



GL F3

Gargantua Series Restaurant Service Robot

Product User Manual

Model: F5M11



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GL-F3 Gargantua series restaurant service robot is a commercial smart food delivery robot developed by Gargantua (Suzhou) Robot Co., LTD. It is designed to empower the intelligent transformation of restaurants and banqueting rooms by replacing manual labor with machines to reduce operation costs and improve service efficiency. The product provides a full range of functions, including multi-point food delivery, one-touch tray return, call for delivery, multi-robot collaboration, smart obstacle avoidance, and autonomous recharging. By introducing the smart robot services, restaurants will be able to build a creative brand image and enhance competitiveness

Exterior

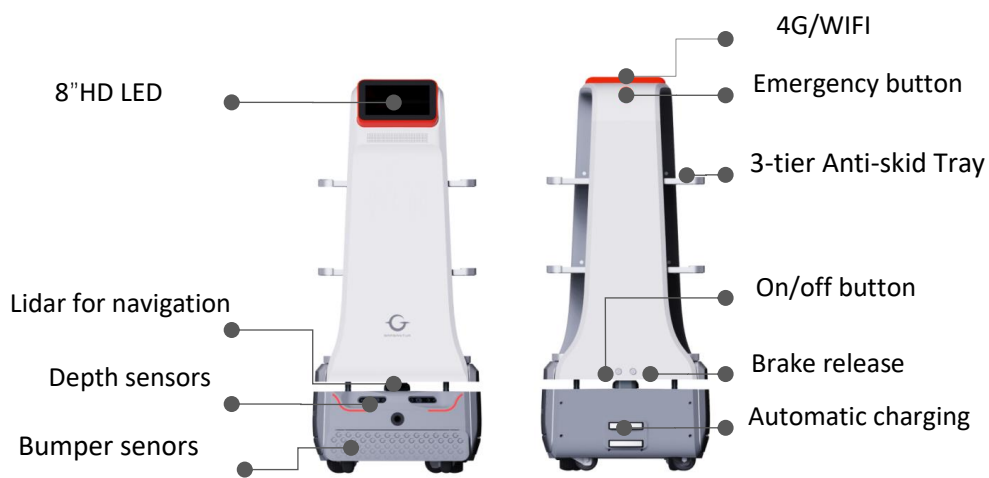


Figure 1-1 The Major Parts of GL-F3

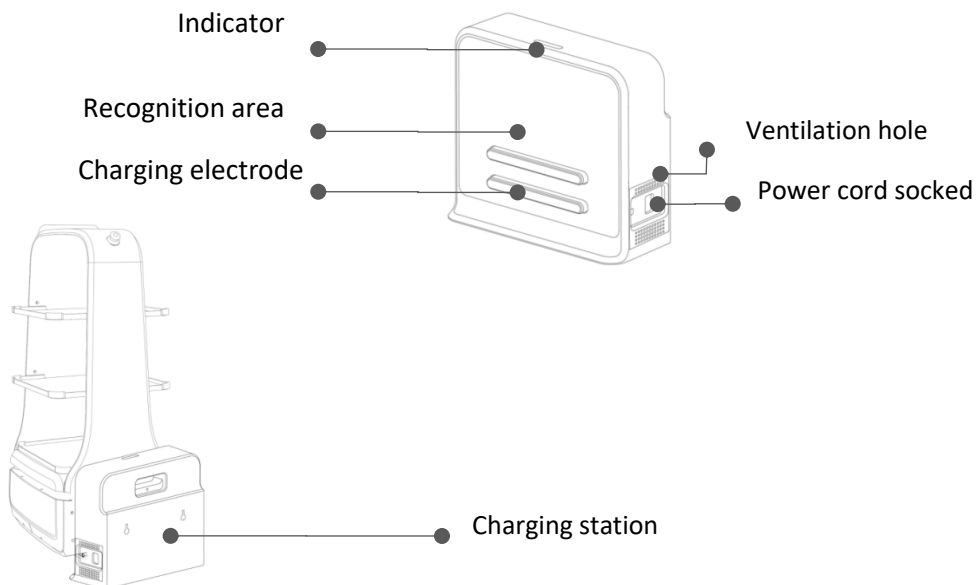


Figure 1-2 The Major Parts of Charging Station

Product Size

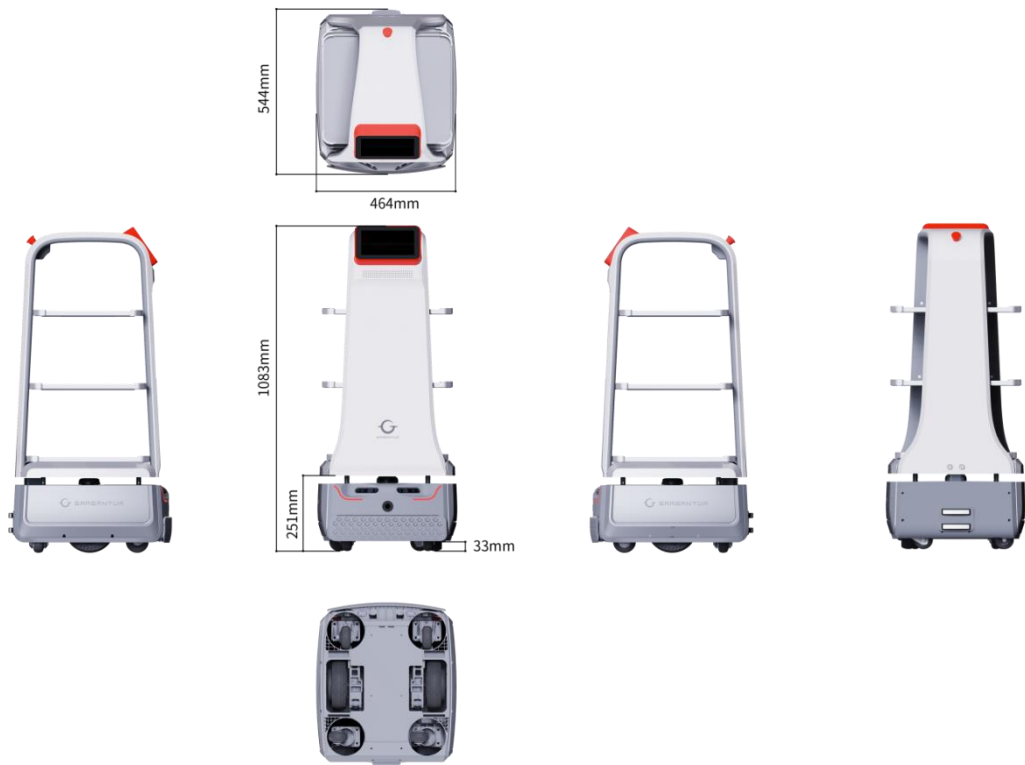


Figure 1-3 The GL-F3 Robot Dimensions

Product Parameters

Robot	Parameters	
Model	GL-F3	
Size	545*466*1088 (L*W*H Unit:mm)	
Material	Galvanized steel and aluminum alloy frame, ABS housing	
Screen	8-inch, 1280×800 resolution	
Sensors	Two depth sensors working in tandem, magnetic sensors, bumper sensors, lidar, and other sensors.	
Full-robot net weight	64kg	
Maximum load capacity	30kg	
Tray	3-tier Anti-skid Tray	
	Top: 426*356*215	
	Middle: 426*380*240	
	Bottom: 396*404*240 (L*W*H Unit:mm)	
	Each floor 10kg	
Minimum width for passage	Minimum 750 mm	
Network ports	4G/WIFI	
Lidar Sensor	Count: 1units Max Scan Radius: 30m, 360°	
Depth Sensor	Count: 2units Detection Range: 0.4m - 2m	
Bumper sensors	Count: 2units Min Detection Range: 1 cm	
Mapping Performance	Map Resolution	5cm
	Max Mapping Area	500m x500m
	Max Move Speed	1.0m/s
Motion Parameters	Max Slope Performance	Slope 17.5% (Slope Angle10°)
	Passing Obstacle Height	2cm
	Passing Obstacle Width	4cm
Battery	Charging Time	< 4.5h
	No-Load Operating Time	≥9.5h

Figure 1-4 The GL-F3 Robot Parameters

Multi-language Support

When you first use the robot, you can select a language among Chinese, Japanese, Korean, and English depending on your needs, and the voice messages will be available in the selected language.



Figure 2-1 Multi-language Support

Food Delivery

The primary function of GL-F3 is to deliver food. When you select the manual operation mode, enter the food delivery interface, put the tableware and food on the designated tray, select the corresponding tray and delivery location on the screen, and tap "**Xiaolan, setting off!**". The robot will automatically deliver the meal tray to the designated location and return after the customer picks up the meal.

Select "**Manual Operation Mode**"

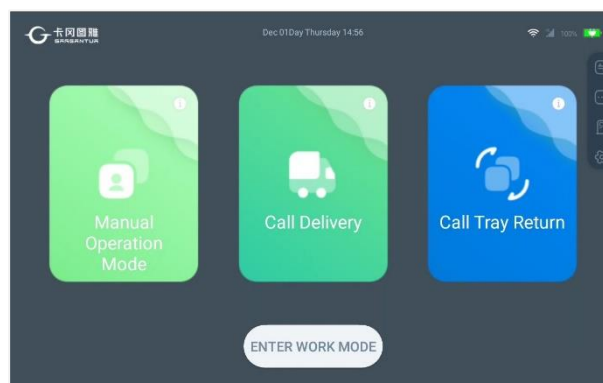


Figure 2-2 Working Mode Selection

Select the food delivery location in the right list.

Put the meal tray into the tray, select the corresponding tray and its delivery location on the screen, and tap "Xiaolan, setting off!"

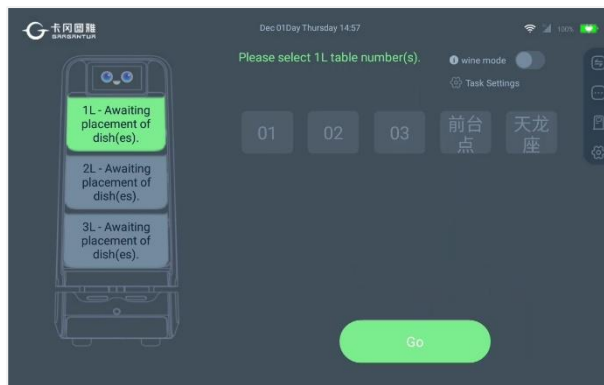


Figure 2-3 Select Food Delivery Location

Pick up the meal

After reaching the delivery location, the robot will remind the customer to pick up the meal via voice alert. The customer only needs to tap **"Arrived"** after meal pick-up.

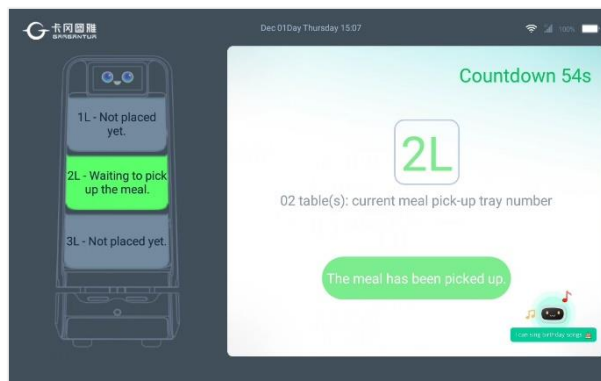


Figure 2-4 Pick Up the Meal

Manual Tray Return

On the food delivery screen, tap the mode switch icon in the upper right corner.

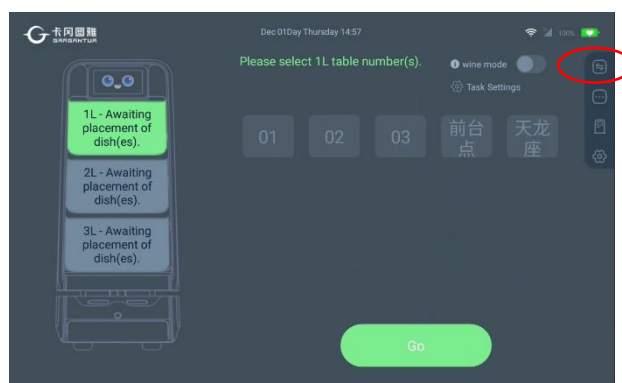


Figure 2-5 Change to Tray Return Mode

Tap "Tray-Return" Mode"

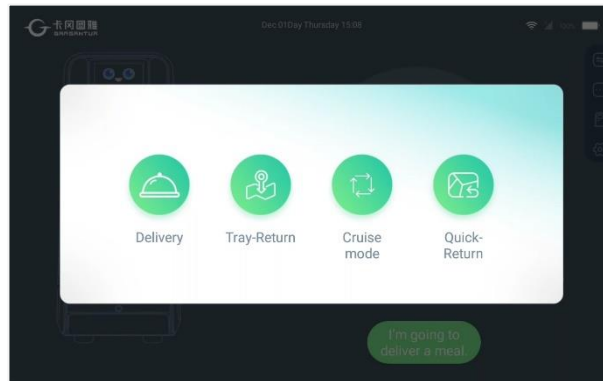


Figure 2-6 Choose Tray Return Mode

Select the table for tray return and tap "Go"

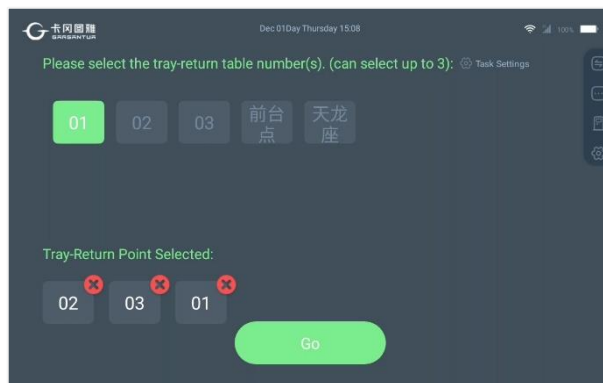


Figure 2-7 Choose the Table Needs Tray Return

Complete tray return

When the robot reaches the tray return position, it will provide a voice alert to remind the attendant to collect empty meal trays. After collecting the empty meal trays, the attendant taps "Recycle Complete". The robot automatically takes the meal trays to the cleaning point.



Figure 2-8 Arrived at the Table Needs Tray Return Point

Call for Delivery

In traditional restaurants, snacks and drinks are placed in a certain position, which is inconvenient for diners to fetch them. To improve the dining experience, you can place items in the robot's tray in advance, and diners can call the robot to deliver items to designated tables.

The robot will automatically deliver the items after the diners scan the code and return automatically after the diners confirm the pick-up.

Call for Tray Return

Currently, meal trays are mainly returned by the attendants or by the cleaning staff as requested by the attendants. GL-F3 redefines the tray return mode, where the robot is called by the diners or attendants to automatically return the meal trays and deliver them to the cleaning point.

Autonomous Path-Finding and Obstacle Avoidance

GL-F3 is equipped with SLAM localization and navigation, which, through pre-deployment, enables automatic navigation and path-finding, automatic obstacle and pedestrian avoidance, and accurate delivery of food, goods, and meal trays to the destination.

Multi-robot Collaboration

Multiple GL-F3 robots can work simultaneously in the same scenario. They synchronize information with each other, automatically avoid when they meet in narrow aisles, and queue up when picking up food, so as to complete their respective delivery tasks in an orderly manner.

Autonomous Recharging

The robot automatically checks whether the battery is sufficient during the tasks. When the battery level falls below a preset threshold, the robot will automatically return to the charging station for recharging and continue to work when fully charged.

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.

Cloud Management Platform

The Gargantua 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 accurate data models for restaurants, thus empowering them to improve overall operation capability and service quality.

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.

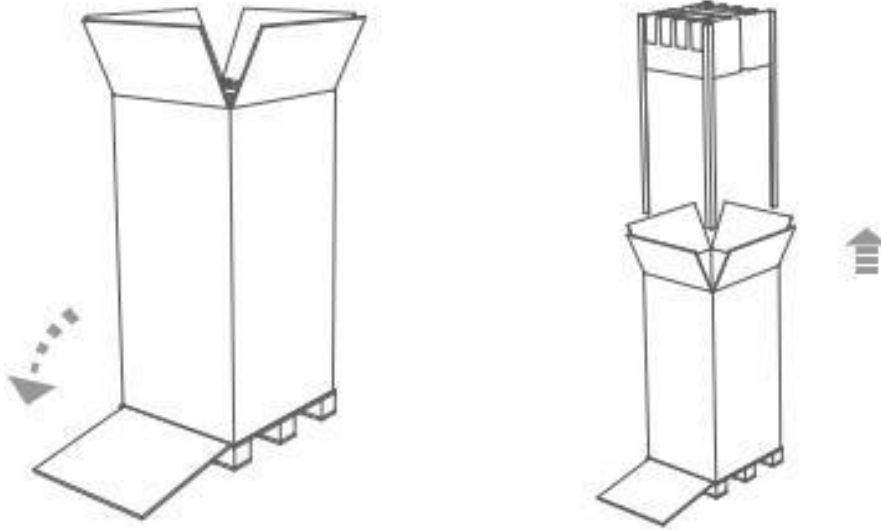


Figure 4-1 Remove the Packaging-Step 1

(3) Remove the packaging.

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

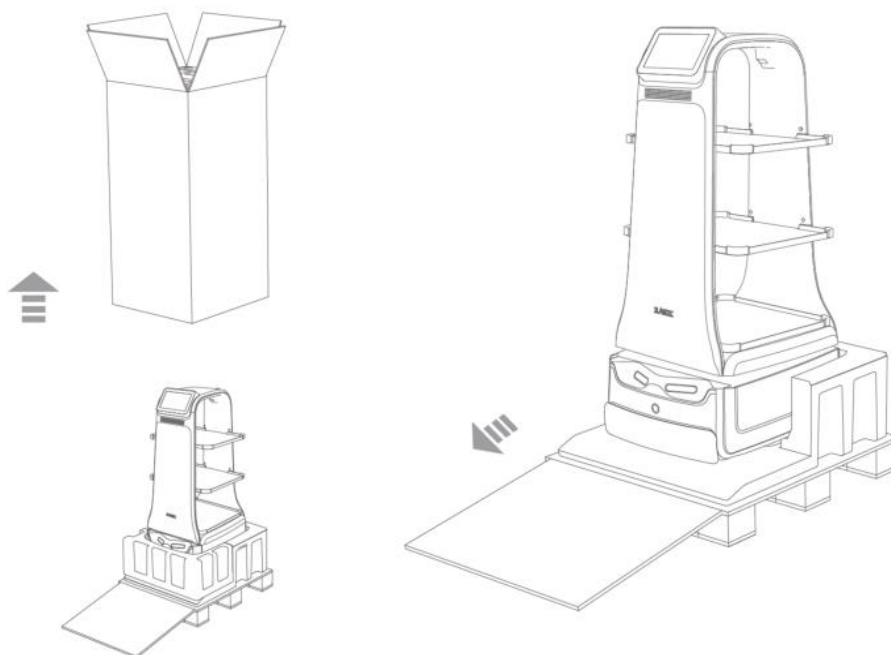


Figure 4-2 Remove the Packaging-Step 2

Position of the Charging Station

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.

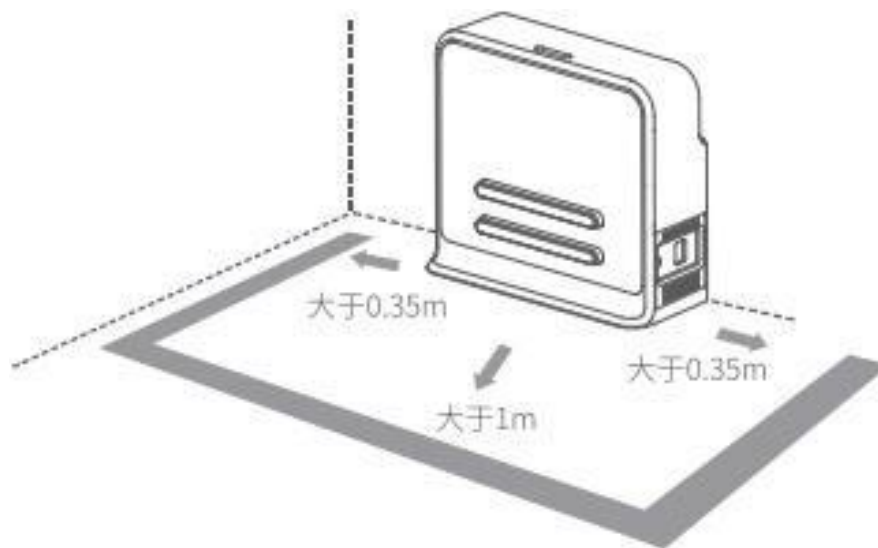


Figure 4-3 Position of the Charging Station

Power-up & Power-off

Power-up:

Long press the power switch until the power switch indicator lights up.

Power-off:

Long press the power switch until the power switch indicator goes off.

Notes: When you use the robot for the first time, place the charging station against a wall and plug it in, and make sure the power indicator of the charging station is green. Then align the charging port of the robot with the charging station. The robot will start automatically.

Initial Use

For initial use, please refer to the deployment instructions or contact the deployment technician.

Charging

Align the charging pad of the robot with the charging electrode of the charging station. When the front light band of the robot lights up, the charging process starts.

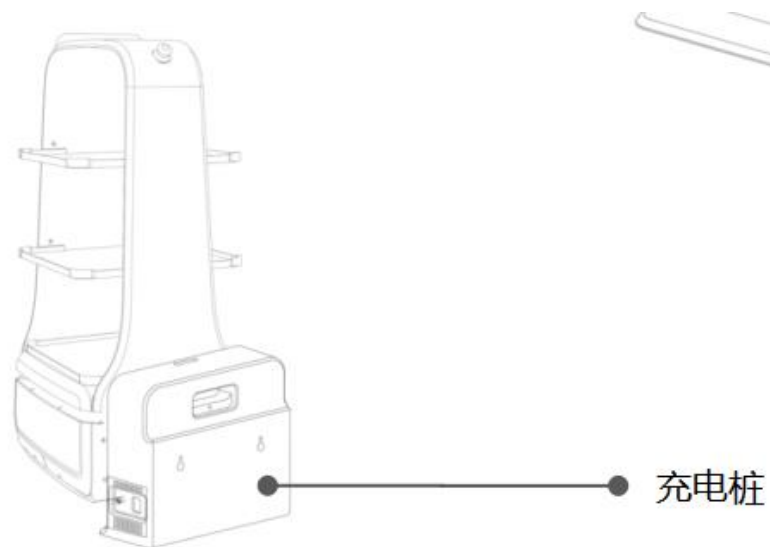


Figure 4-4 Charging

Emergency Stop



Figure 4-5 Emergency Stop Button

Emergency Stop Button

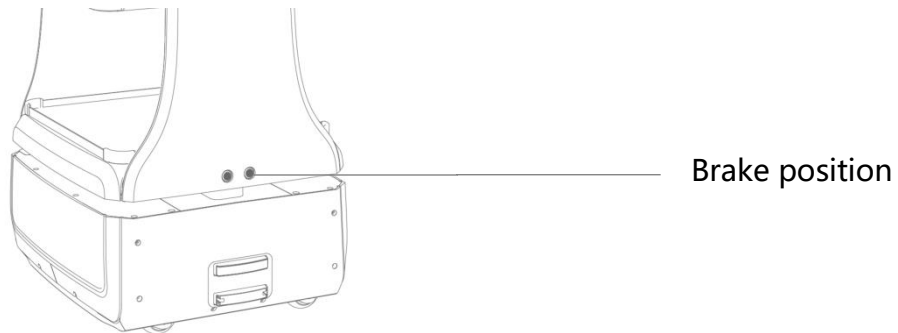
In an emergency, pressing the emergency stop button will immediately stop the robot and abort all motion control commands. Also, it is hard to push the robot manually.

Resume Operation

When the emergency stop button is rotated clockwise, the robot resumes operation and starts to receive new control commands and perform tasks.

Brake

Pressing the brake button with the finger will stop the robot, and pressing this button again will release the brake.



Debugging Port

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

General Maintenance

Charging station -- Use a soft dry cloth to wipe the charging station and charging electrode in the power-off state.

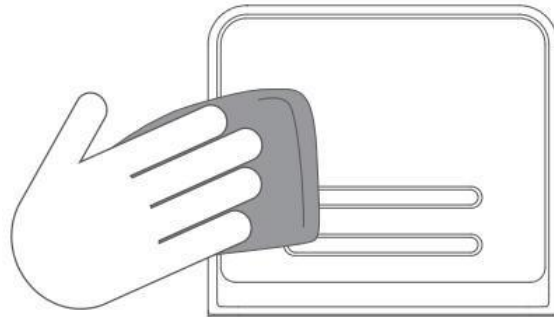


Figure 5-1 General Maintenance Step

Maintenance Frequency

Robot maintenance primarily includes tray cleaning , 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.

GL-F3 Maintenance Schedule			Interval			
Serial No.	Component	Maintenance Level	Year	Month	Week	Day
2	Depth sensors	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	--	--	--

Figure 5-2 Maintenance Frequency

Charging Station Deployment

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

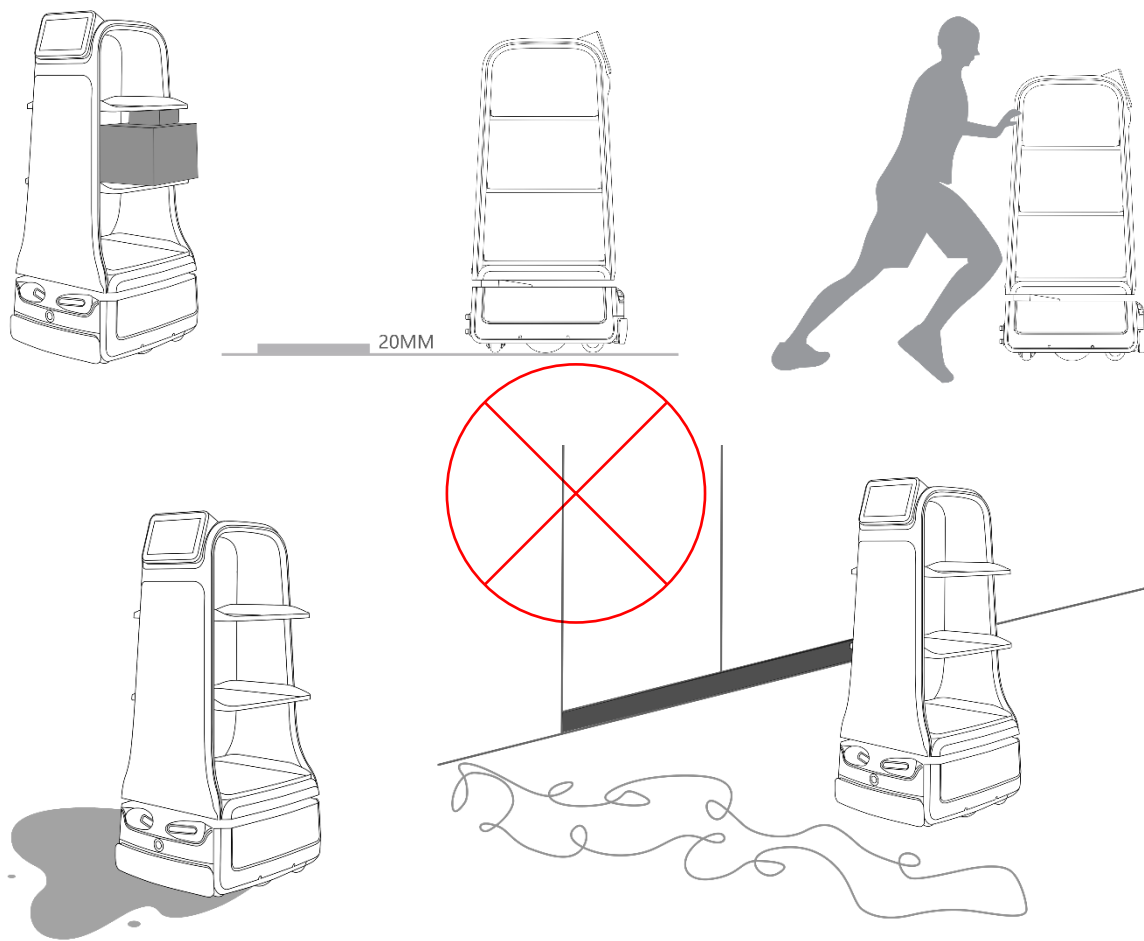


Figure 6-1 Scenarios Not for Robots

(1) Overloading transportation

Do not tray more than 10kg items in a single pallet.

(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.

(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) Outdoor use

Do not use the robot outdoors.

(7) Use the robot only at altitudes below 2000m.

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 matters. Do not push or hit the robot while it is carrying out its functions. Otherwise, the robot may malfunction.

Storage:

1. Store in a cool and dry environment.

2. Store in a dry and non-corrosive atmosphere at room temperature of 10-25 degrees.
3. In long-term storage, the robot should be charged once every 6 months.

Transportation and handling:

Handle with care to prevent falling, bumping, dragging and upside down.

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	Low power	press the brake release button, and push the robot back to the charging station for charging.
3	Charging failure of robot	1) Check whether the power cord plug of the charging station is inserted into the socket and whether the charging station indicator lights up normally. 2) Push the robot to the charging station, contact the after-sales service.
4	System crash	Push the robot to the charging station and try to restart the robot.
5	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.
6	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.
7	Other faults	Push the robot to the charging station, contact the after-sales service.

Figure 7-1 Troubleshooting Lists

Date	Version	Description
2022-12-01	1.0	Initial Version

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