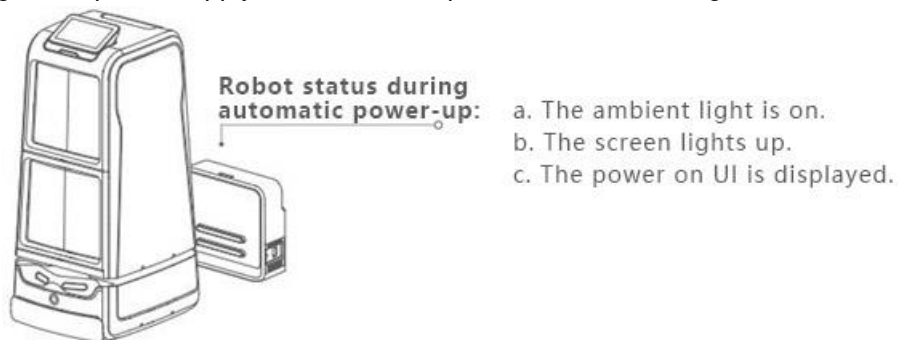

Power-up & Power-off

1. Power-up & Power-off Power-up:

If the robot is not at the charging station, but in any other position, then long press the power switch until the power switch indicator lights up. The system will enter the power-up process. When the front light band lights up and the wheel is in the brake state, the power-up process is completed. If the robot is at the charging station, then short press the power switch until the power switch indicator lights up. The system will enter the power-up process. When the front light band lights up and the wheel is in the brake state, the power-up process is completed. Power off: Long press the power switch until the power switch indicator goes off. Then, the robot enters the power-off process. When the front light band goes off and the robot can be pushed at will, the power-off process is completed.
Notes: During initial use, place the charging station against a wall and align the robot with the charging station. The robot will start automatically.

After connecting to the power supply, make sure the power indicator turns green.

Robot status during automatic power-up:
a. The ambient light is on.
b. The screen lights up.
c. The power on UI is displayed.

Initial Use

Power On Configuration
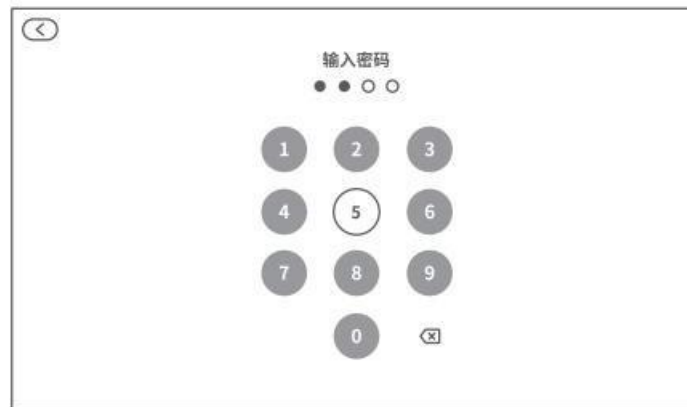For initial use, contact the technical personnel for configuration after the robot is powered on.
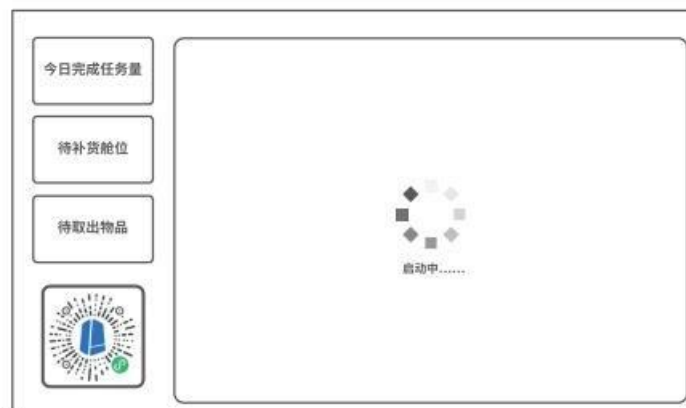
Home Delivery Services

Click the "Home delivery services" button on the screen.

1. Enter the password.

2. Enter the task management interface and start the task.

Please refer to instructions on the corresponding page.

Charging

Align the charging pad of the robot with the charging electrode of the charging station and wait for 10 seconds. When the front light band of the robot lights up, the wheels enter the braking state, and the breathing light of the charging station flashes, the charging process starts.

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Emergency Stop & Brake Release Button and Reset

1. Emergency stop button description Pressing the emergency stop button will immediately stop the robot and abort all motion control commands. Also, it is hard to push the robot manually. After the abnormal state is

rectified, the emergency stop button can be reset according to the indicated direction. After the robot is restarted, it will work normally.

2. Brake release button description Pressing the brake release button will immediately stop the robot and abort all motion control commands. However, the robot can be manually pushed, for example, to the charging station. After the brake release button is released, the robot will work normally and it is hard to push it manually. The robot will perform tasks normally after receiving a new control command.
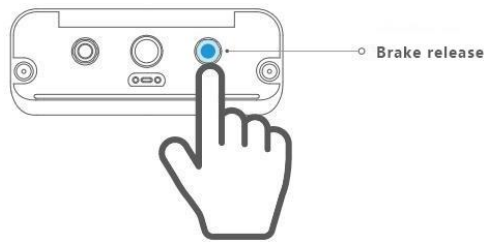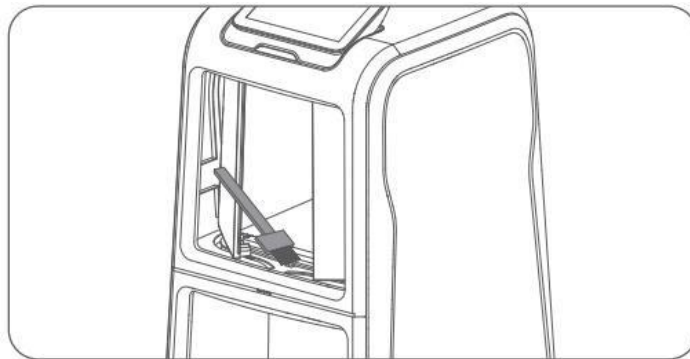

Debugging Port

The commissioning port is generally used for factory commissioning, firmware upgrade, and after-sales maintenance.

Maintenance
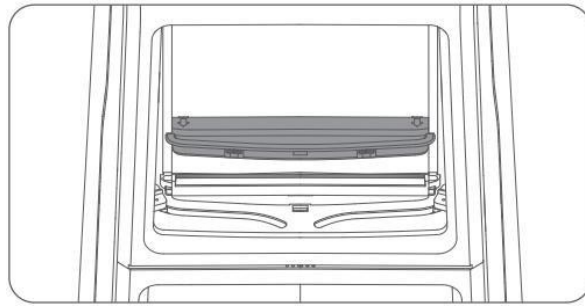
General Maintenance

Automatic door — Clean the automatic door regularly.

Bay — Wipe the inside of the bay with a soft dry cloth in power-off state.

Water collection tray — Push the water collection tray backward with both hands for a certain distance, and take it out. Then, open the cover and clear the water in the tray.

Charging station — Use a soft dry cloth to wipe the charging station and charging electrode in power-off state. 15 / 21 Copyright 2016-2021 Shanghai Slamtec Co., Ltd.
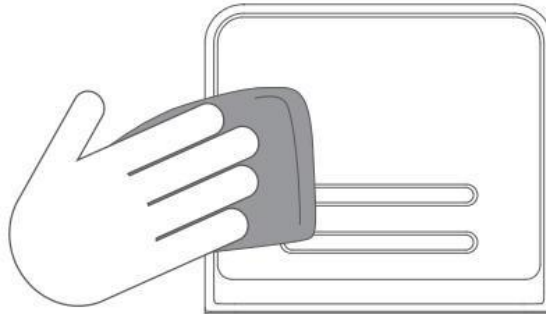
Maintenance Frequency

Robot maintenance primarily includes bay cleaning and inspection, hatch slot inspection, clearance inspection around the radar, foreign matter inspection around drive wheel and universal wheel, and charging station inspection.

The maintenance frequency can be adjusted based on the environment, frequency, intensity, and temperature of robot use.

MERCURY H2 Maintenance Schedule			Interval			
Serial No.	Component	Maintenance Level	Year	Month	Week	Day
1	Hatch slot	Inspection/cleaning	—	—	—	Once
2	Depth camera lens	Wiping	—	—	Once	—
3	Bumper	Cleaning	—	—	Once	—
4	Clearance around radar	Clearance	—	Once	—	—
5	Universal wheel	Clearing	—	Once	—	—
6	Drive wheel	Clearing	—	Once	—	—
7	Charging station	Wiping	—	Once	—	—
8	Robot body	Inspection (after-sales)	Once	—	—	—

Table 5-1 MERCURY H2 maintenance schedule

Special Notes

Charging Station Deployment

Points to consider for determining the location of the charging station:

1. Place the charging station against a wall with sufficient space left around it, that is, more than 0.35m on both sides

   and more than 1m at the front.

2. The adapter plug of the charging station should be close to the power outlet.

3. The charging station should be placed against a wall instead of next to a mirrored wall or in a hollowed-out area.

4. Do not place the charging station on soft ground (such as a carpet) which will cause height difference and make the

   robot fail to charge.

5. During actual application, mark the location of the charging station to prevent incorrect recovery after moving.

Restricted Use Scenarios

To avoid faults or damage, do not use the robot in the following scenarios

1. **Overloading transportation**

   Do not load items that exceed the maximum load-bearing parameter. Otherwise, the robot may fail to work properly. Refer to the product parameter table for the maximum load-bearing parameter.

2. **Passing obstacle height**

   Please ensure that there are no obstacles higher than 20mm in front of the robot, since the robot can only pass obstacles with a maximum height of 20mm. Avoid having the robot take paths across uneven ground or other surfaces with large variations in height.

3. **Mechanical impact**

   Do not push or hit the robot while it is carrying out its functions.

4. **Temperature/humidity**

   Do not use or store the robot in wet locations, or overly hot or humid environment.

5. Ground obstacles

   Please make sure that the robot's path is clean and free of obstacles such as cables or other items.

6. **Hatch foreign objects**

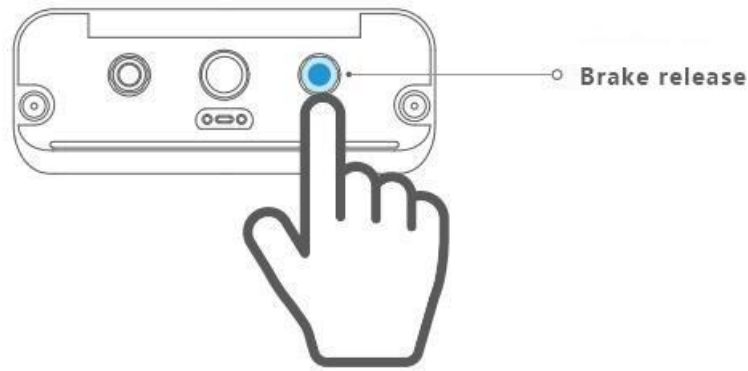   Do not place foreign objects into the gap between the hatch and the bay when the hatch is fully open.
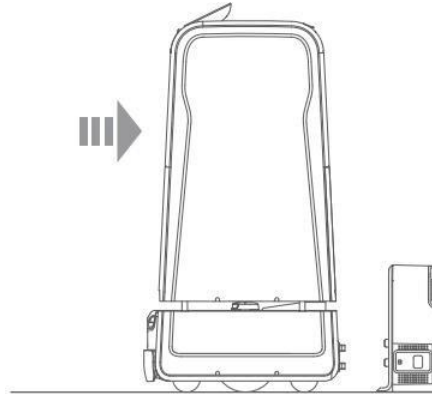
7. **Outdoor use**

   Do not use the robot outdoors.

8. Use the robot only at altitudes below 2000m.

Actions to Take in Case of a Fault that Cannot Be Rectified Immediately

1. Press the brake release button.

Brake release

2. Push the robot back to the charging station.

Forced Hatch Opening

The hatch can be forcibly opened by short pressing the brake release button 10 times continuously when the robot is in any state after power-up. *For emergency use only.

Precautions

1. Users are forbidden to remove and replace the battery by themselves. Using a battery of incorrect type may cause an explosion. If the battery needs to be replaced, contact the manufacturer first and use the same or similar type of battery recommended by the manufacturer.
2. Used battery management: Used batteries should be collected in a designated area or recycled by the battery manufacturer. Do not put used batteries and circuit boards and their components that may contain batteries together with other waste products. For battery recycling, please contact the local recycling agency.
3. Contamination prevention: Avoid placing the robot in an environment where contaminants exist for long periods of time (e.g., dust, acids, corrosive gases, salts). For minor contamination caused during the delivery and use process of the robot, clean it promptly by referring to the maintenance manual.
4. Radiation prevention: External light sources (e.g., lasers) will affect the operation of the robot. If any external light source exists in the environment, isolation measures should be taken to avoid interference with the robot which may result in exceptions during robot operation.
5. Mechanical impact protection: To prevent bumper or collision, make sure that the robot's path is clean and free of foreign mattes. Do not push or hit the robot while it is carrying out its functions. Otherwise, the robot may malfunction.

Common Faults and Troubleshooting

When an exception occurs in the operation of the robot, rectify it by referring to the following table or tips displayed on the screen.

Serial No.	Fault prompt	Troubleshooting
1	Bumper sensor exception	Check whether the bumper sensor is stuck and tap the bumper several times to make the bumper recover to the right place.
2	Automatic door exception	Check whether the door is blocked when it is opened or closed and whether noises are generated. If there is a foreign object in the track, remove the foreign object and restart the robot.
3	Low power	Open the button cover, press the brake release button, and push the robot back to the charging station for charging.
4	Charging failure of robot	Check whether the power cord plug of the charging station is inserted into the socket and whether the charging station indicator lights up normally.
5	System crash	Push the robot back to the charging station, try to restart the robot, and short press the brake release button continuously to forcibly open the hatch and take out the items.
6	Power-up failure	Check whether the charging station is connected to the power supply. If the failure persists after the charging station is connected to the robot, contact the after-sale service.
7	Charging failure	Make the robot connect to the charging station again. If the failure persists, contact the after-sales service.
8	Failure in returning to the charging station	1. Check whether the position of the charging station has been changed. If yes, contact the after-sales service. 2. Check whether there is a slope at the location of the charging station. If yes, contact the after-sales service. 3. Push the robot to the charging station and try to restart the robot.

9	Failure in entering/exiting the elevator	1. Check whether there is an obstacle in the elevator. 2. Confirm the network signal condition near the elevator. 3. Push the robot to the charging station and try to restart the robot.
10	Password error	1. Verify whether the password is correct. 2. If the password error is still displayed after a correct password is entered, contact the after-sales service.
11	Order creation failure	1. Retry after about two minutes. 2. If the failure persists after multiple attempts, contact the after-sales service.

Product Standards

Full-robot	GB 4943.1 GB/T 15706 GB/T 16855.1 GB/T 37283 GB/T 37284
Drive motor	EN IEC 61000-6.1: 2019 EN 61000-6-3: 2007+A1: 2011+AC: 2012
Lidar	EN 55032: 2015 EN 61000-3-2: 2014 EN 61000-3-3: 2013 EN 55024: 2010 +A1: 2015 IEC 60825(CLASS 1)
Battery	IEC/EN 62133-2: 2017 EN 61000-6-3: 2007+A1: 2011+AC: 2012 EN IEC 61000-6-1: 2019 EN IEC 61000-3-2: 2019 EN 61000-3-3: 2013+A1: 20

- Do not use the product in conditions or ways not described in the Manual to avoid damaging the robot.
- Please refer to the actual product for precise details. Our company reserves the right to update or change the product without prior notice.
- Product manual version: V1.0

Certificate of Conformance

- **Manufacturer** nambe: Shanghai Slamtec Co., Ltd.
- **Address:** Unit 01, 2F, Building E, Shengyin Tower, No. 666 Shengxia Rd., Shanghai, China
- **Phone:** (+86) 021 68581569

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Documents / Resources

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Manuals+,