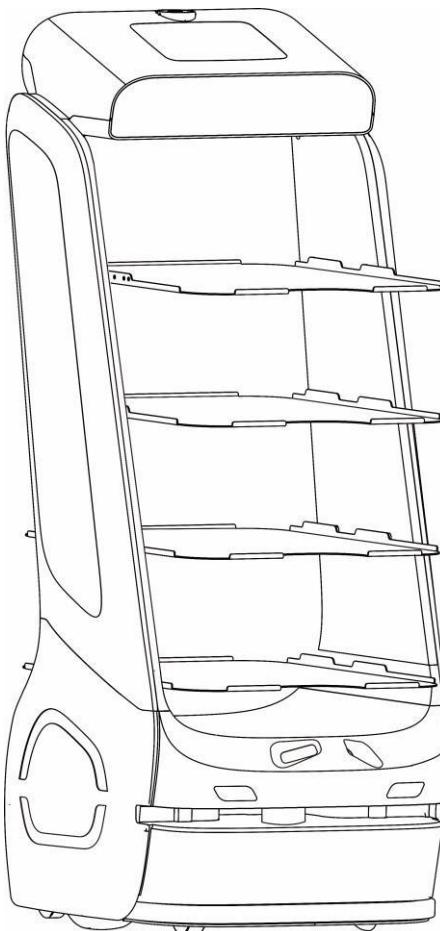


# Delivery Robot

## User Manual



# Declaration

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Without the express written permission of Keenon Robotics Co., Ltd., any unit or individual shall not copy, duplicate, transcribe or translate partial or all contents in this Manual arbitrarily, nor propagate in any way (electronic, photocopying, recording, etc.) for profits.

The product specifications and information mentioned in this Manual are for reference only. If the contents are updated, there won't be further notice. Unless otherwise specified, this Manual will be used as the application guide only, and no statement herein shall constitute any form of warranty.

# Foreword

Honorable user, welcome to select the Delivery Robot . Before using your robot, please read this Manual carefully, get familiar with and use your robot gradually according to the instructions in the Manual.



@Keenon Robotics

# Brief Introduction to the Manual

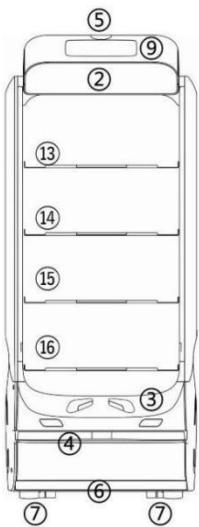
This Manual mainly introduces the functional characteristics, methods for installation and usage and precautions in usage of the Delivery Robot .

This Manual includes the following contents:

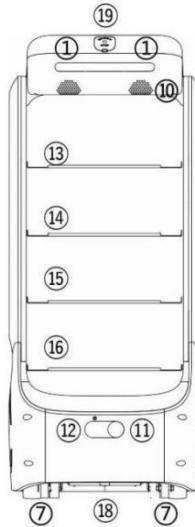
1. Introduction to the robot: This part briefly introduces the basic functional characteristics of the robot, and displays the structural information of the robot in detail.
2. Operation steps: This part introduces the preparatory works and precautions during the installation and use of the robot.
3. Appendices: This part introduces the common faults, detailed technical parameters and safety precautions of the robot.

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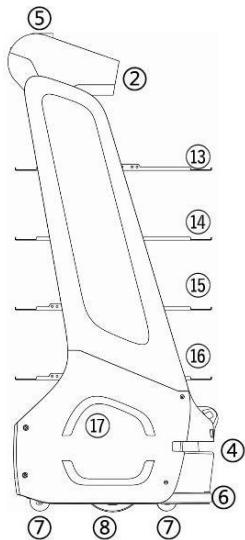
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(Front View)



(Side View)



1. Touch area
2. Expression board
3. Stereo vision
4. Laser radar
5. Image module
6. Collision proof edge
7. Driven wheel
8. Driving wheel
9. Touch screen
10. Horn
11. Power switch
12. Manual charging port
13. First floor tray
14. Second floor tray
15. Third floor tray
16. Fourth floor tray
17. Automatic charging port
18. Power Switch
19. Emergency stop switch

Figure 1 Structure Drawing of Delivery Robot

**Note: The figure above is for reference only, the specific appearance and color of product shall be subject to the material object**

# Introduction to the Robot

- The Delivery Robot operates indoors, and is applicable to public indoor occasions such as restaurants, hotels, supermarkets, cinemas, KTV and business offices.
- The Delivery Robot realizes the core functions of fully autonomous positioning and navigation and intelligent obstacle avoidance through machine vision and laser radar. It can move with full autonomy indoors, carry out intelligent voice interactions with people, and provide people with services such as meal delivery in restaurants, transfer of office files and express distribution.
- The product described in this Manual is the Delivery Robot of model T5.

# Main Structure of the Robot

Figure 1 is the main structure drawing of the Delivery Robot . The chassis of the robot has the two-wheel driving and four-wheel driven structure. It realizes the autonomous positioning through machine vision and laser radar, and achieves intelligent obstacle avoidance by integrating touch switch and other sensors. Its touch screen is for users to operate and use the robot system.

Figure 2 is the structure drawing of charging pile of Delivery Robot . The robot has the intelligent autonomous recharging function. It can search, match and contact the charging pile independently, so as to realize automatic recharging.

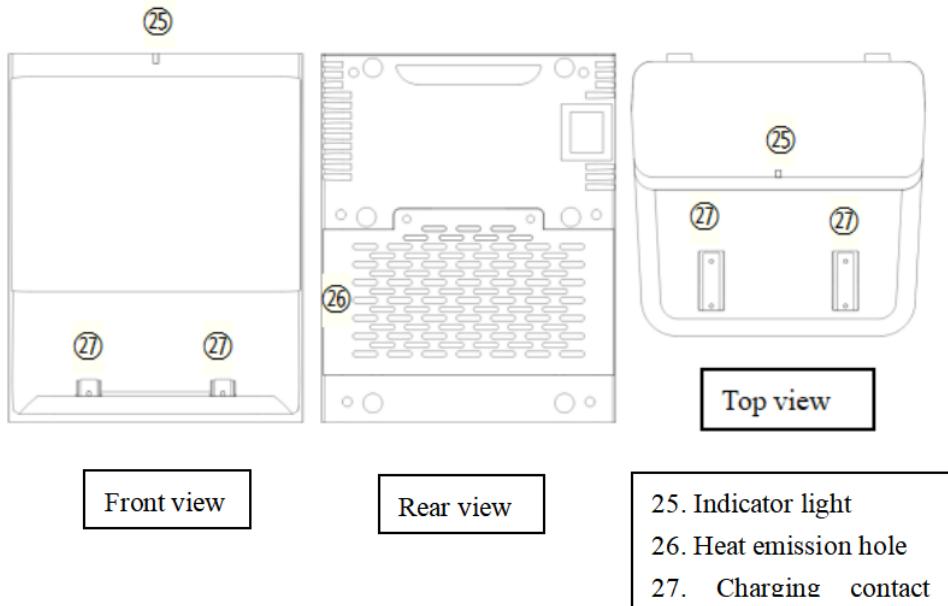


Figure 2 Structure Drawing of Charging Pile

# Operation Steps

Please start to use your robot by observing the following operation steps.

## Installation

### 1. Mapping by the Robot

Before autonomous movement, the robot needs to get familiar with the mobile environment, stores and identifies the operation environment in the mode of map. This step is called mapping.

When the robot's indoor environment has significant changes (for example, re-decoration, the movement of the robot to a new operation site, or the rearrangement of indoor items), please contact the customer service via 400-9651-808 for re-mapping.

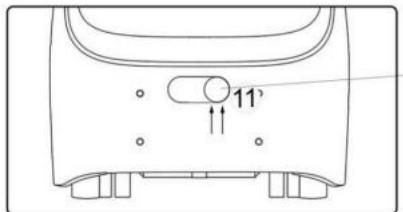
### 2. Arrangement of Charging Pile

The robot has the automatic recharging function, the charging pile shall be installed in a location convenient for charging on the operational site, and the installation of charging pile shall be completed by the technician of the manufacturer. Once it is fixed, please don't move it arbitrarily. If the location of charging pile needs to be changed, please contact the customer service via 400-9651-808 to reset the location of the charging pile.

# Startup

## 1. Power-on/Power-off Button

The power switch is located on the chassis behind the robot. Open the silica gel cover below the chassis, and a button on the left will be seen, namely the power switch. Find the position of the power switch as shown in Figure 3, press the power switch with a finger, and the robot will be booted. After the system is booted, the robot can be used normally after waiting for about 40s. When the robot needs to be powered off, please turn off the power switch in the same way. After the power switch is turned off, the robot will be powered off immediately.



Note: Firstly, open the silica gel cover below the chassis, and press the red button on the left with a finger

Figure 3 Location Diagram of the Power Switch

## 2. Booting of the PEANUT APP

- ① After booting the power switch, the system desktop will display the startup LOGO, PEANUT animation and Android desktop in sequence, and the system booting duration is about 40s.
- ② Under the default setting, the system will start the PEANUT APP automatically after it is booted. If the system fails to boot the PEANUT APP, please find the PEANUT icon on the desktop, as shown in Figure 4, and click this icon to boot the APP.

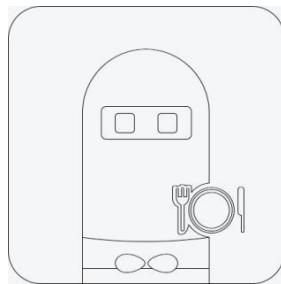


Figure 4 Icon of the PEANUT APP

After the PEANUT APP is booted, you can use the Peanut Robot normally.

# Setup

Users can carry out relevant setups of the robot through the PEANUT APP, and the steps for entering the setup page of the robot are as follows: (taking meal delivery App as an example)

(1) Enter the user setup page:

- ① Click the [=] icon on the upper left corner of main page, and open the pop-up window on the side;
- ② Find the [Setup], and click it to enter.

(2) Enter the super setup page:

- ① Find the [Know Me] menu in user setup;
- ② Find the [Manufacturer] column, make three quick clicks, and the super password page will pop up;
- ③ Enter the password (contact the supplier to provide the default password) to pass, and enter the super setup page.

## 1. Connect the Wi-Fi

When the robot is used for the first time, please connect the robot to the network via Wi-Fi, and the setup steps are as follows:

- ① Enter the user setup page, or enter the super setup page, and find [Wi-Fi Network];
- ② Start the WLAN (Wi-Fi) function of the system, and search for the available Wi-Fi.
- ③ Select the available Wi-Fi, and enter the password.
- ④ Click the [Connect] button until the Wi-Fi connection is successful.

## 2. Charging Setup

\*The operation steps for the setup of [Minimum Electricity Consumption] of the robot are as follows:

- ① Enter the super setup page.
- ② Click the [Power Management] menu and the power management setup page will be displayed.
- ③ Slide the page upward, find and click [Minimum Electricity Consumption].
- ④ Select or input the numerical value, and save it.

Note: If there's no charging pile, directly skip to **[3. Adjust the Volume]**

\*The operation steps for the setup of [Automatic Recharging Electric Quantity] of the robot are as follows:

- ① Enter the super setup page.
- ② Click the [Power Management] menu, and the power management setup page will be displayed.
- ③ Slide the page upward, find and click [Automatic Recharging Electric Quantity].
- ④ Input the numerical value, and save it.

Within the working period, when the operating electric quantity of the robot is lower than the [Automatic Recharging Electric Quantity], the robot will arrive at the designated charging pile for charging automatically; if the administrator cancels during charging, when the operating electric quantity is lower than the [Minimum Electricity Consumption], the robot will stop

operating and trigger the automatic recharging.

The operation steps for the automatic recharging working time setup of the robot are as follows:

The robot has the intelligent automatic recharging function, and users can set the working time of the robot in the PEANUT APP:

- ① Enter the user setup page and find [Charging Setup]; or enter the super setup page and find [Power Management].
- ② Find the “Working Period” function setup column.
- ③ Click the working period adding button, and the time setup interface will pop up.
- ④ Slide up and down in the pop-up window of time selector, select the start time and end time separately, and then confirm.
- ⑤ If the start time and end time are changed, click the displayed time once again (e.g. 9:00); and it is allowed to add multiple working periods, but not allowed to set time interleaving.
- ⑥ The default working days are from Monday to Friday. The robot will return to the charging pile for charging automatically at the end time of working every day, and the working days can be added or deleted as required.
- ⑦ For the working period having been added for use, it is supported to delete or close; if the working period is closed, the robot won’t go to the charging pile for charging automatically at the end time point of working.

### **3. Adjust the Volume**

If the bottom of screen displays the system menu bar, directly click the

volume button to adjust the volume. If the system menu bar isn't displayed, operate as follows:

- ① Enter the user setup page.
- ② Find the [Volume Adjustment] menu, in which the music volume and voice volume can be adjusted respectively.
- ③ Slide towards the right, or click the volume adjustment button on the right, the volume will increase.
- ④ Slide towards the left, or click the volume adjustment button on the left, the volume will decrease.

#### **4. Hiding Status Bar**

- ① Enter the super setup page.
- ② Click the [System Setup] menu.
- ③ Find [Hiding Status Bar], the default switch will be turned on, and the status bar on the desktop will be hidden; click the switch on the right once again, the default switch will be turned off, and the status bar will be displayed.

#### **5. Setup of Daemon Mode**

When the [Daemon Mode] of the robot is booted, the robot will automatically test whether the PEANUT APP is operating, and boot the PEANUT APP automatically. The operation steps are as follows:

- ① Enter the super setup page.
- ② Find the [Daemon Mode] of [System Setup], the default switch will be turned on, i.e. the daemon mode will be booted, and the PEANUT APP will be rebooted automatically if it is accidentally closed.
- ③ Click the switch button on the right of the [Daemon Mode] once again,

the function of daemon mode will be closed, the PEANUT APP won't start automatically after it is closed, and it is necessary to click the APP icon manually before operating the PEANUT APP.

## **6. The operation steps for the startup self-booting setup:**

By default, the system will boot the PEANUT APP automatically. When the PEANUT APP is without startup self-booting, please set the startup self-booting of PEANUT APP according to the following operations:

- ① Enter the super setup page.
- ② Find and click [Startup Self-Booting] of [System Setup], the default switch will be turned on, i.e. the startup self-booting function will be started. After the successful setup, the robot will boot the PEANUT APP voluntarily when it is started every time.
- ③ Click the switch button on the right of [Startup Self-Booting] once again, the startup self-booting will be closed.

## **7. The operation steps for the robot name setup are as follows:**

- ① Enter the super setup page.
- ② Find the [Robot Name] of [System Setup], and enter the name (nickname) setup page.
- ③ Complete the name setup, click the [Save] button on the upper right corner of the page, return to the previous page, and the name will be displayed.

# Delivery

The deployment personnel will create the map and corresponding resource allocation; Then start the PEANUT APP. And the robot will work for you. The operation steps are as follows:

- ① The pantry helper will place the items to be delivered on the trays of the robot;
- ② On the screen interface at the top, select one or more destination table numbers, i.e. destinations of a task of meal delivery robot;
- ③ Click [Set Out Immediately].
- ④ The robot carries the meals and moves towards the destinations, accompanied by voice reminder.
- ⑤ The robot arrives at the corresponding destination, and prompts the waiter to pick up meals via voice.
- ⑥ The waiter takes away the meals, click [Confirm Pickup] on the screen, and the robot will move towards the next destination or return to the initial location.

# Charging

1. **Charging by Adapter** (It's not allowed to operate the robot during the charging process by adapter)
  - ① Open the silica gel casing outside the [Manual Charging Port] at the back of the robot, and use the charging plug of adapter to connect the robot.
  - ② After the successful connection, the indicator light of the adapter turns red, and the screen interface skips to the charging page, indicating that the charging is in progress.
  - ③ When the indicator light of adapter turns green, it indicates that the charging is completed. Please disconnect the adapter and tuck back the silica gel casing outside the charging port of the robot.

## 2. Intelligent Autonomous Recharging of the Robot

The robot has the intelligent autonomous recharging function. When the following three conditions are met, the robot can realize the intelligent autonomous recharging.

- The user has bought the charging pile, and the charging pile has a fixed position and favorable energization.
- The electric quantity of the robot is lower than the value of recharging electric quantity set by the user.
- The robot is outside the working period, and its electric quantity is lower than 100%.

Please refer to the “Charging Setup” in the setup part of this Manual for the setup of triggering condition of autonomous recharging.

### 3. The user triggers the charging of robot manually

The user can trigger and control the automatic recharging of the robot by operating the PEANUT APP. The specific operation steps are as follows:

- ① Enter the user setup page and find [Charging Setup], or enter the super setup page and find [Power Management].
- ② Click the [Charge Immediately] button, and the robot will set out immediately to look for the charging pile for charging.
- ③ After the robot arrives at the location of charging pile, it starts to match and connect the charging pile autonomously.
- ④ Charging can be started after the robot has matched and connected the charging pile.

The user can also push the robot manually to the charging pile for charging, and the specific operations are as follows:

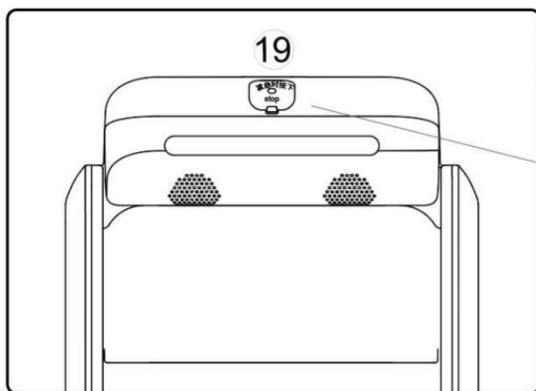
- ① Enter the user setup page and find [Charging Setup]; or enter the super setup page and find [Power Management].
- ② Click [Push to Charging Pile Manually] below [Charge Immediately], and the page will skip to the manual charging page.
- ③ The user can push the robot to the location of charging pile manually.
- ④ Align the back of robot with the charging pile, then push the robot onto the charging pile, making the automatic recharging port at the bottom of robot contact with the contact plate of charging pile.
- ⑤ After the contact is successful, the page will display the successful connection, and the charging can be started.

# Emergency

When the robot presents the following situations, the user can shut down the robot by pressing the emergency stop switch at the back of the robot:

- ① The user needs to move the robot when it is operating
- ② The robot is in a state of abnormal operation, which may cause damage and other situations to the surrounding environment

The position of the emergency stop switch and the operation steps are shown in Figure 5:



19. Emergency Stop Switch

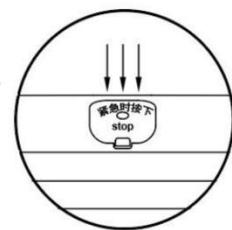


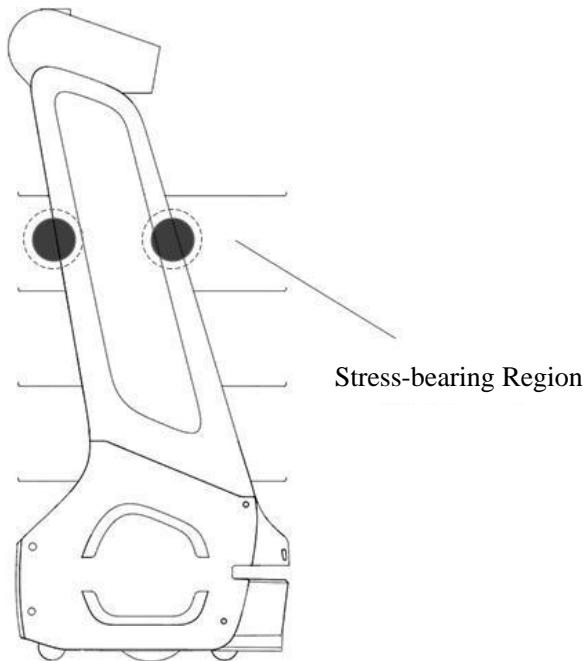
Figure 5 Partial Enlarged Drawing after Opening the External Cover of the Emergency Stop Switch

The emergency stop switch of the robot is on the top of the robot, i.e. the location shown by No. ⑧ in the figure. The emergency shutdown of the robot can be realized by pressing the red emergency stop switch.

## Carrying the robot

The robot is valuable equipment, when it needs to be handled artificially, please operate by strictly observing the following instructions.

As shown in Figure 6, the locations of stand columns on both sides of the robot body are stress-bearing region. You can lift the robot by holding the regions with both hands. In the handling process, please pay attention to keep the robot upright all the time.



**\*Note:**

The middle locations on both sides of the robot body mentioned above are the only stress-bearing part for handling of the robot. Please handle the robot in strict accordance with the instructions. In the handling process, it is strictly prohibited to directly pull and lift the bottom of the robot, dump the robot, directly pull and lift the tray, directly pull and lift the clearance of laser layer, or directly pull and lift the face and head of the robot. In the handling process, the damage of the robot caused by improper operation shall be borne by the user.

# Appendices

## List of Abnormities and Fault Clearance

Fault Phenomena	Possible Reasons and Solutions
The robot fails to be booted normally	<ol style="list-style-type: none"><li>1. The electric quantity is insufficient, please connect the robot for charging via the adapter</li><li>2. For other reasons, please contact the customer service staff to deal with</li></ol>
The robot fails to be charged normally	<ol style="list-style-type: none"><li>1. The location of charging pile changes. Please place the charging pile at the initial set location</li><li>2. The charging pile isn't connected to the power supply, please connect it to the power supply</li><li>3. The charging pile is shielded, please guarantee that there are no shelters in front of the charging pile</li><li>4. For other reasons, please contact the customer service staff to deal with</li></ol>
Unable movement navigation of the robot	<ol style="list-style-type: none"><li>1. The robot is in the dead zone of map, please shut down the robot and push it to the vicinity of charging pile for restart of the navigation</li><li>2. The vision module is covered, please ensure that the vision positioning module isn't covered</li></ol>

	<ol style="list-style-type: none"> <li>3. The robot has a radar fault, please check whether the laser radar rotates normally</li> <li>4. The robot has a fault of impact switch, please check whether the impact switch is squeezed</li> <li>5. For other reasons, please contact the customer service staff to deal with</li> </ol>
The robot fails to play the voice	<ol style="list-style-type: none"> <li>1. The robot's voice is turned off or its volume is too low, please reset the volume</li> <li>2. For other reasons, please contact the customer service staff to deal with</li> </ol>
The movement of robot is abnormal	<p>Please switch off the power supply of the robot immediately, and contact the customer service staff to deal with</p>
The robot tumbles	<p>Please switch off the power supply of the robot immediately, and contact the customer service staff to deal with</p>

## Parameters of Robot

Model	T5
Product Dimension	506*502*1205mm
Tray Dimension	490*404*188mm (Top Layer) 490*404*176mm(Other Layer)
Product Net Weight	55Kg
Maximum Travel Speed	1.2m/s
Loads	15Kg for the each layer
Maximum Climbing angle	$\leq 5^\circ$
Network Interface	2.4G WIFI (2412-2462MHz)
Battery Capacity	DC 48V 15Ah
Rated Power	40W
Endurance	Continuous operation for more than 15h
Standby Time	Standby time is more than 48h
Service Life	20,000h
Working Temperature and Humidity	0 - 45°C, RH: 5% ~ 85%, no dust
Working Environment	Indoor environment, flat and smooth ground
Charging Mode	Support automatic/manual charging, input power supply: 100-240V~, 50/60Hz
Dimension of Charging Pile	230*220*290mm
Weight of Charging Pile	1 kg

Storage Temperature	-30°C-60°C
Working Air Pressure and Elevation	One standard atmospheric pressure, the elevation doesn't exceed 1,000m

## Safety Precautions

### Restrictions:

This product is a wheeled robot, which is restricted to be only used in indoor flat environment (with smooth ground, slope gradient of less than 5 degrees, and protrusions not higher than 1cm). Please don't use it in the outdoors (e.g. open balcony), rough ground (e.g. stairs) and other environments.

Please don't use the robot in the suspending environment (e.g. duplex floors, open balcony, housetop, stairway) or in the environment without guardrail.

Please don't use the robot when the ambient temperature is higher than 50°C or lower than 0°C, or when there are any liquid and viscous materials on the ground.

Before use, please put away various wire rods on the ground in the environment, so as to prevent the operating robot from being dragged.

Before use, please remove the sharp objects (such as decoration wastes, glass, iron nails, etc.) on the ground, so as to avoid the damage to the chassis of the robot.

Please don't place any non-transportable objects (including children and pets) on a stationary or operating robot.

Please don't push or handle the robot when it's in operation.

Please don't move the robot at random, when moving, please handle it in strict accordance with the user's instruction manual.

Please clean and maintain the robot and charging pile in the state of shutdown or outage.

Please don't use hardware or sharp objects to collide with the robot.

Please don't sprinkle any liquid into the robot.

Please don't push over the robot or place it upside down.

The robot is an electronic product, please don't make the robot get close to the fire.

If you need to transport the product, please ensure that the robot is in the shutdown state and it is suggested to package with the original packaging box.

Please use this product according to the instructions in the user manual or start guide, any loss or damage caused by improper use shall be borne by the user.

## **Battery and Charging:**

Please don't use any third-party battery, power adapter or charging pile.

Please don't disassemble, repair or refit the battery or charging pile without permission.

Please don't place the charging pile nearby the heat source (e.g. heating radiator, etc.)

Please don't use the wet cloth or wet hands to wipe or clean the contact plate of charging pile.

Please don't throw away discarded batteries at random. It is suggested to be disposed by a professional institution.

If the robot isn't used for a long time, please shut down the robot after it is fully charged and place it in a cool and dry place. Charge the robot at least

once every month to avoid battery damage.

## Material Testing:

The main components of the robot have passed the testing by the EU ROHS (*Restriction of Hazardous Substances*), and conform to the requirements of relevant national laws and regulations.

### Caution:

This device complies with Part 15 of the FCC Rules / Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference. (2) this device must accept any interference received, including interference that may cause undesired operation.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of 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.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### MPE Reminding

To satisfy FCC / IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.

To ensure compliance, operations at closer than this distance is not recommended.

*L'antenne installée doit être située de façon à ce que la population ne puisse être exposée à une distance de moins de 20 cm. Installer l'antenne de façon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l'antenne.*

*La FCC des États-Unis stipule que cet appareil doit être en tout temps éloigné d'au moins 20 cm des personnes pendant son fonctionnement.*

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