

successively with the left mouse button to drive into the area. After creating, click the right mouse button to automatically connect the starting point and the end point to form a closed polygon box.

### Start Point



Function:

Start point of automatic route

Usage method:

Cooperate with polygon,

- ① Click anywhere in the polygon (the point setting cannot be too close to the border);
- ② Select "Startpoint" and click on the map's driveable route to set the startpoint;
- ③ Then, select the button "Select" and click "Startpoint" in the map to move the position of "Startpoint" or drag the arrow above "Startpoint" to adjust the direction.

### Eraser



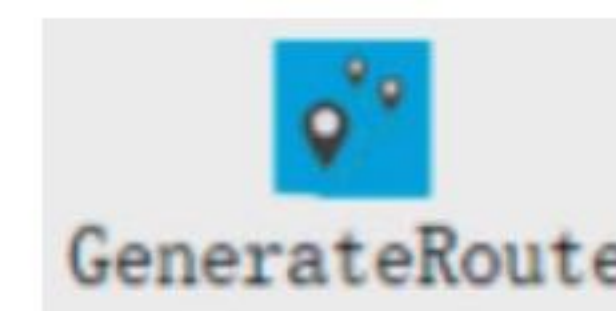
Function:

Erase

Usage method:

After selection, press the left button mouse on the temporary obstacle to erase. (for example, a person who walks around during the scanning process).

### Generate Route



Function:

Generate route points

Usage method:

Cooperate with polygons and automatic route starting points,

- ① Create "Polygon" and "Initpoint" in the map;
- ② Click this automatic route generation point to automatically generate a route according to the starting point of the automatic route as the starting position.

### Measure



Function:

Measure the length of the route

Usage method:

After selection, click the left mouse button to pull, release the left



mouse button to stop, and then the route length can be measured.

### Route Point



Function:

Manually plan route locations

Usage method:

After establishing the startpoint on the map, select "RoutePoint" and click successively on the map to create the right route.

#### Caution:

The first route point shall cover the startpoint, otherwise, the machine cannot execute the route normally.

### Rotate Right



Function:

Rotate map in right direction

Usage method:

Click "RoateRight" to rotate the map in right direction by a certain angle.

### Rotate Left



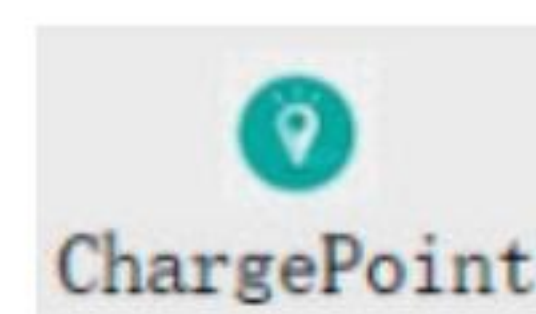
Function:

Rotate map in left direction

Usage method:

Click "RoateLeft" to rotate the map in left direction by a certain angle.

### Charge Point



Function:

Automatic charging point of machine

Usage method:

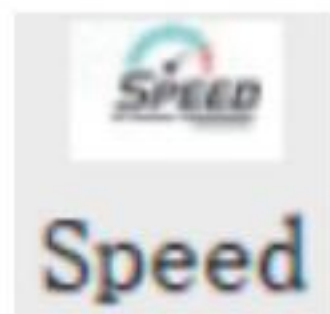
- ① Select the icon of "ChargePoint" and click the left button of mouse to create a charge route in the area where "ChargePoint" needs to be created;
- ② Click the right button of mouse to end the creating of charge route (the position where the right button of mouse ends is not counted);
- ③ After clicking "Save", ChargePoint will be saved to the route file.



Note:

1. The automatic charging point of machine shall be equipped with Water supply and drainage station.
2. Under the same route, there can only be one available between "ElevatorPoint" and "ChargePoint" .

## Speed

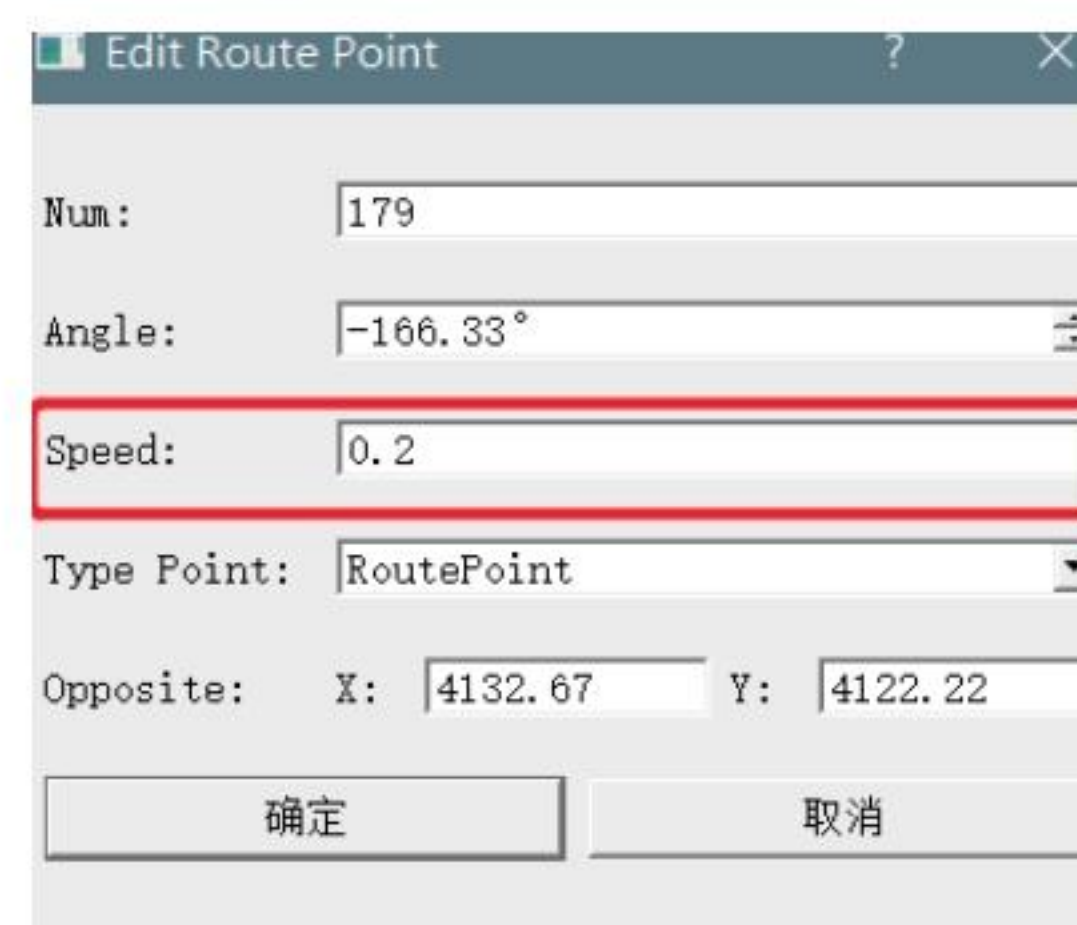


Function:  
Adjust speed

Usage method:

- ① Click "Select" to select the point to be adjusted, click the button "Speed" to fill in the data (the maximum speed is 0.6), click "OK" and "Save" , and the route point speed will be changed;

- ② Double click the "Route Point" to show the details information of point, and the route point dialogue box will be showed. You can modify the speed directly on route point;



- ③ After selecting multiple route points by "Select" box, click "Speed" to modify the speed .

## Turn Point



Function:  
Deceleration

Usage method:

After creating the route, click "TurnPoint" to generate the route based on the current route\_ Turn route file, including deceleration point.

## Updown



Function:  
Map download

Usage method:

After connecting with machine's network, click the "connect" , right part in dialogue box, and then select the right map, afterwards click the right button to download. Finally, you can download the required map to the engineering software.



## UpCloud route



Function:  
UpCloud route

Usage method:

- ① Click "connect" on the right to display the machines bound on the cloud platform. Select the required machine, right-click and click "Select" to select the machine;
- ② Find the right map on the left, right-click upCloud, and the success dialogue box will show, which indicates that the UpCloud is successful.

## Elevator Point



Function:  
Control the machine's up and down on elevator

Usage method:

- ① Select the icon of "ElevatorPoint" ;
- ② In the area where the "ElevatorPoint" needs to be created, click the left button of mouse to create an elevator control route;
- ③ Double click the drawn elevator line to show the dialogue box for filling in the floor. The top is the starting floor (namely the current floor) and the bottom is the ending floor (namely the floor number selected after the machine enters the elevator);
- ④ After clicking "Save", "ElevatorPoint" will be saved to the map file.

Note:

1. Under two points and one line and the same route, there is only one is available between "ElevatorPoint" and "ChargePoint" .
2. The data format of "ElevatorPoint" is "x, y, angle, floor number, ElevatorPoint" .

## Time



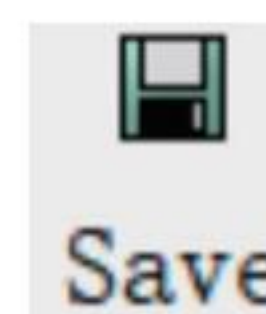
Function:

The temporary stopping point of machine, which supports setting the machine to stay at a specific point for a period of time and make operations.

Usage method:

Click "Select", select the point you want to stay, click "Ttime", enter the stay time at designated area and click "Save" to save the point.

## Button "Save"



Function:

Save current route

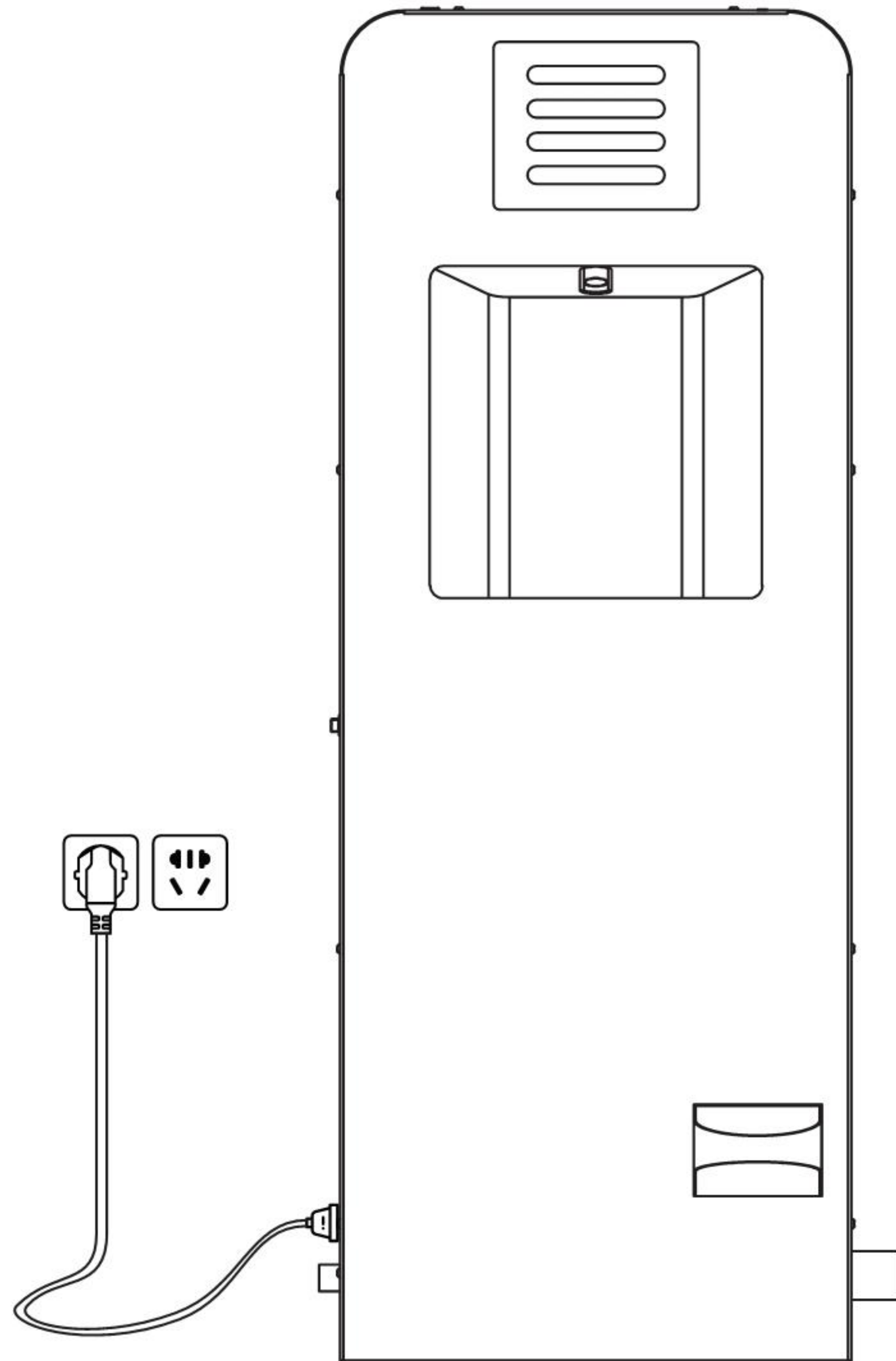
Usage method:

After creating the route, click "Save" to save the current route.

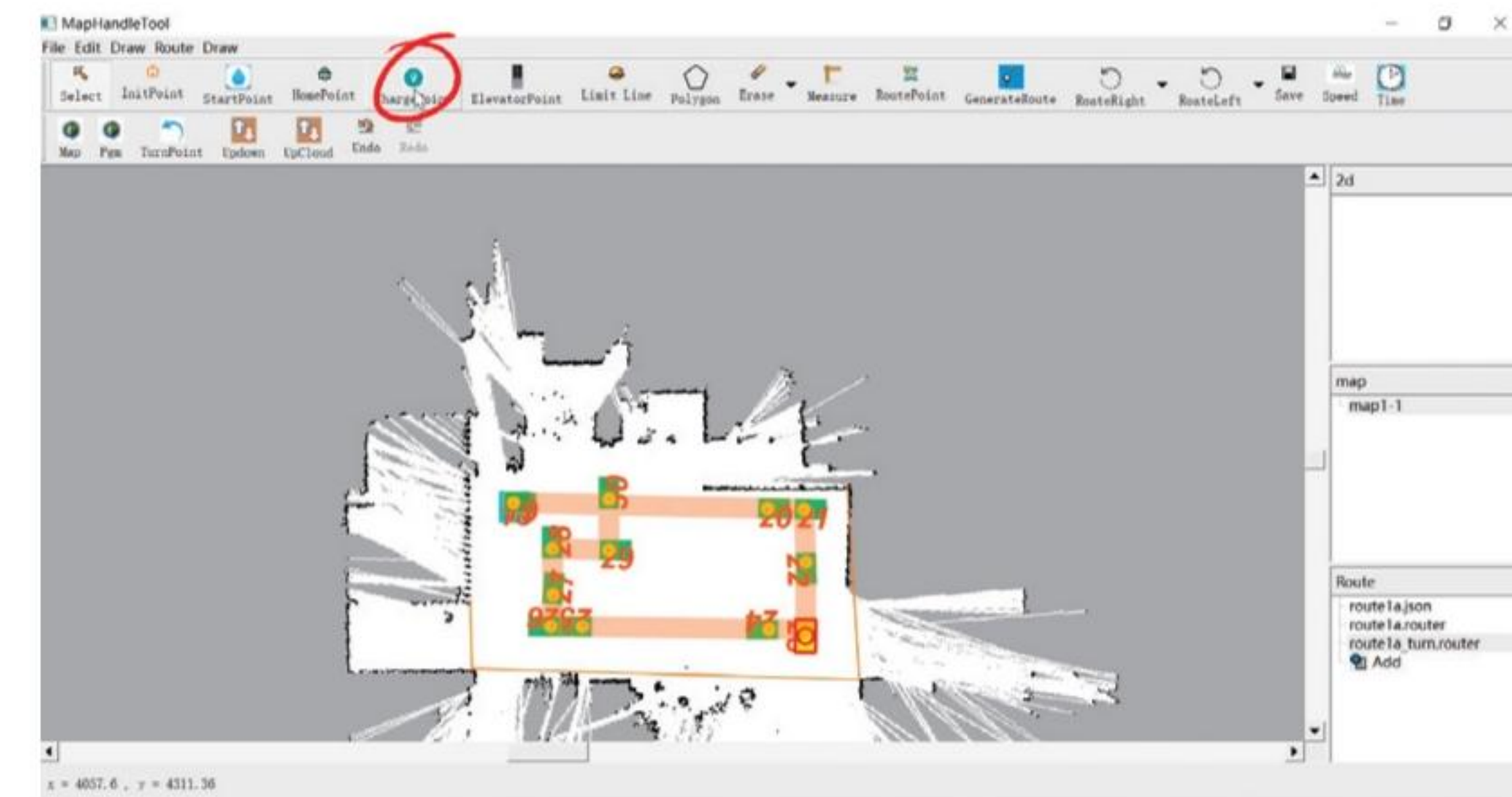


## Deploy charge point (optional)

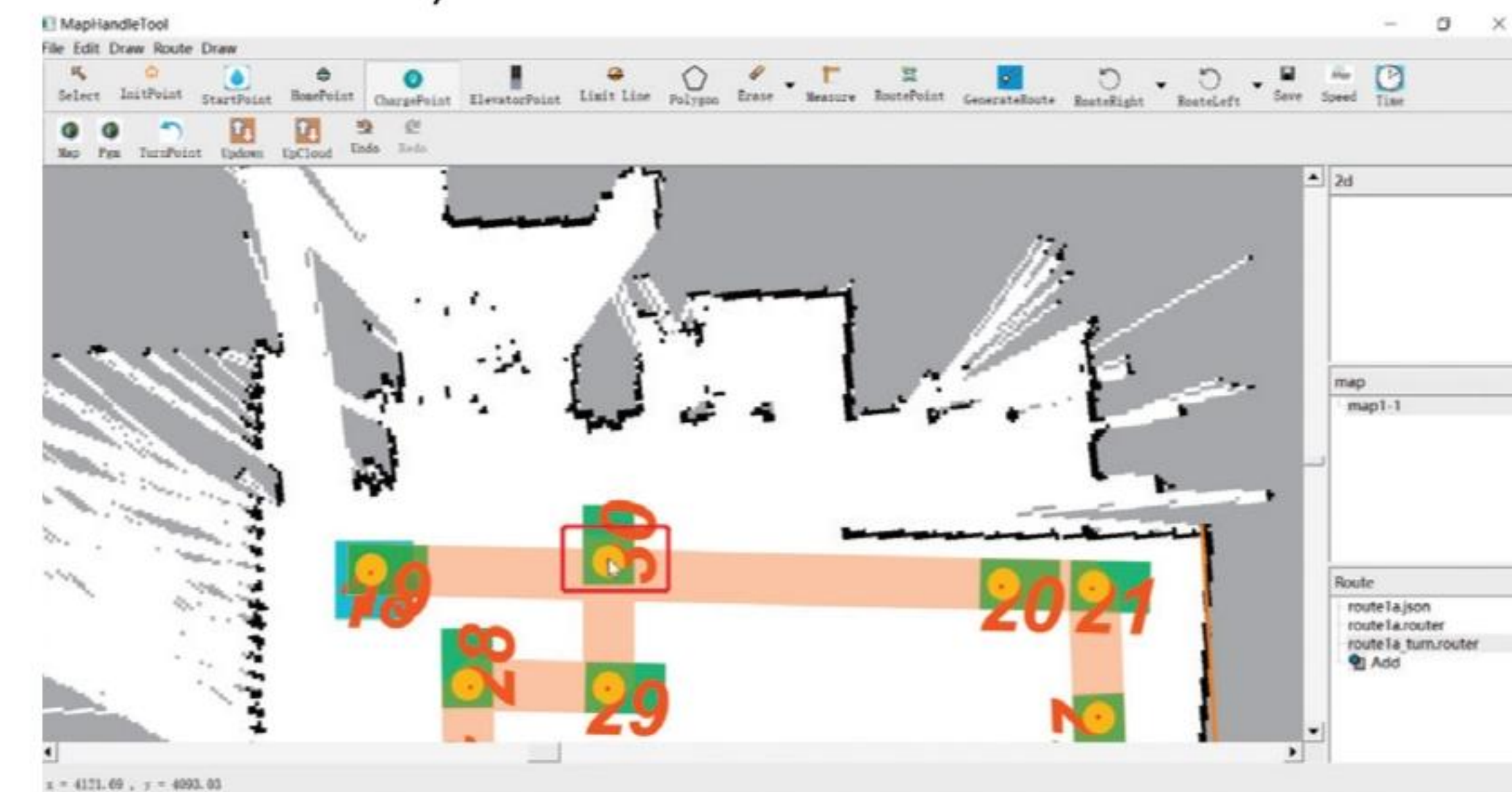
- 1 Connect the station to the power supply;



- 2 Open the map drawing software, select the path under the corresponding map, and click ChargePoint;

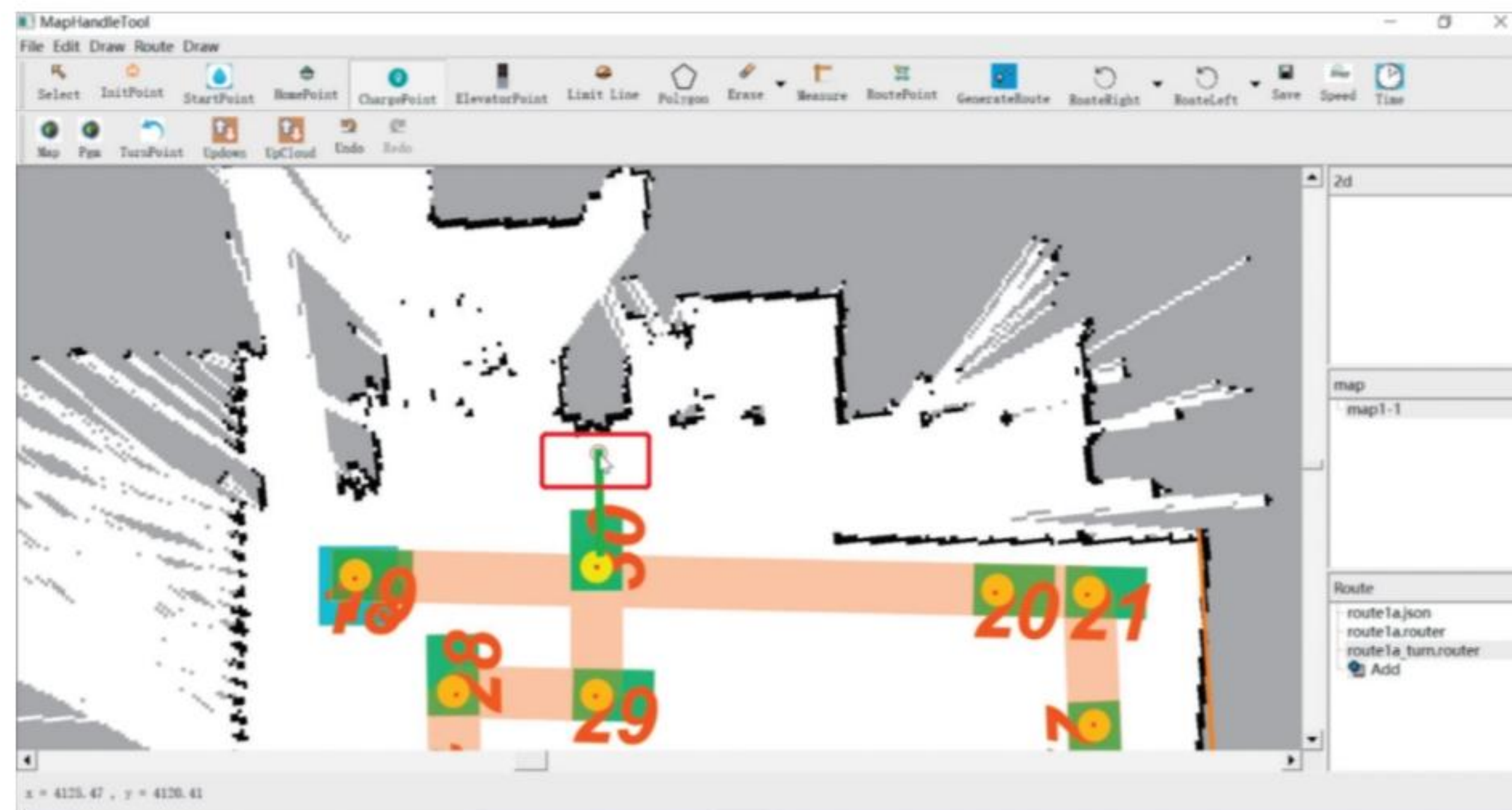


- 3 Click the center of the final point of the right route on the map with the left button of mouse, and drag the mouse, a green line will show;

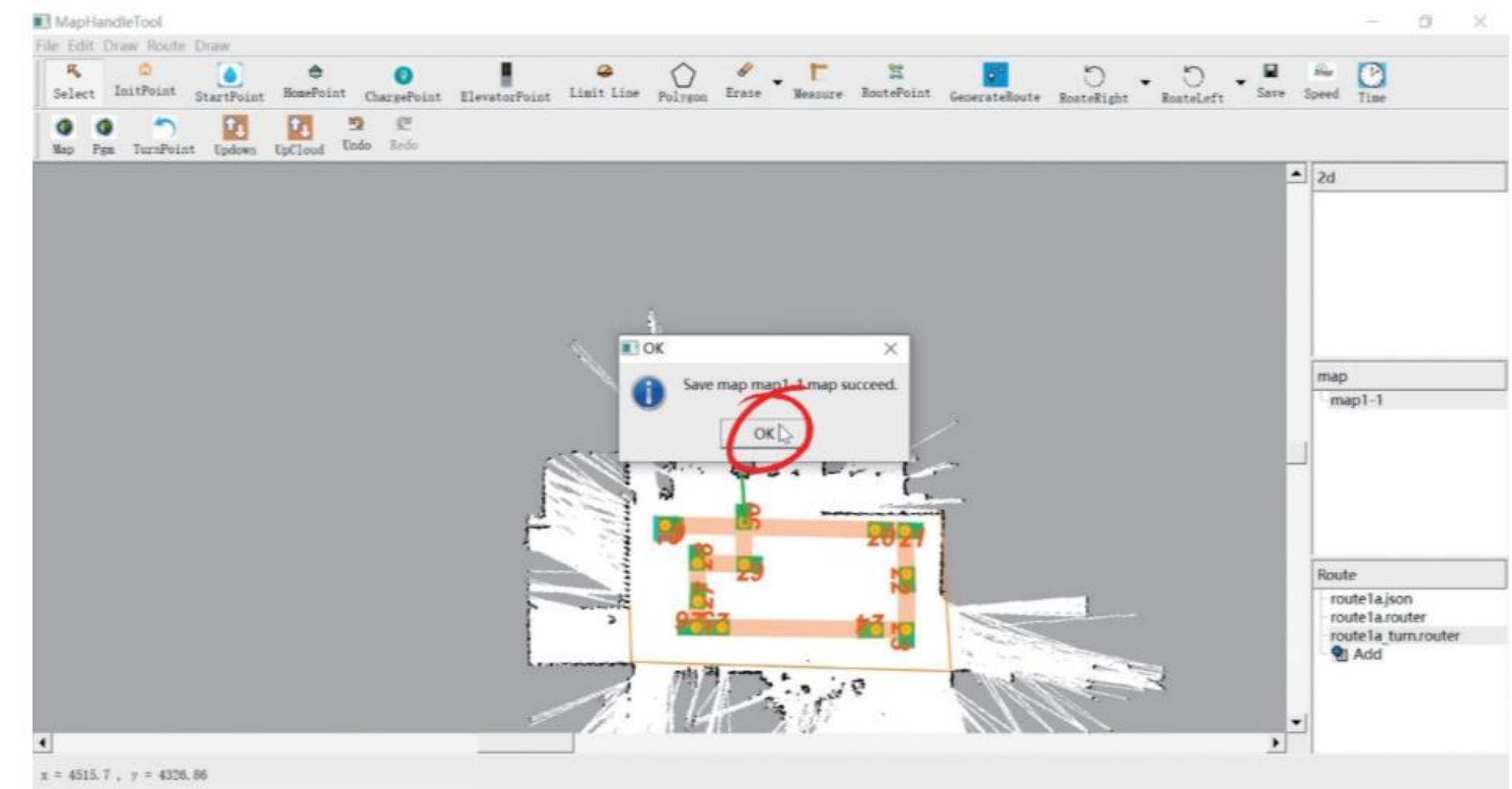




- 4 Click the left button of mouse to set the corresponding station point in nearby (the point shall be consistent with the actual location of station), and then click the right button of mouse to complete the setting;



- 5 Click the button "Save" in the upper right corner. After showing dialogue box, click "OK" to save finally.



## Add tasks

### Add common tasks

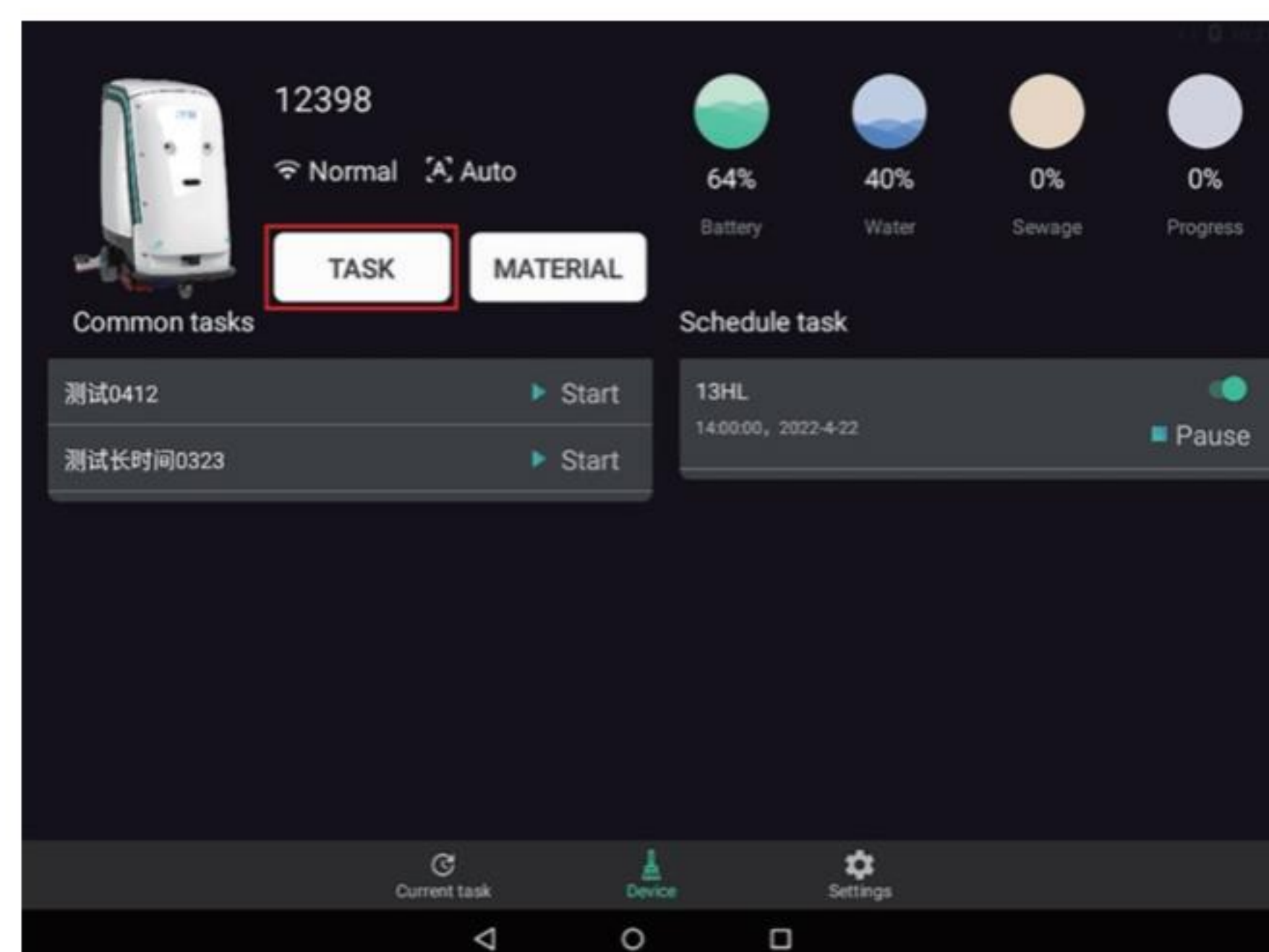
Q:What is a common task?

A: Common tasks represents the tasks that need to be manually opened by user.

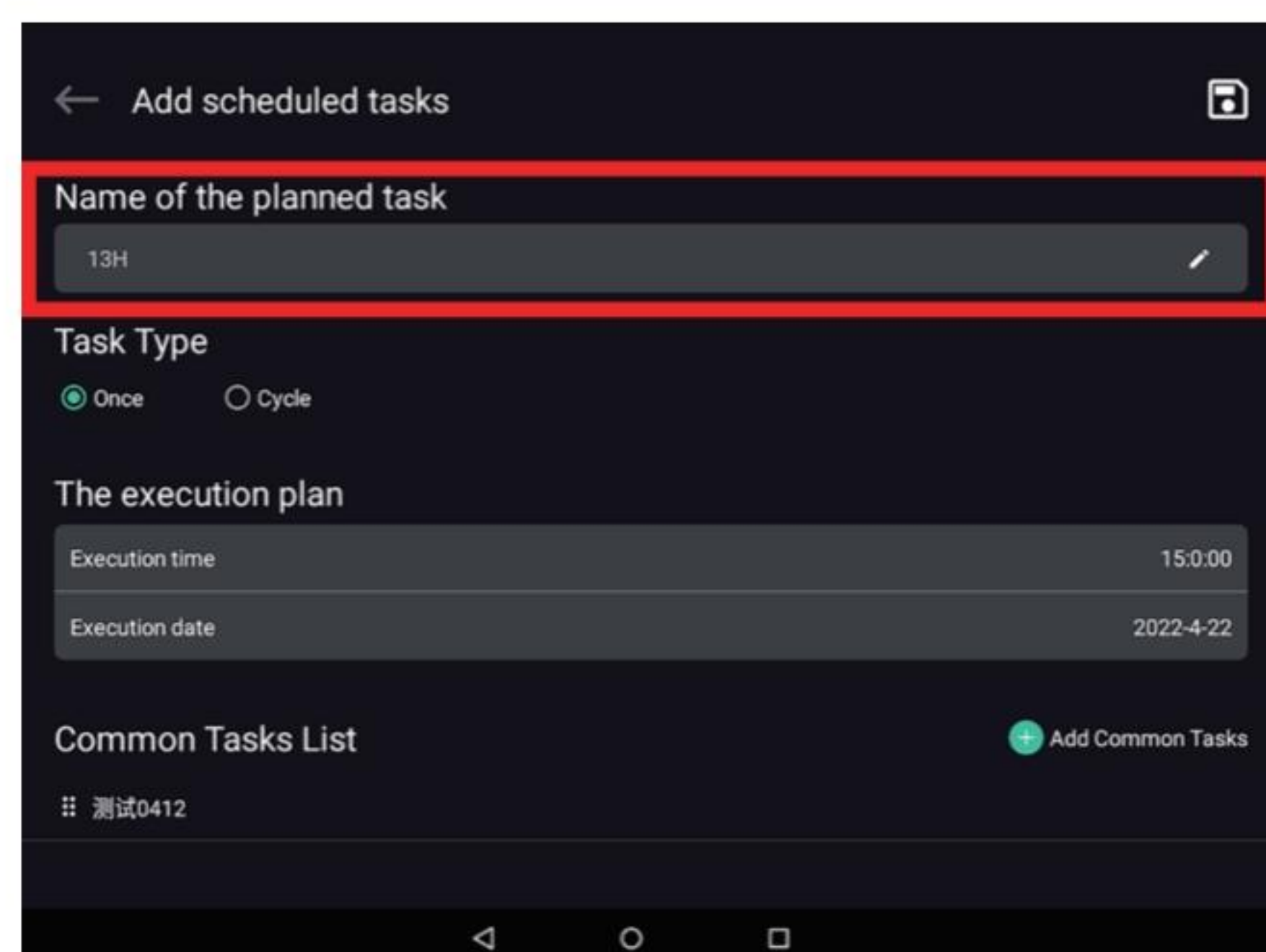
How to add a common task?



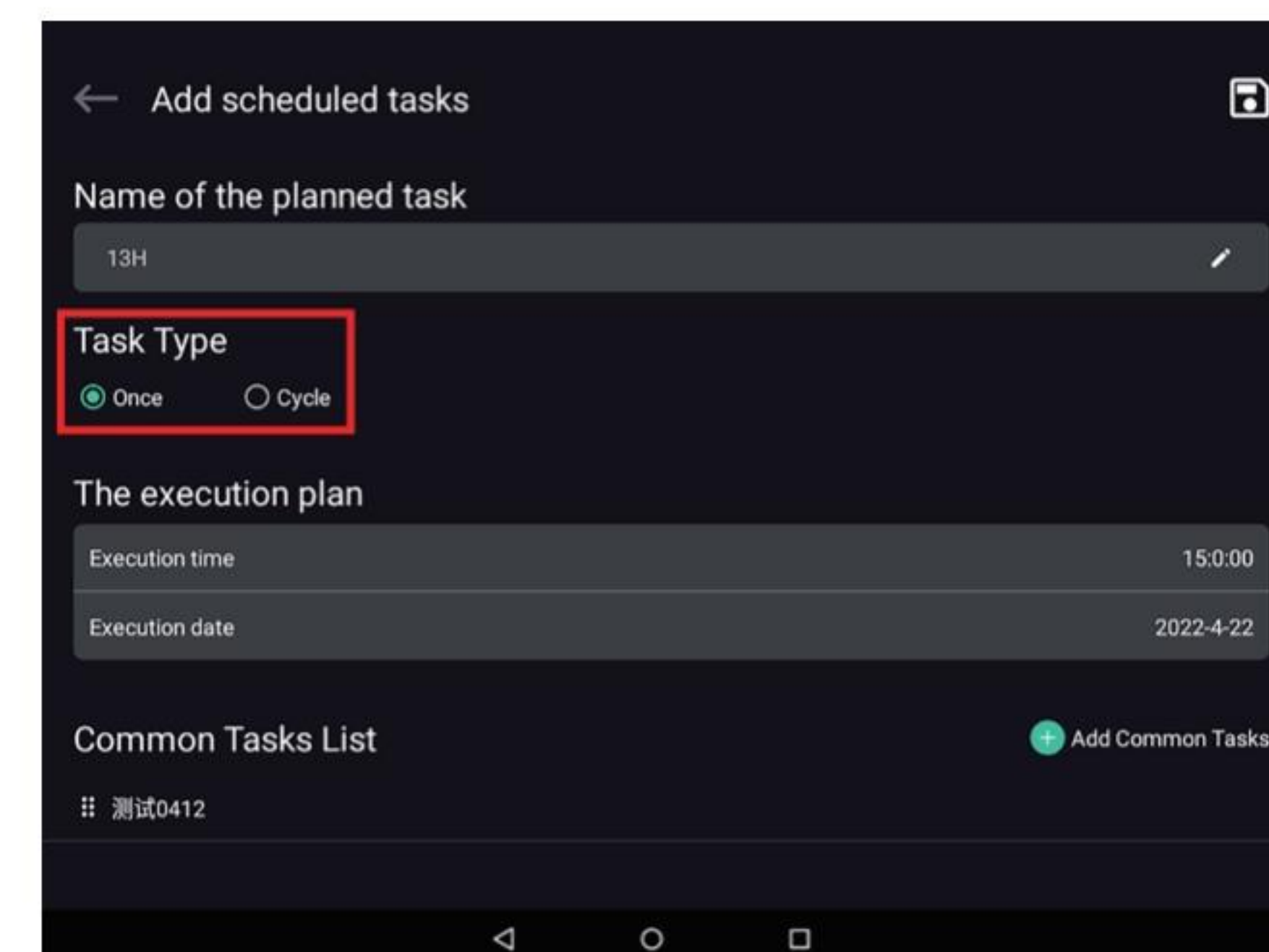
- 1 In the main interface of machine, click the button [TASK];



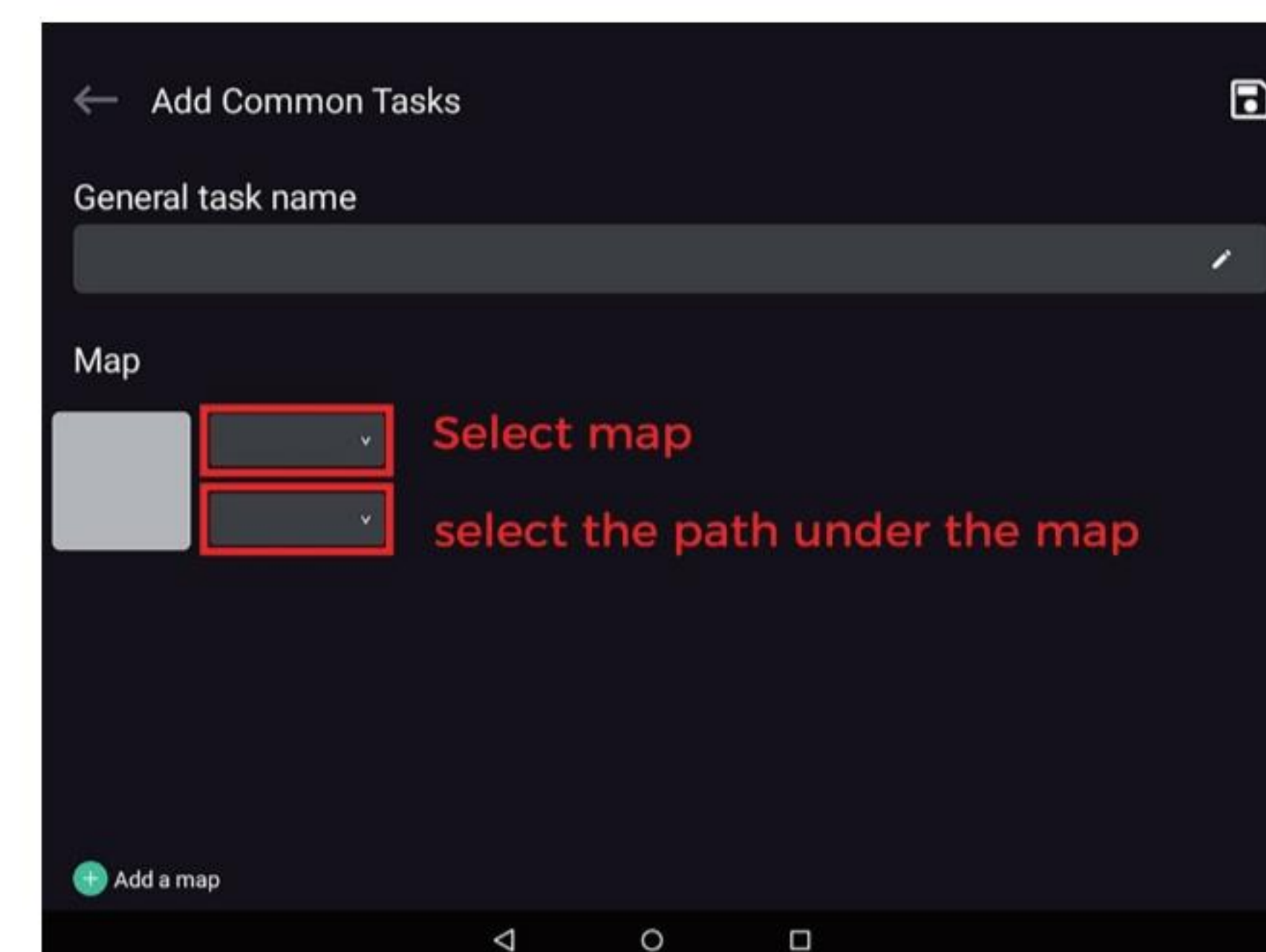
- 2 After entering the interface of "Task Management", click "Add a Common Task" ;



- 3 Enter the name for a common task;



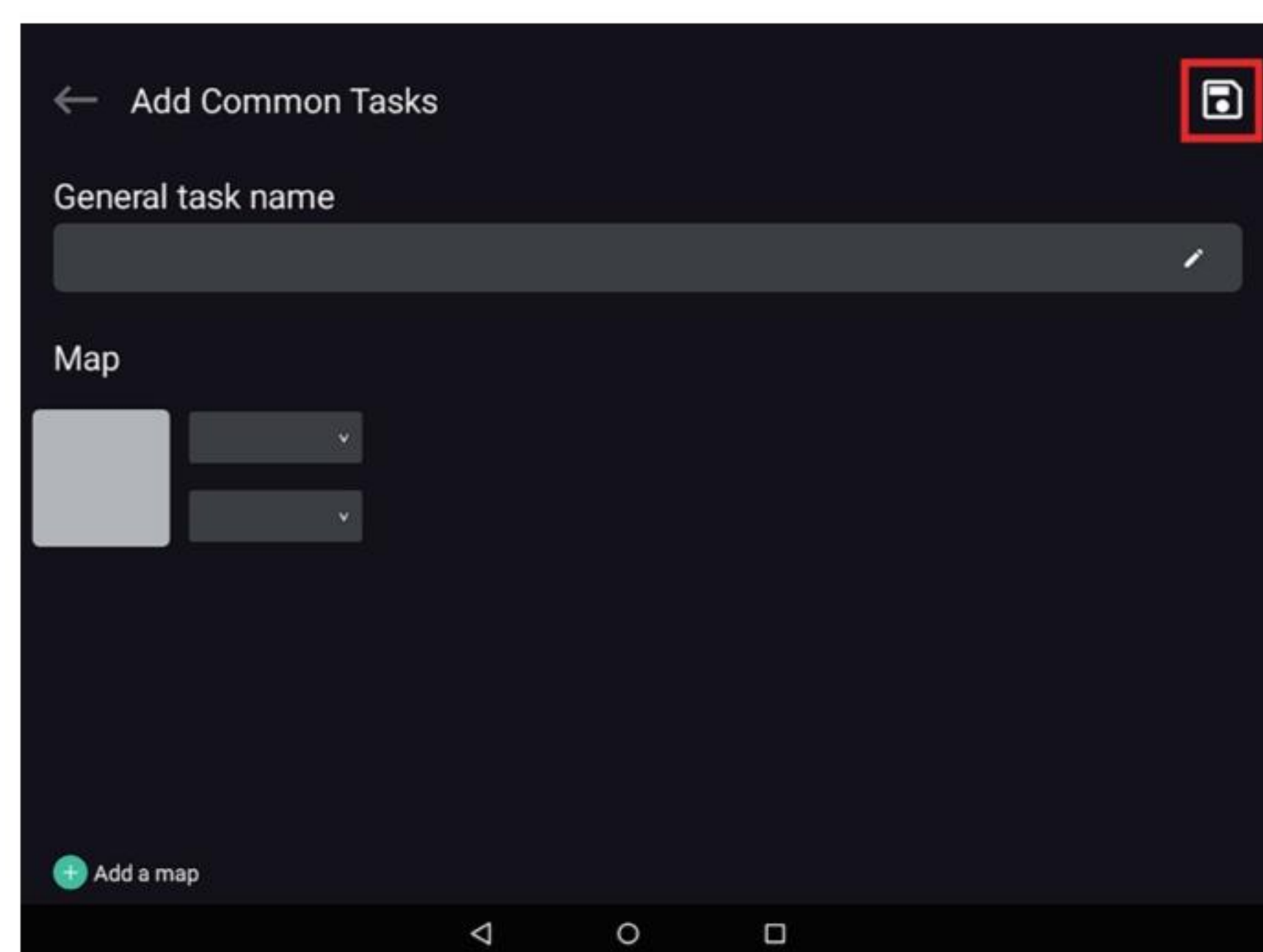
- 4 Select the right map and route;





Note: Adding a map can only be available in cross map scenarios. In the cross map scenario, the end point of route of the previous map must coincide with the start point of route of the next map, otherwise the machine cannot carry out cross map operation.

- 5 Click the icon "Save" in the upper right corner to successfully add common tasks.



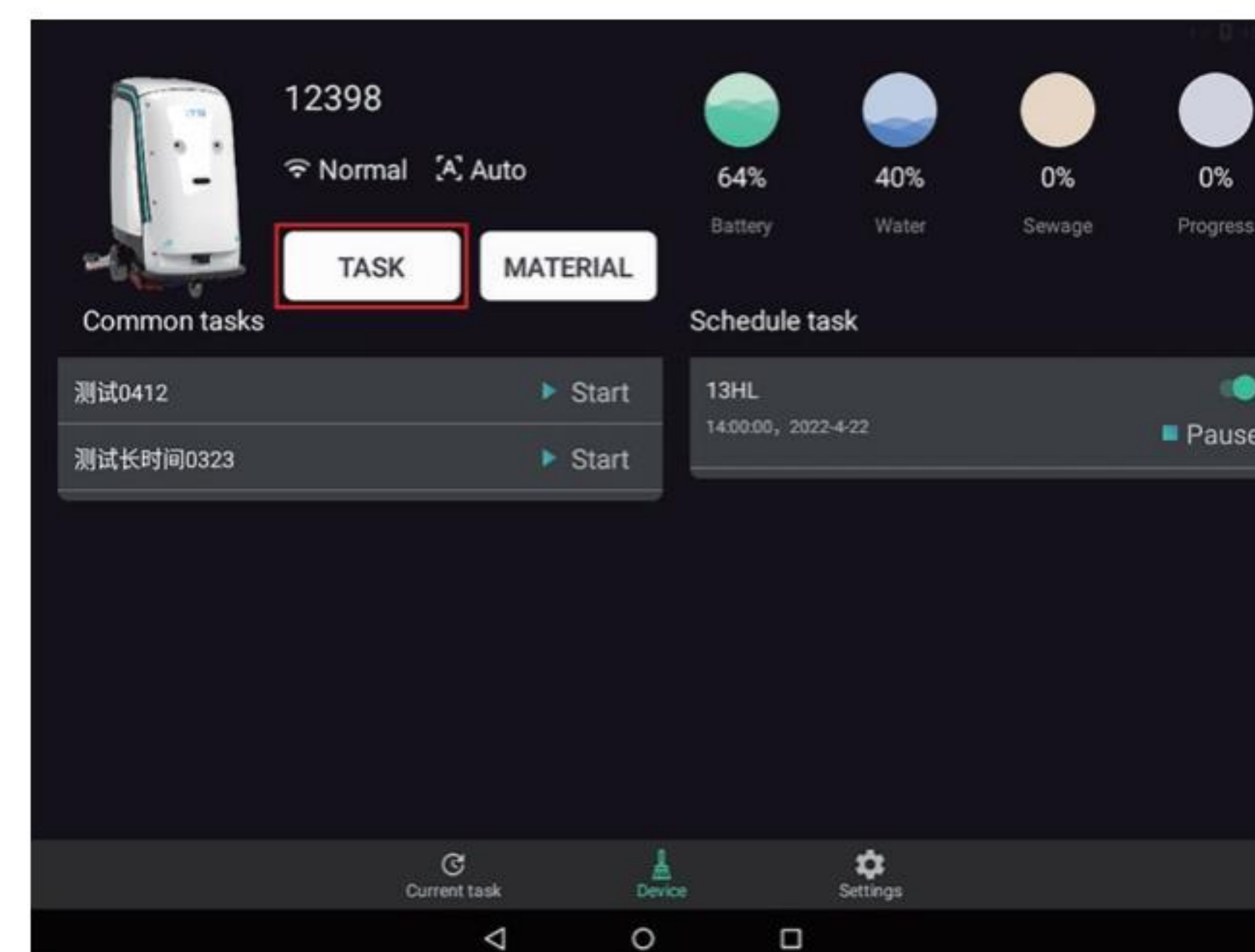
## Add schedule task

### Q:What is a scheduled task?

A: In the power on status, the user does not need to manually click the button [Start], and the machine can automatically clean the schedule task at fixed time and point.

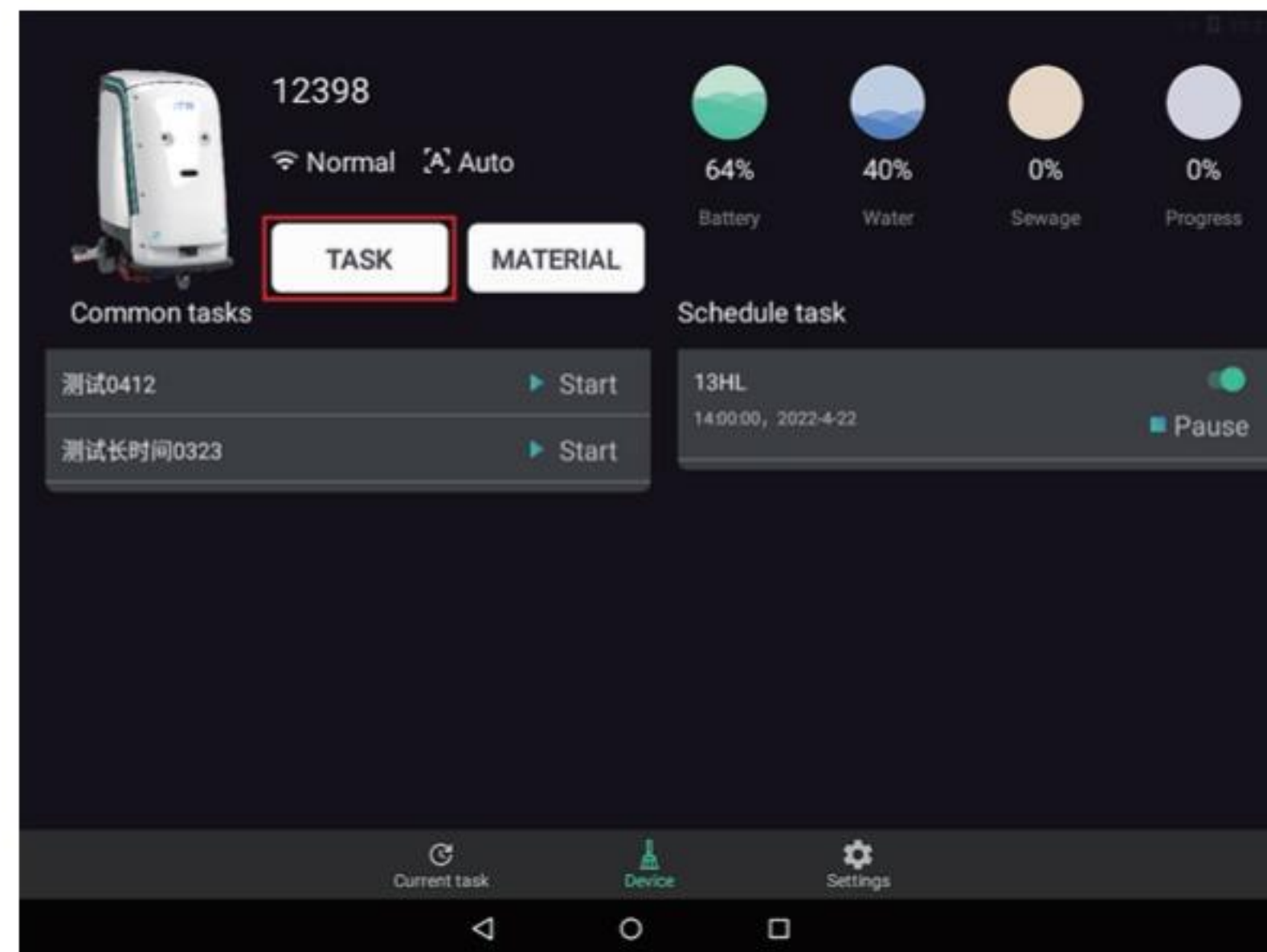
### How to add a schedule task?

- 1 In main interface of machine, click the button [TASK];

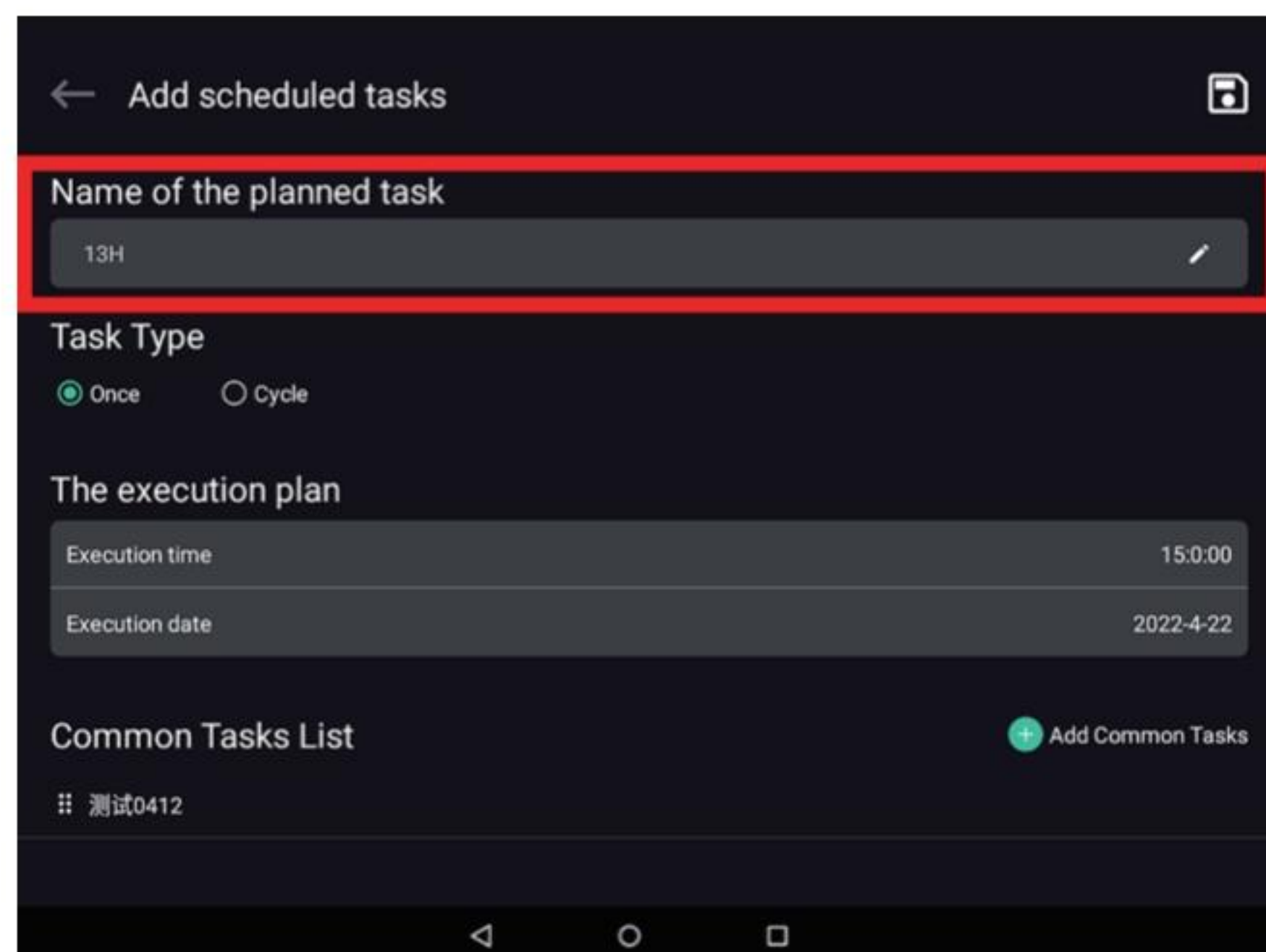




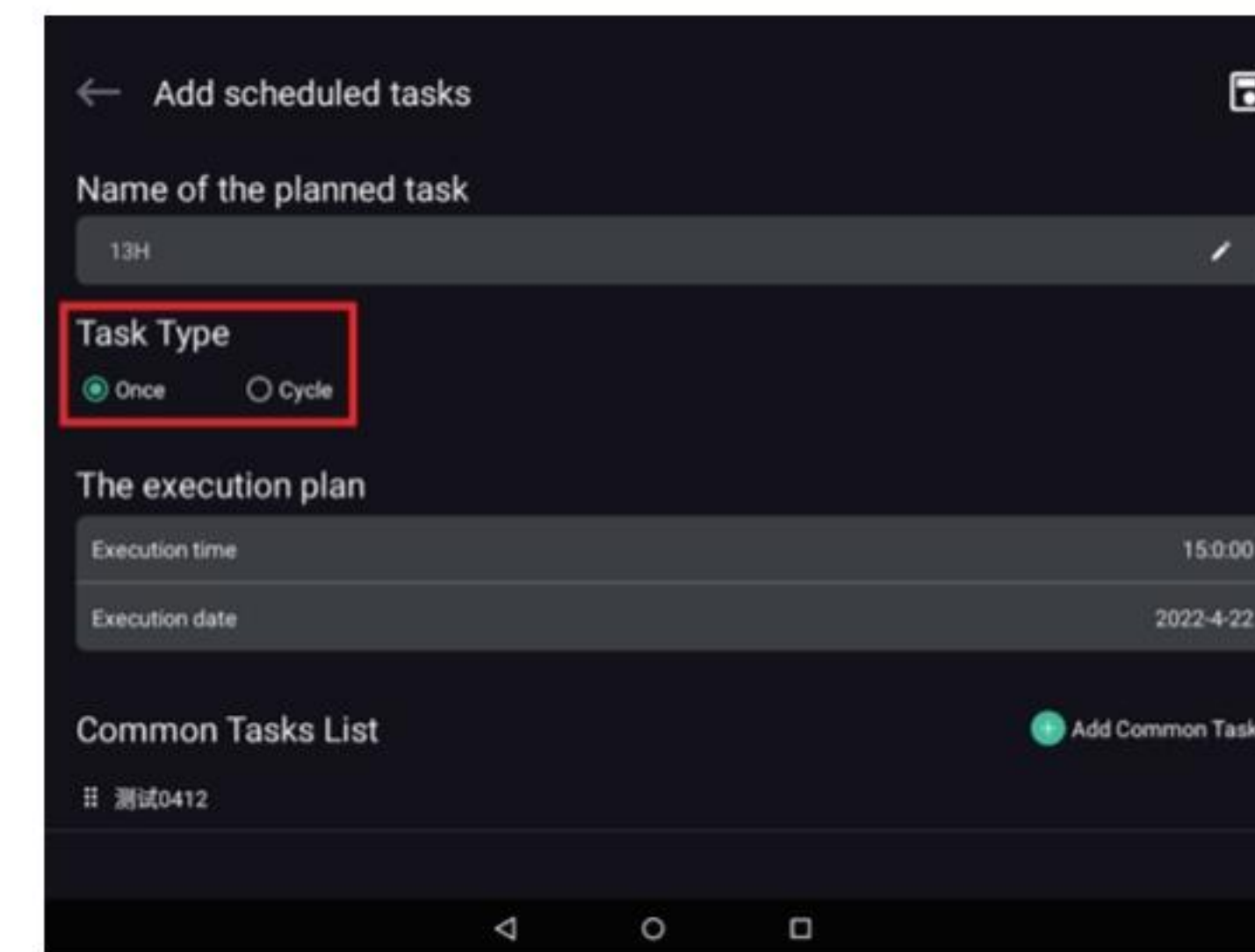
- 2 Then click [Add scheduled tasks];



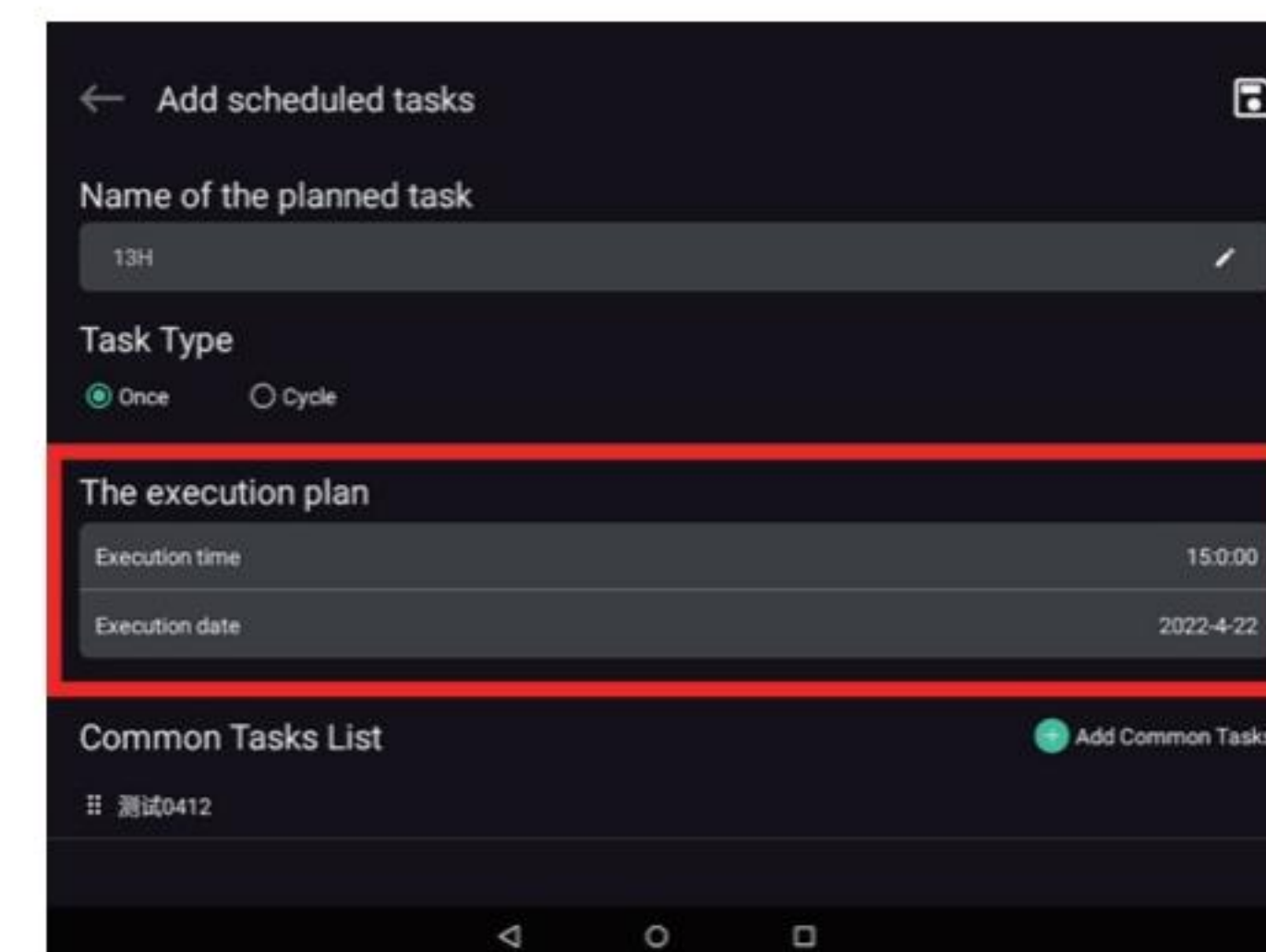
- 3 Enter the name for schedule task;



- 4 Select the type of task.  
Once task means the schedule task will be started only once;  
Cycle task means the schedule task will be started in "Execution Time" in each [Execution date];

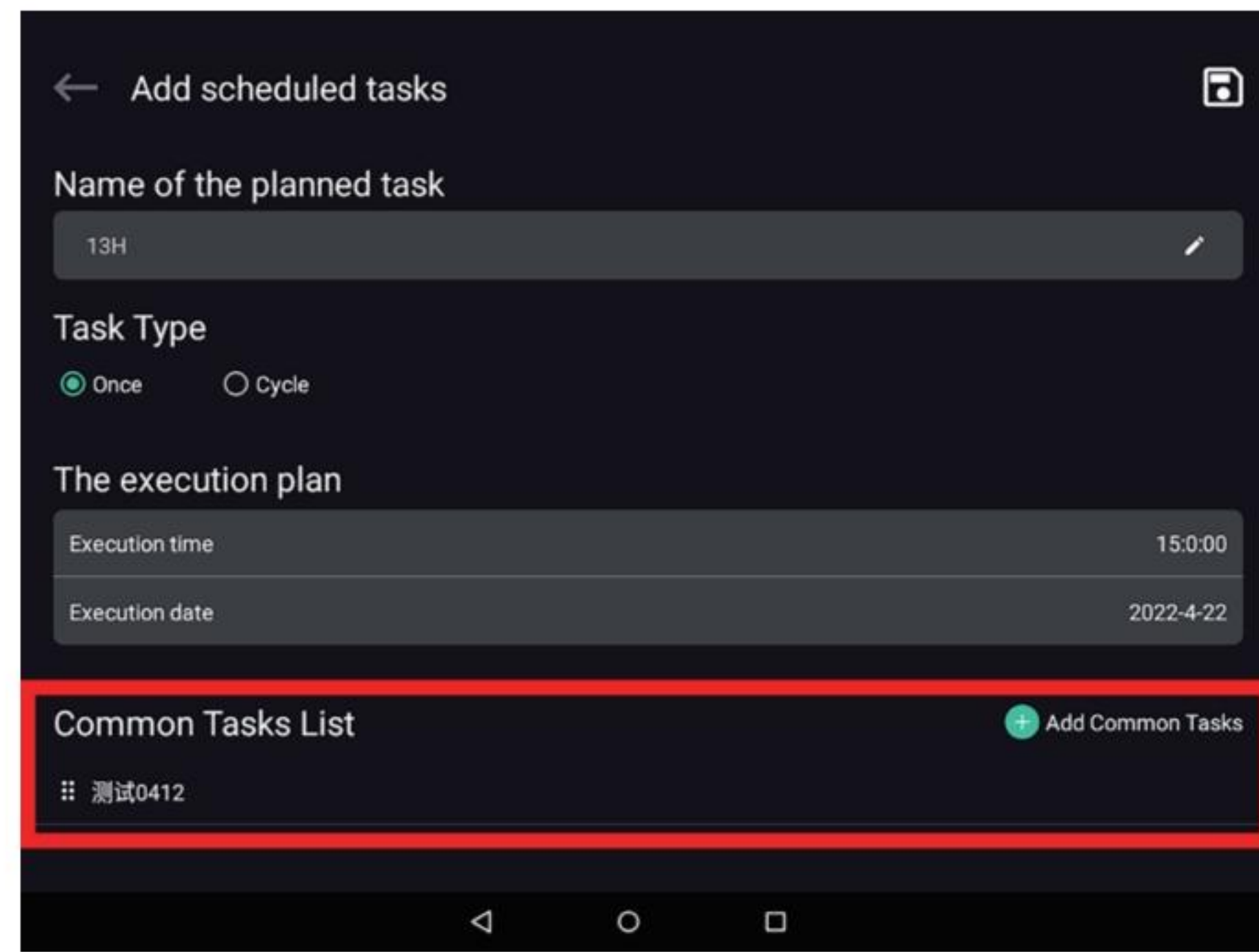


- 5 Select the execution plan.  
Execution time means the specific time node, like 13:00, which is a single choice;  
Execution date means refers to the specific date of the week, like each Monday and each Wednesday, multiple choices;

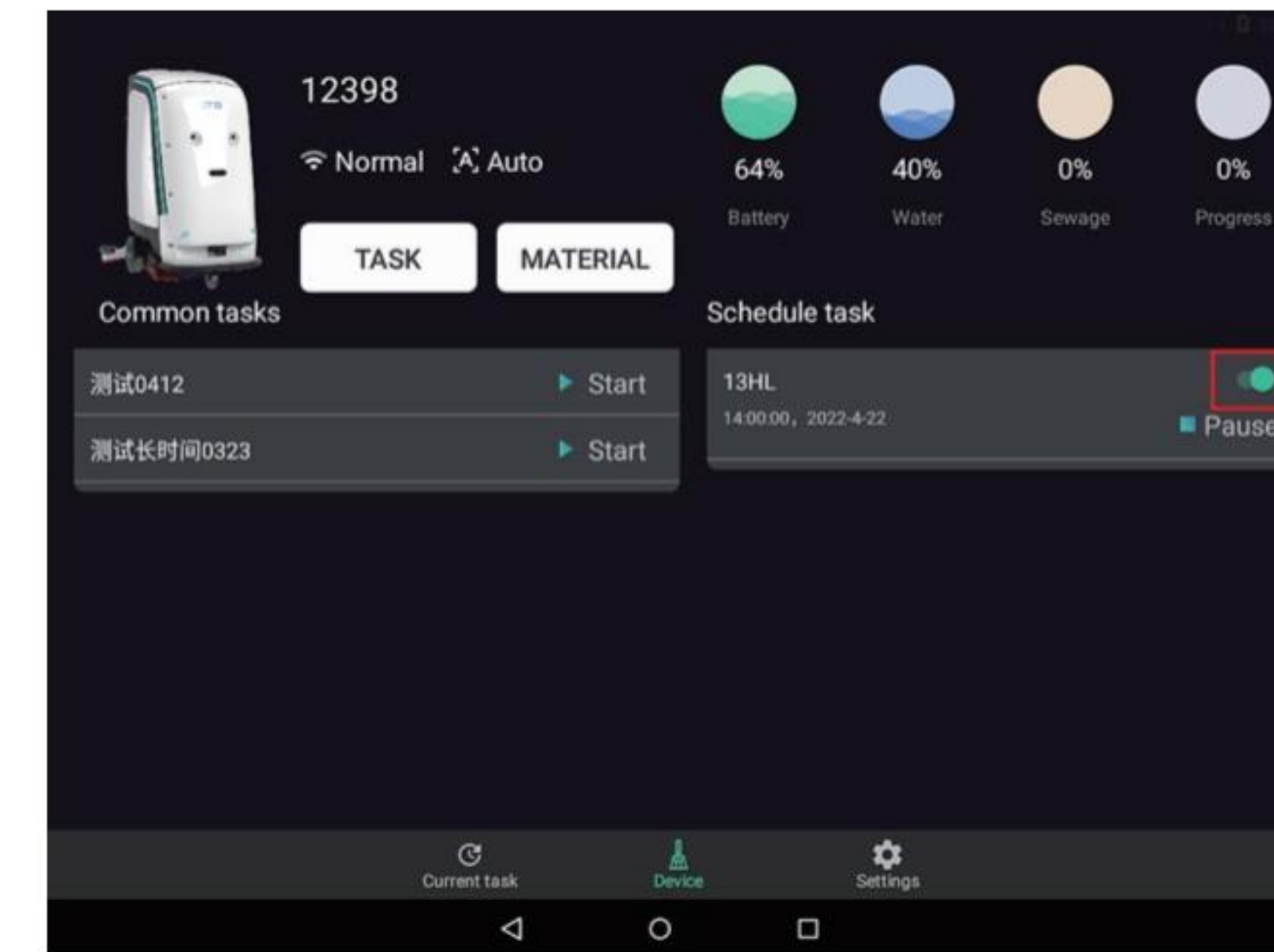




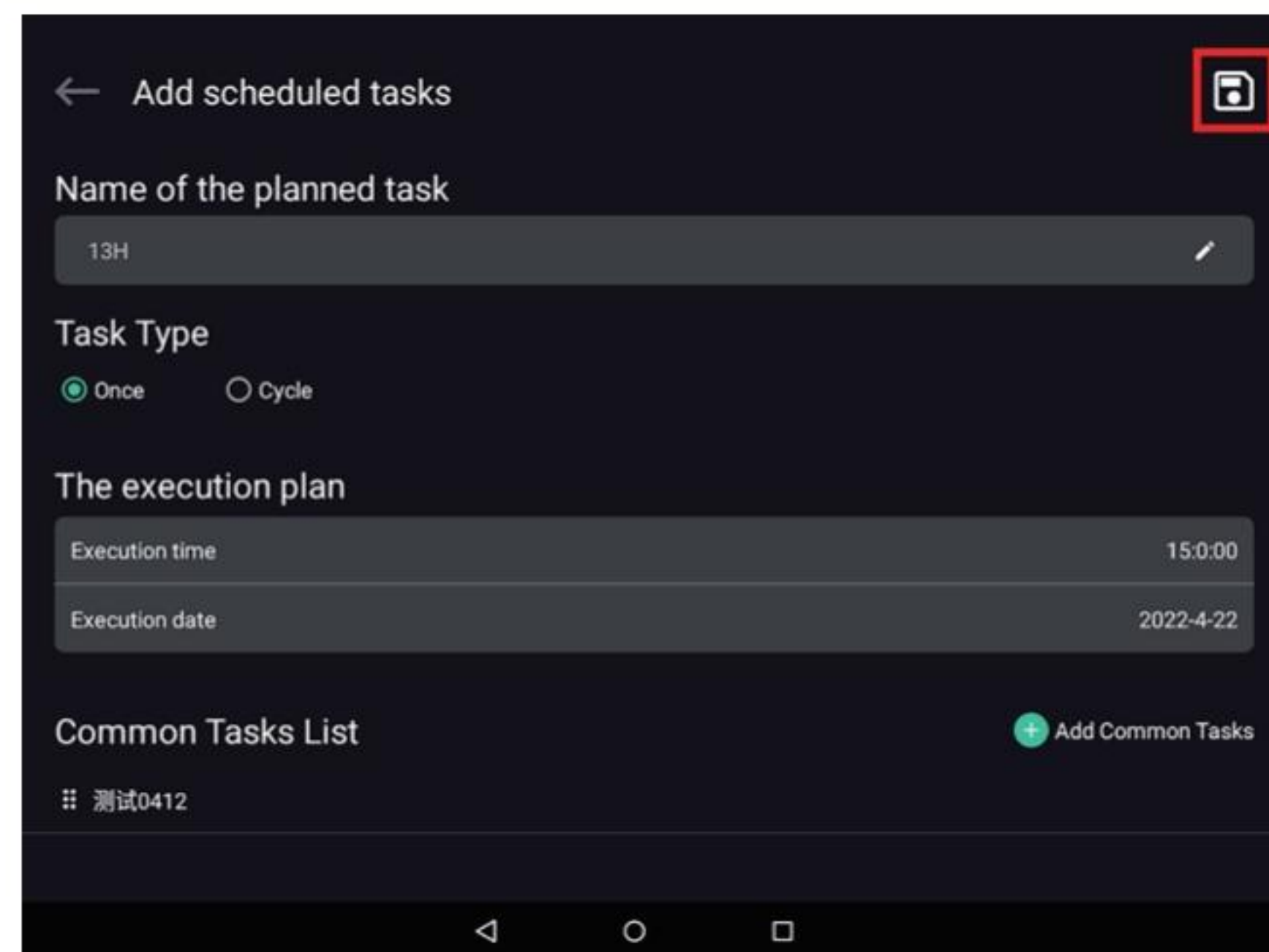
6 Add right common tasks;



Note: after adding the schedule task, click button “Start” on machine’s interface to start it.



7 Click the icon “Save” in the upper right corner to successfully add the schedule task.





## Power off

Please power off the machine in time after completing the task.

Key power on button shall be turned counterclockwise until the power key is off.

Fingerprint button and common button shall be pressed by the power button for two seconds until the power button is off.



# Operations of machine

## Start automatic cleaning

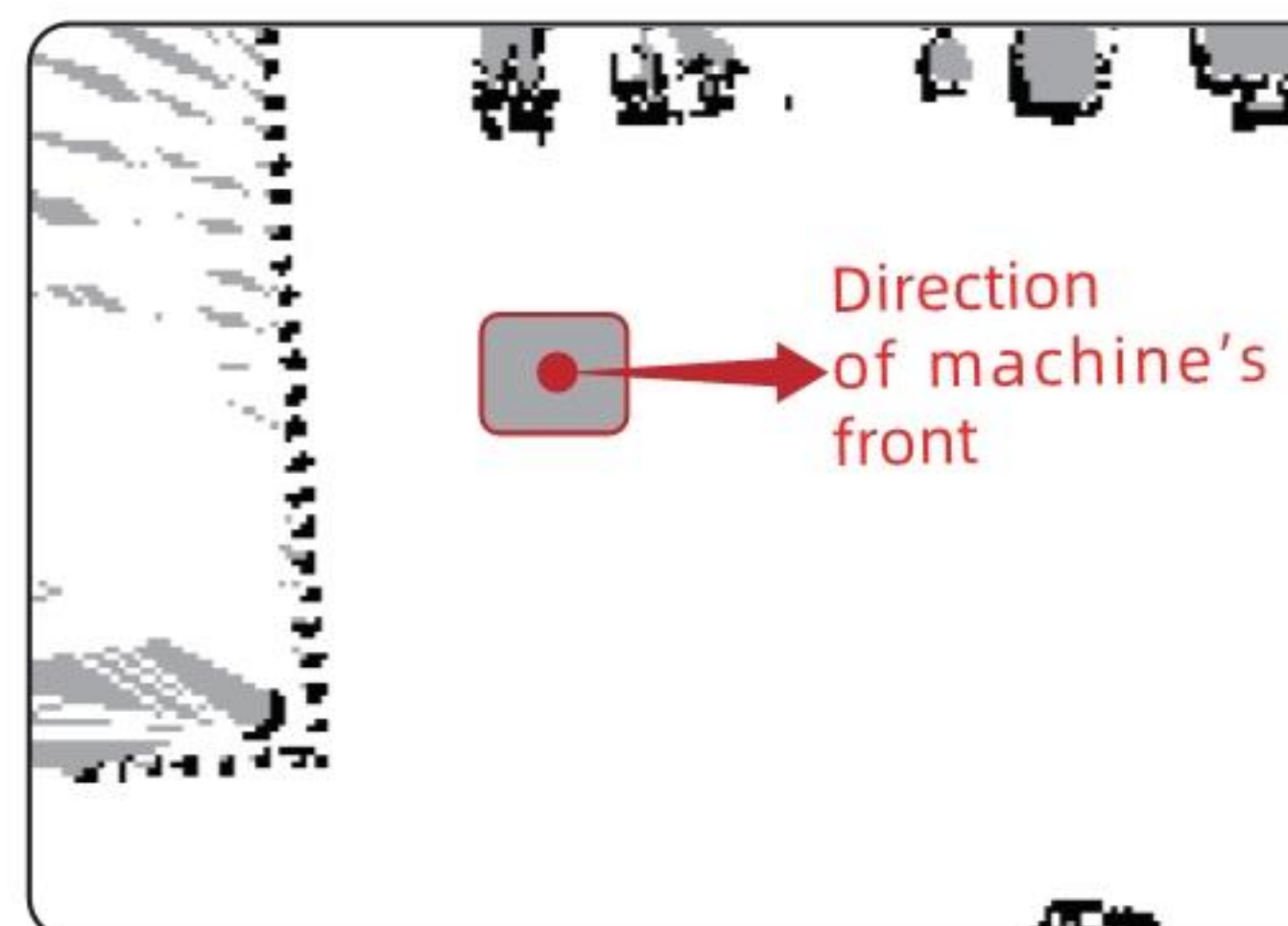
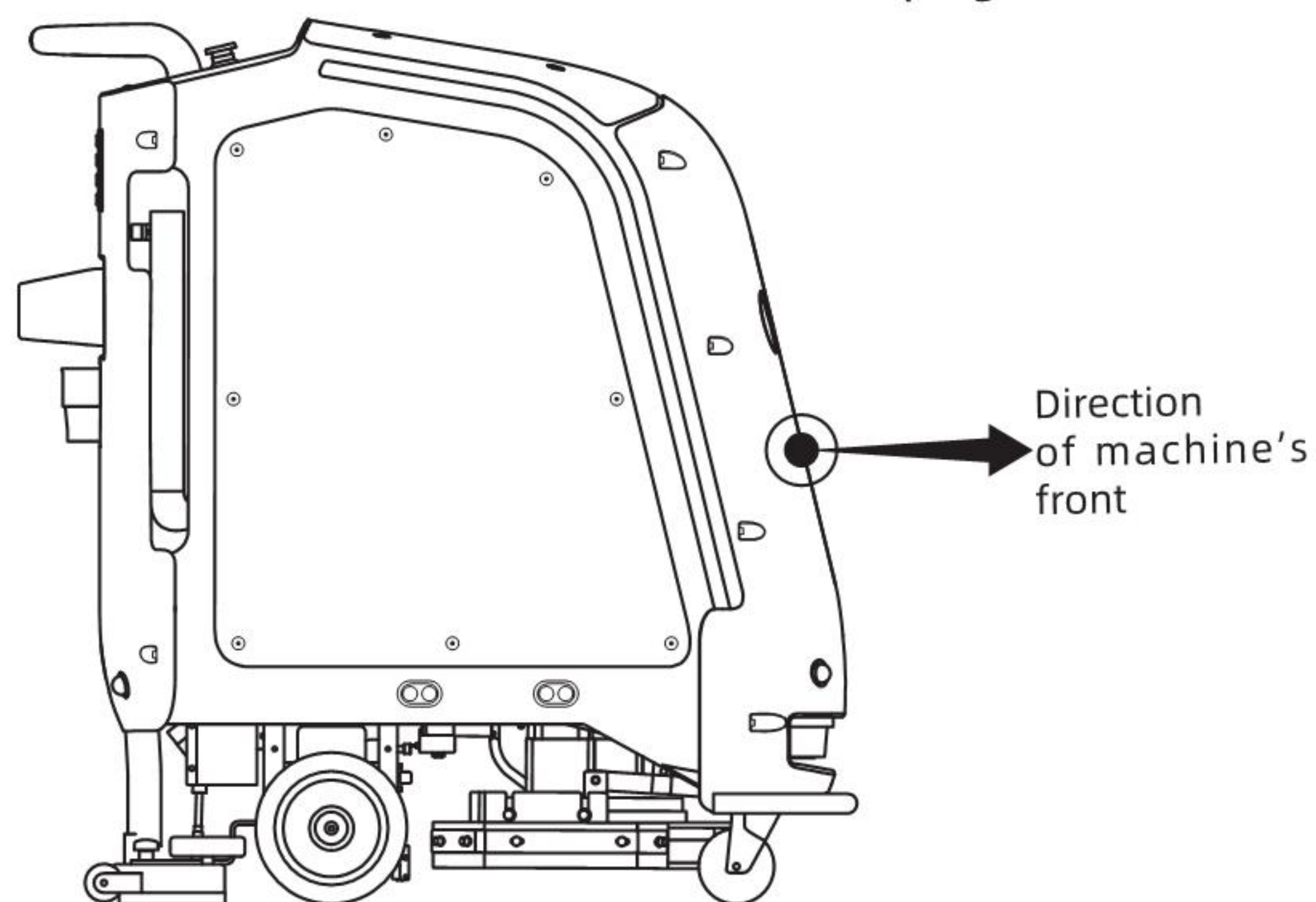
### What is automatic mode?

Machine can be operated independently according to the planned route in the automatic mode

### Usage method

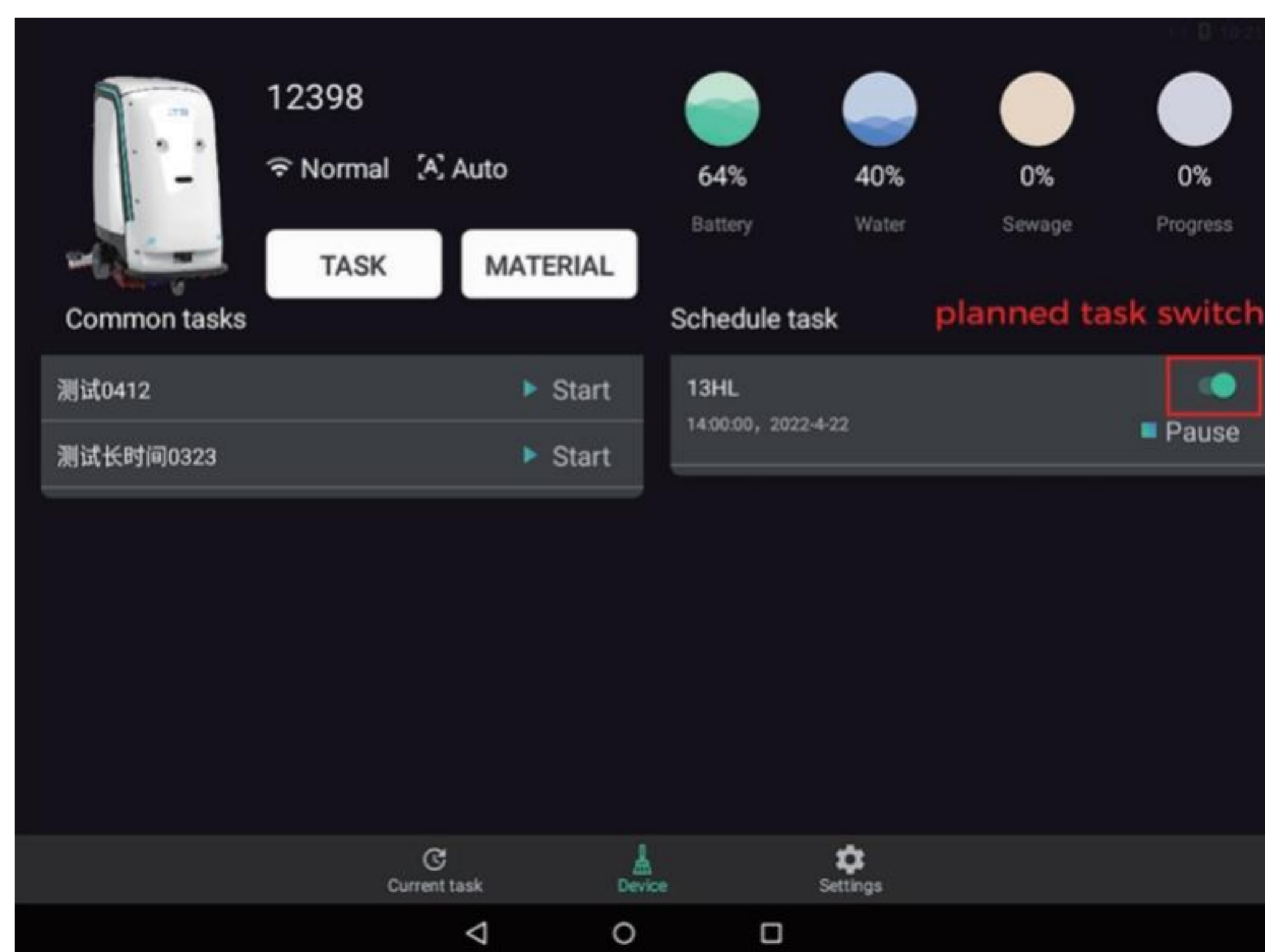
#### Common tasks

- 1 Move the machine to the startpoint of relevant common tasks, and adjust the direction of machine's front same with the startpoint of map route. (please refer to "Route Creation" on page 27 for relevant contents of route startpoint)

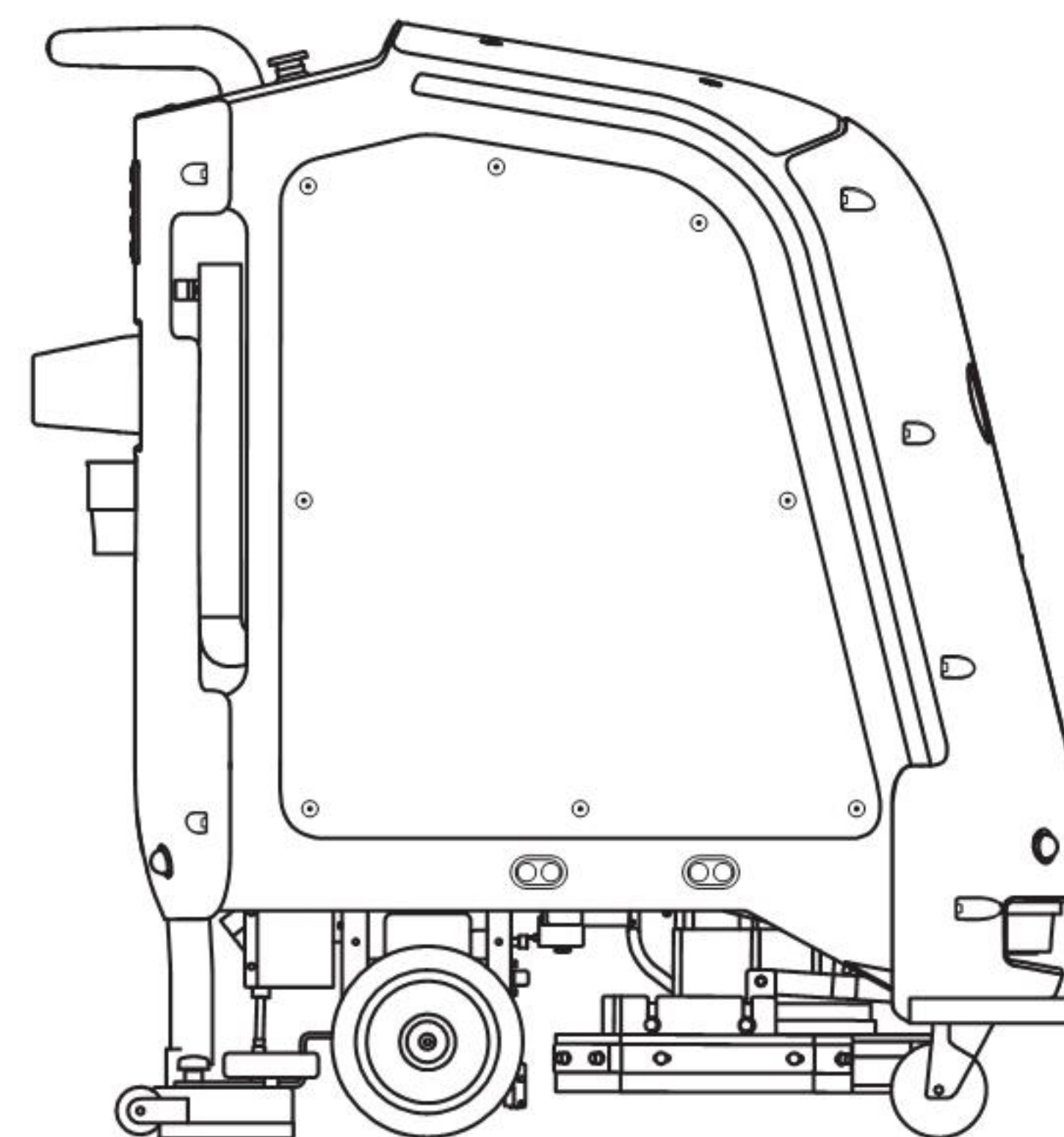




- 2 Select the right task on machine screen, and then click the button "Start" indicated by the arrow.



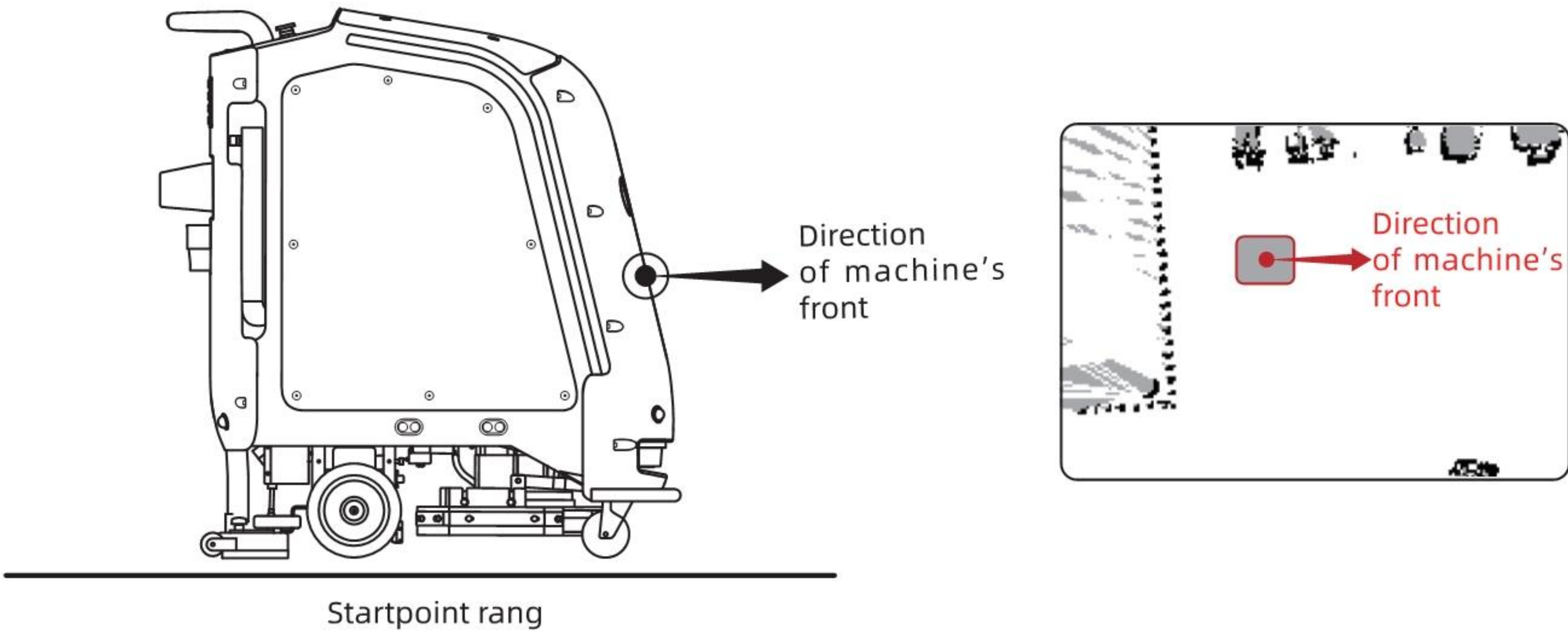
- 3 The machine starts the task automatically.



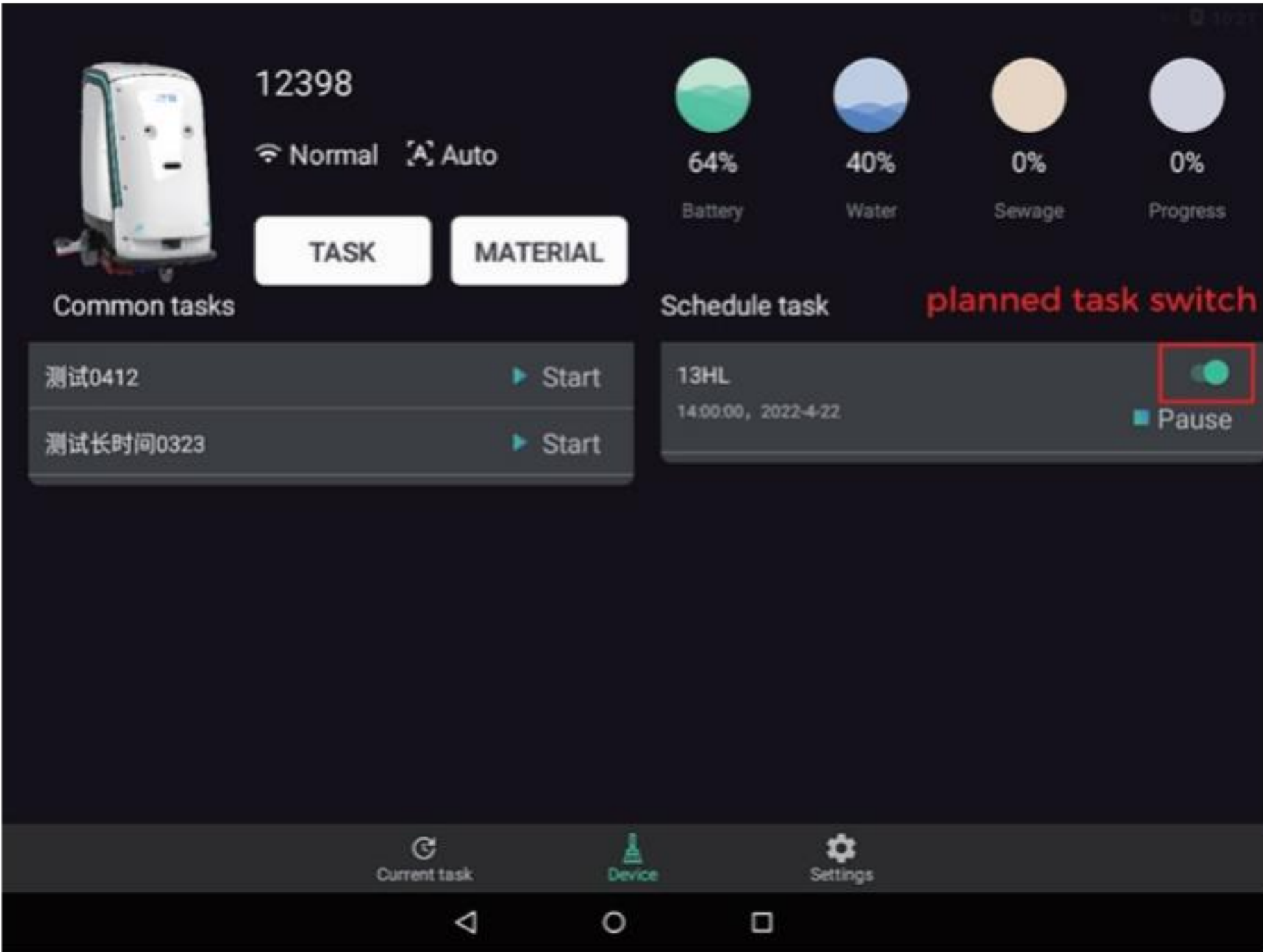


Schedule task

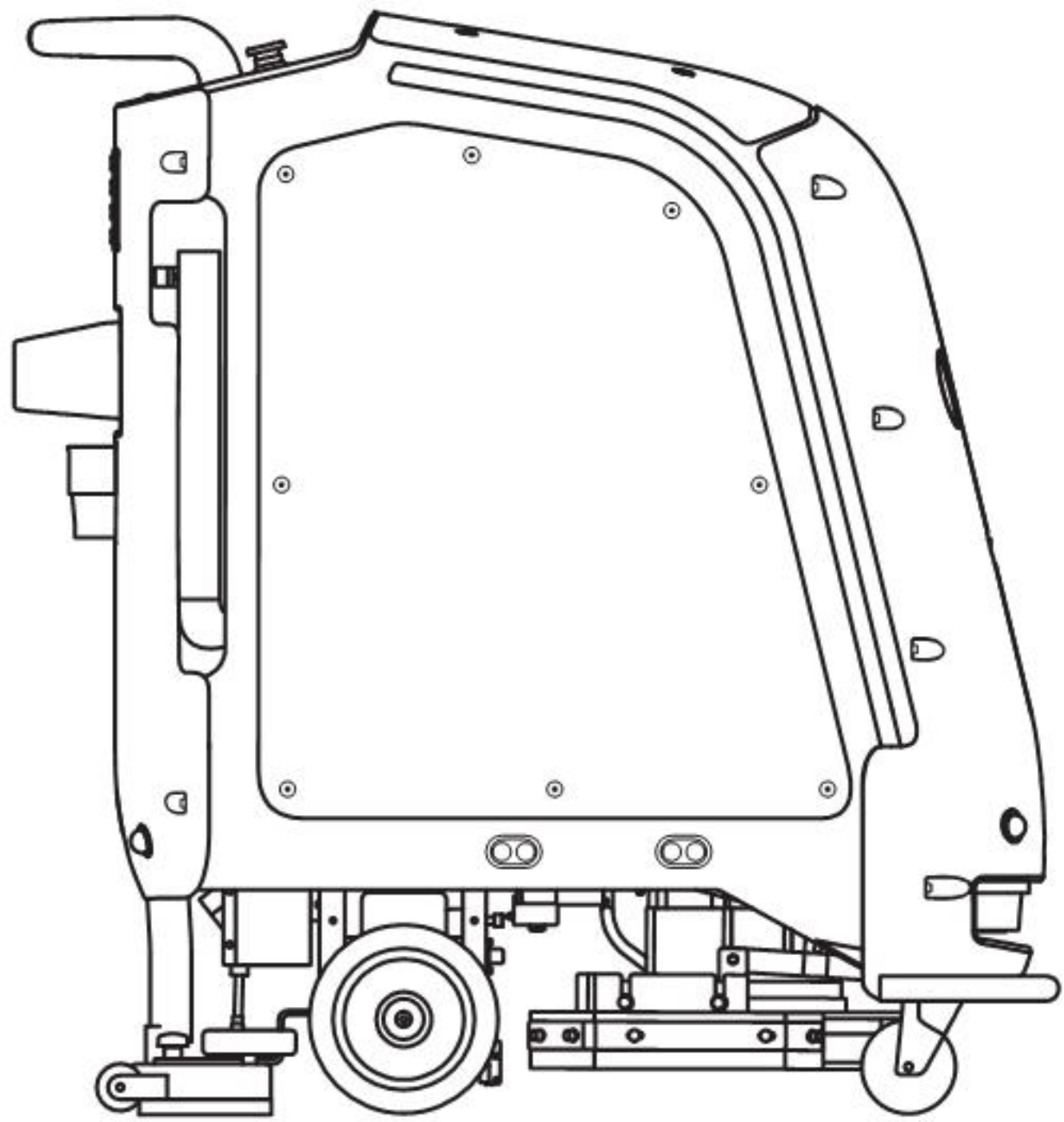
- 1 Move the machine to the startpoint of relevant schedule tasks, and adjust the direction of machine's front same with the startpoint of map route.。



- 2 Turn on the task switch of plan.  
Note: Please ensure that the schedule task switch is powered on when executing the schedule task.



- 3 The machine will automatically start the task at specified time.



Note: In case of creating a task, please contact iTR after-sales engineer.



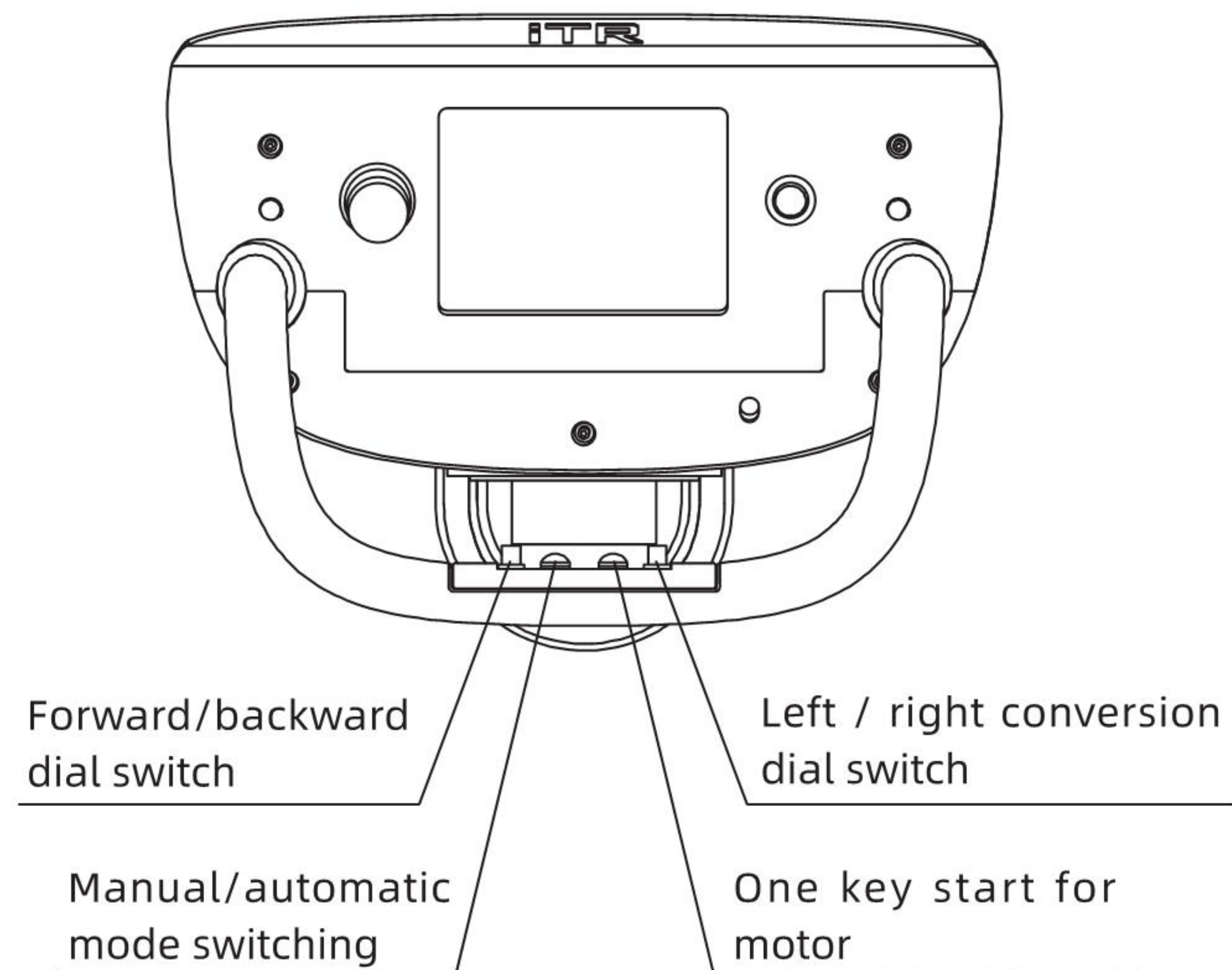
## Start manual cleaning

### What is manual mode?

User can use the keys on machine handle to control the machine to walk and clean operation in the manual mode.

### Usage method

#### One key start for motor



- 1 Manual mode switching  
The button on the left side of the handle is a manual / automatic switching button. After pressing the button, it will switch to manual mode. When the button is raised, the machine will switch to automatic mode.
- 2 One key start for motor  
The button on right side of handle is the cleaning start button. After pressing the button, all motors start with one button. When the button is raised, the motor will be changed to automatic mode.
- 3 Operation method of forward and backward dial switch  
Turn the machine to the forward: push down the forward and backward conversion dial switch.  
Turn the machine to the backward: push up the forward and backward conversion dial switch.
- 4 Operation method of left and right conversion dial switch  
Turn the machine to the left: push down the left and right conversion dial switch.  
Turn the machine to the right: push up the left and right conversion dial switch.



Note:

In case of creating a task, please contact ITR after-sales.

When the machine is in the rubber strip cleaning mode, it is close to the ground when the machine is turned on. If the machine retreats at this time, it will damage the suction wiper and adhesive strip.

## Travel states

The following travel states are included in machine running condition.

### Normal driving

Both manual and automatic driving modes are included. Under the normal driving state, the machine can start the cleaning brush discs and suction wiper. At this time, the machine runs at the speed of 0.3m/s-0.5m/s.

Tip: when the machine speed is below 0.41m/s, the obstacle avoidance response distance is 0.25m. When the machine speed is higher than 0.41m/s, the obstacle avoidance response distance is 1m.

### Comity mode

Comity mode will appear in automatic mode. When people or other obstacles suddenly appear in front of the machine while driving, the machine will stop moving, trigger the comity mode, and the cleaning brush disc will stop running. When people or obstacles leave, the machine continues to move forward.

### Active obstacle avoidance

Active obstacle avoidance mode will appear in automatic mode. When the machine is moving, people or other obstacles suddenly appear in front. At this time, the machine will stop moving forward and trigger the comity mode to stop the operation of the cleaning brush disc. If the obstacle always exists, the machine starts to bypass the obstacle actively. When the machine bypasses the obstacle, the cleaning brush discs still does not operate until the machine stops for two times, it indicates that the machine has completed the obstacle winding and the cleaning brush discs operates normally.

### Loss of positioning

When the mode of bypassing obstacles is triggered, the machine may lose its positioning. Specifically, it does not follow a scheduled route, and starts to spin in place or run erratically.



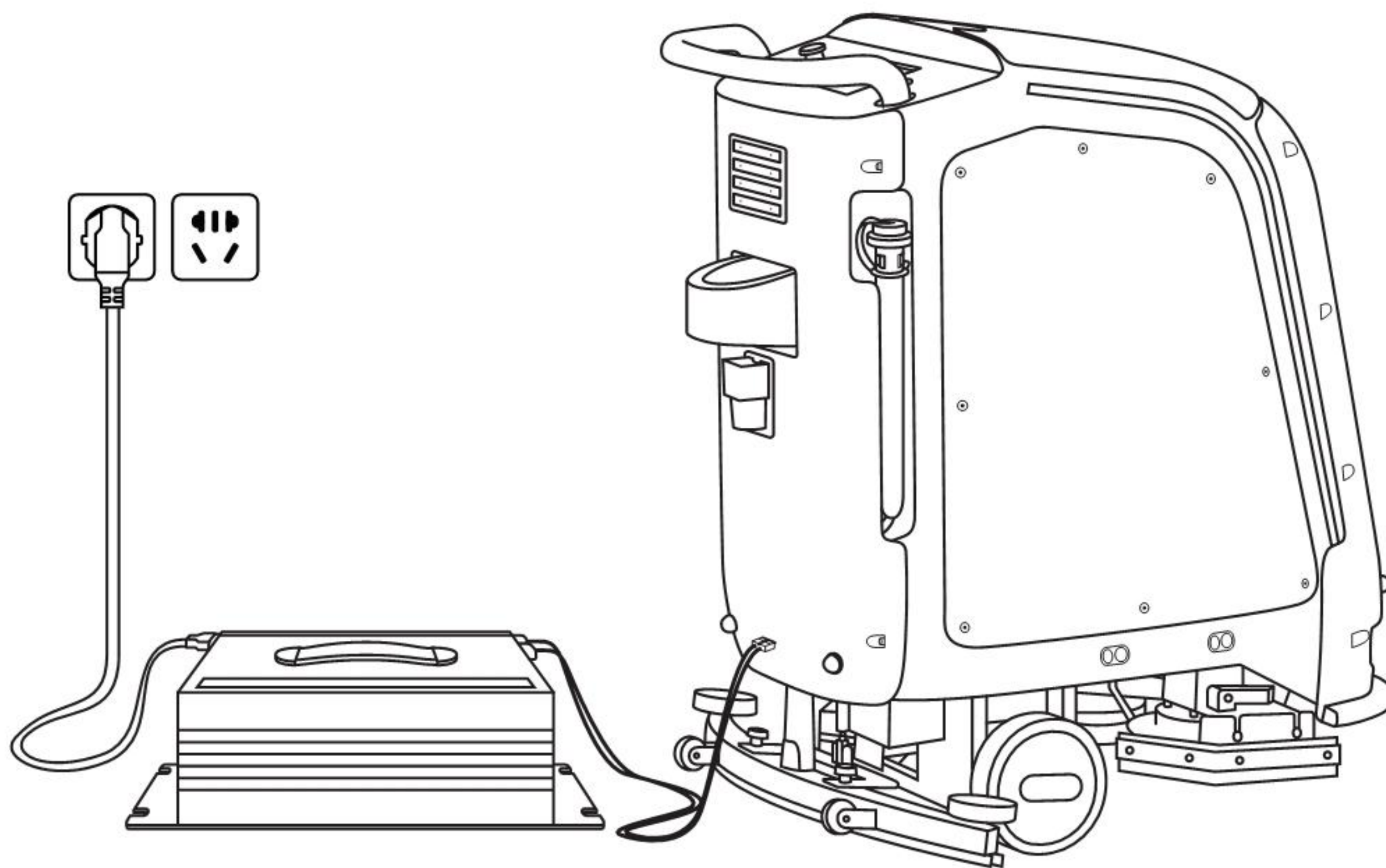
## Emergency stop mode

The emergency stop mode needs to be triggered actively by the user. When the machine is performing tasks, press the emergency stop button and the machine will stop walking.

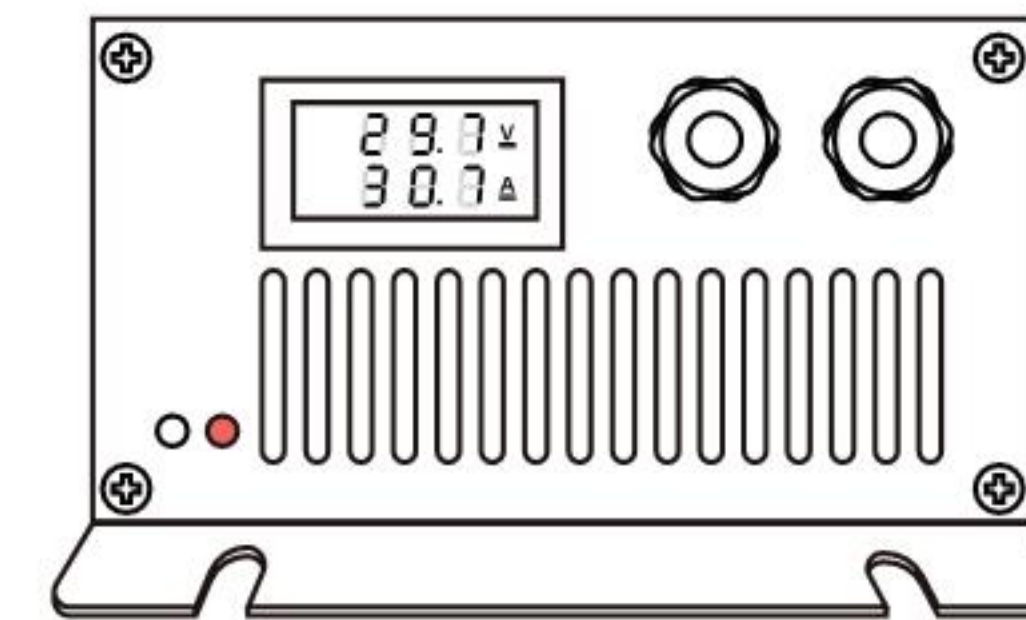
The cleaning brush discs under the machine will also stop running and lift up, the suction scraper will lift up, the suction motor will be turned off, and the light bar will change from constant light to continuous flashing.

## Manual charging

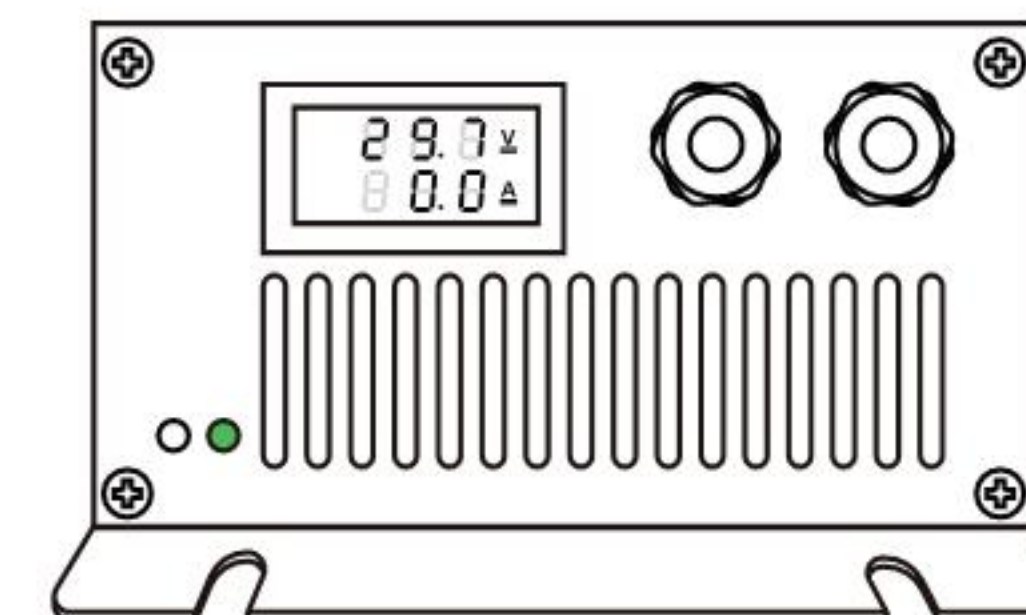
- 1 Please move the machine near the socket.
- 2 Please insert one end of the charger connected to the machine into the charging port behind the machine. If you hear the sound of "Click", it indicates that the charger has been inserted correctly;



- 3 Please connect the charger plug to the power socket. At this time, the indication on the charger changes from green to red, which means that the machine is charging;



- 4 When the machine is fully charged, the charger will show green. At this time, please unplug the charger in time to avoid potential safety hazards caused by long-time power on of charger.



Note: There are two lines of numbers that will be displayed on charger. The first line is the voltage when charging. The second line is the current when charging.



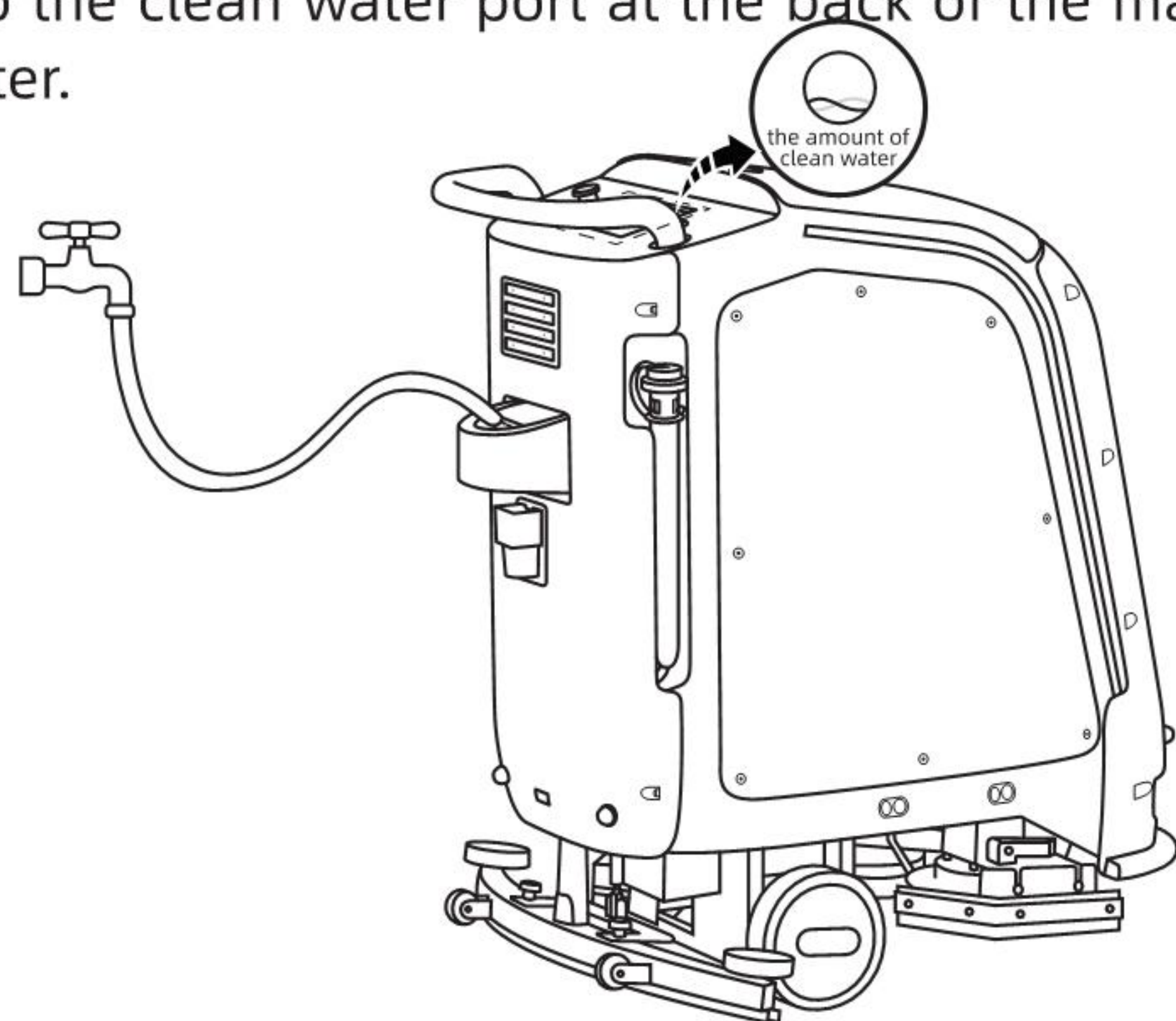
## Automatic charging (optional)

The machine can be equipped with Water supply and drainage station. After the deployer successfully deploys the station, if the power of the machine is less than 10%, the machine will automatically return to the station for automatic charging.

## Add clean water

### Manually add clean water

When the machine is powered on, please insert the water pipe into the clean water port at the back of the machine to add clean water.

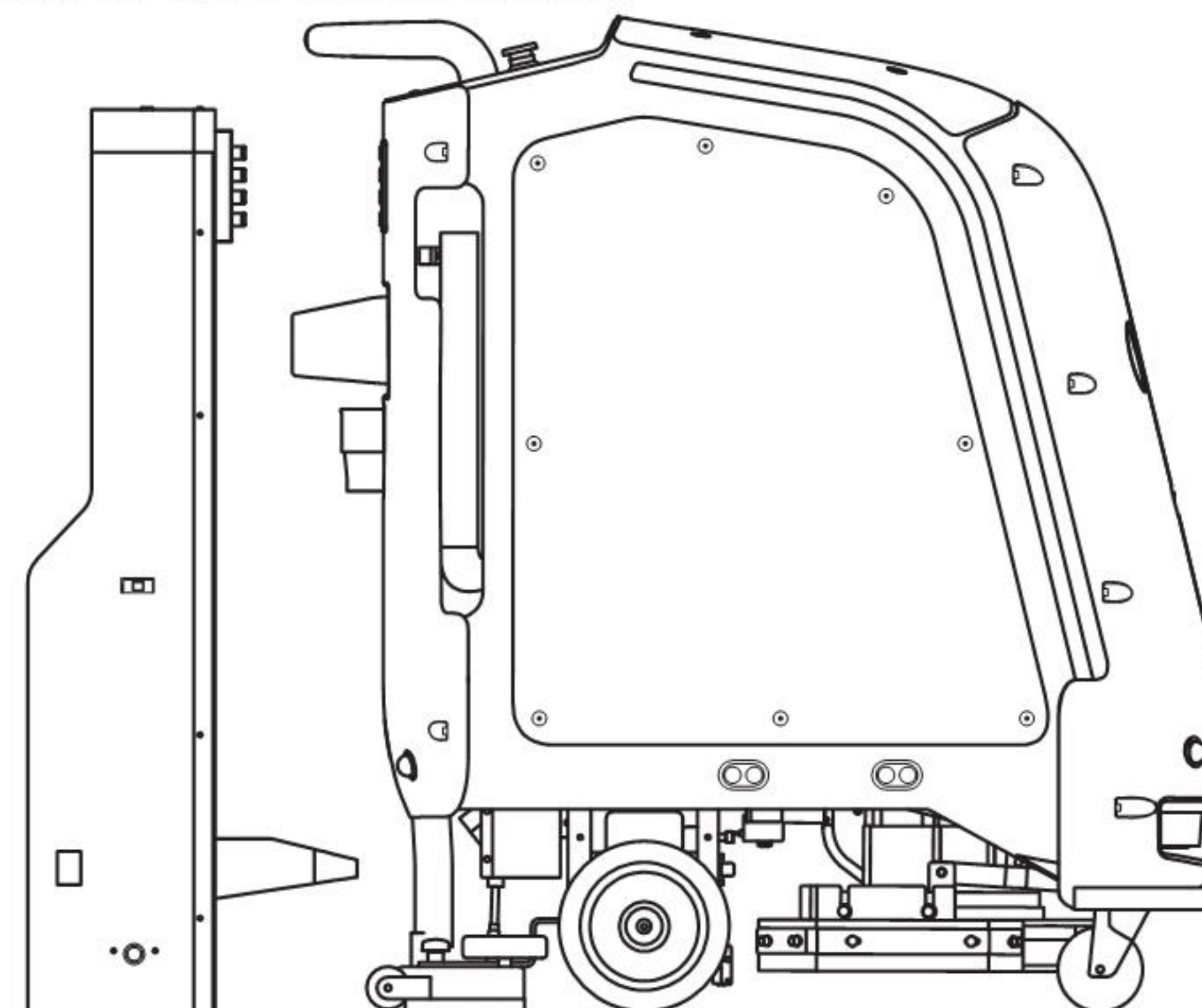


Note:

Please carefully observe the change of the amount of clean water on the machine screen when adding water. When the amount of clean water reaches 100%, please stop adding immediately.

### Automatic add clean water (optional)

When there is no clean water, the machine can return to the station to add clean water.

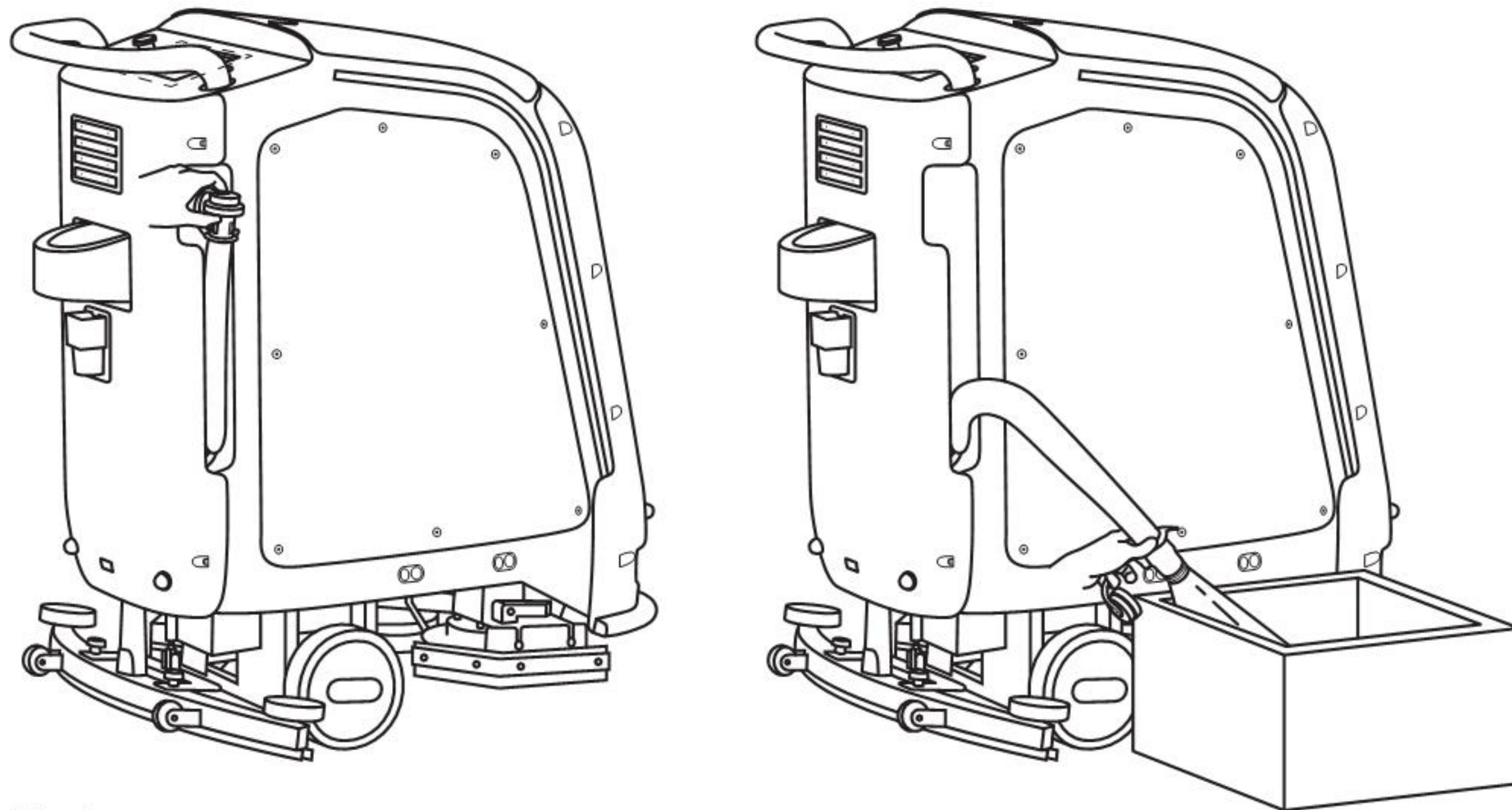




## Discharge sewage

### Manually discharge of sewage

- 1 Please remove the manual drain pipe at the back of the machine.
- 2 Please unscrew the cover and put down the sewage pipe, and the sewage will be discharged.
- 3 After the sewage is discharged, screw the cover and put it back to the original position of the machine.

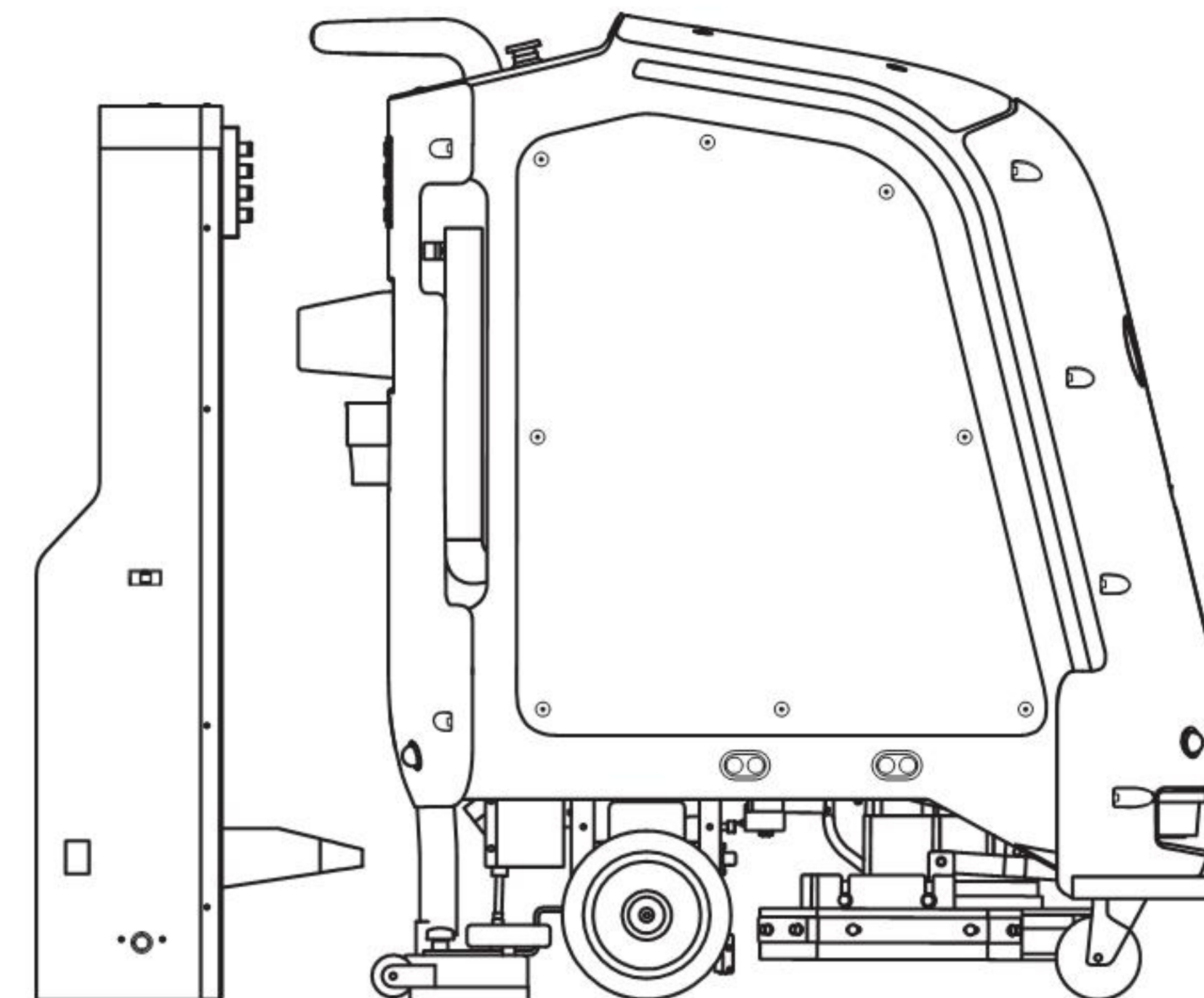


Note:

Please carefully observe the change of the amount of clean water on the machine screen when adding water. When the amount of clean water reaches 100%, please stop adding immediately.

### Automatically discharge sewage (optional)

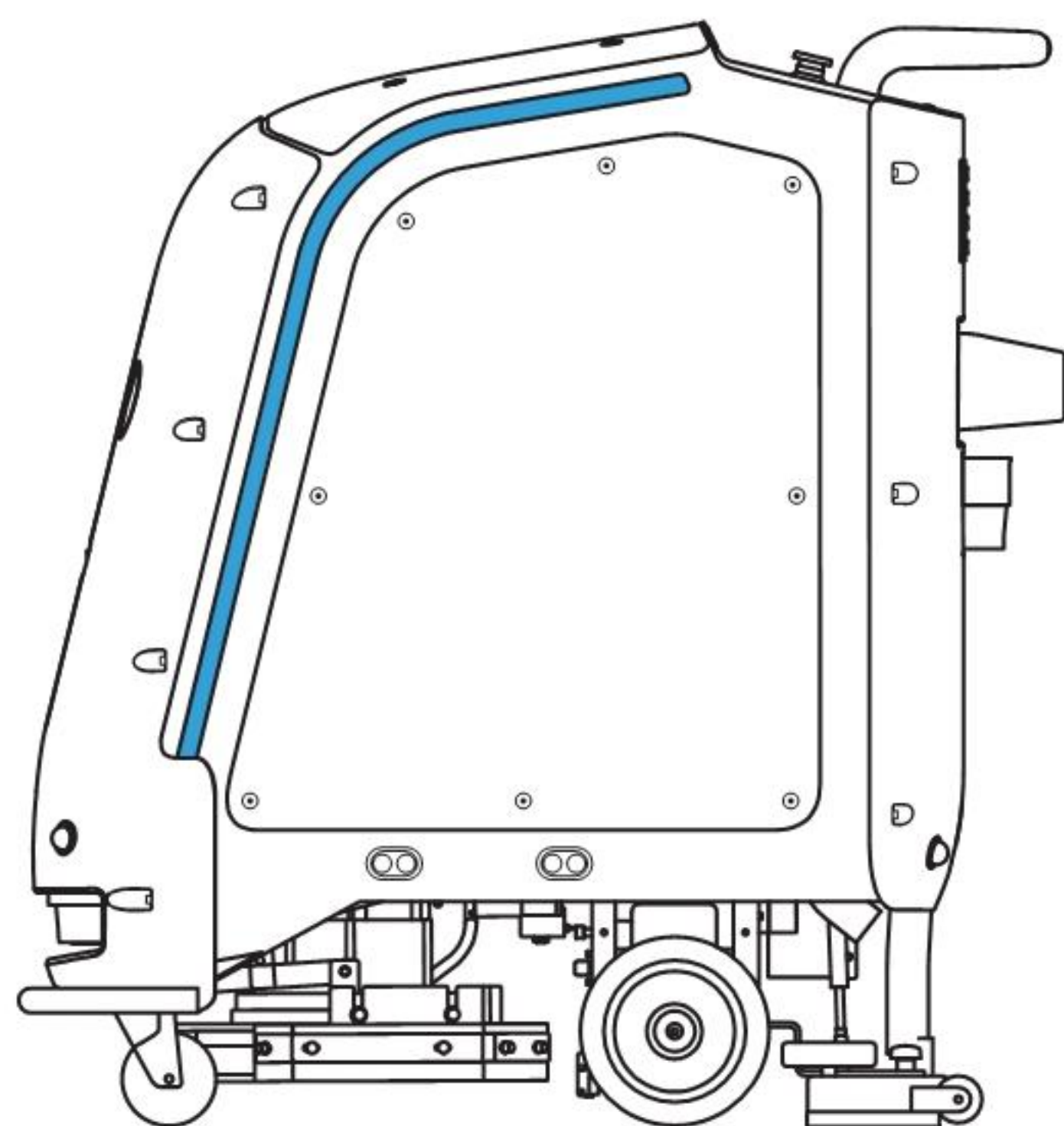
When the sewage tank is full, the machine will automatically return to the station to discharge sewage.





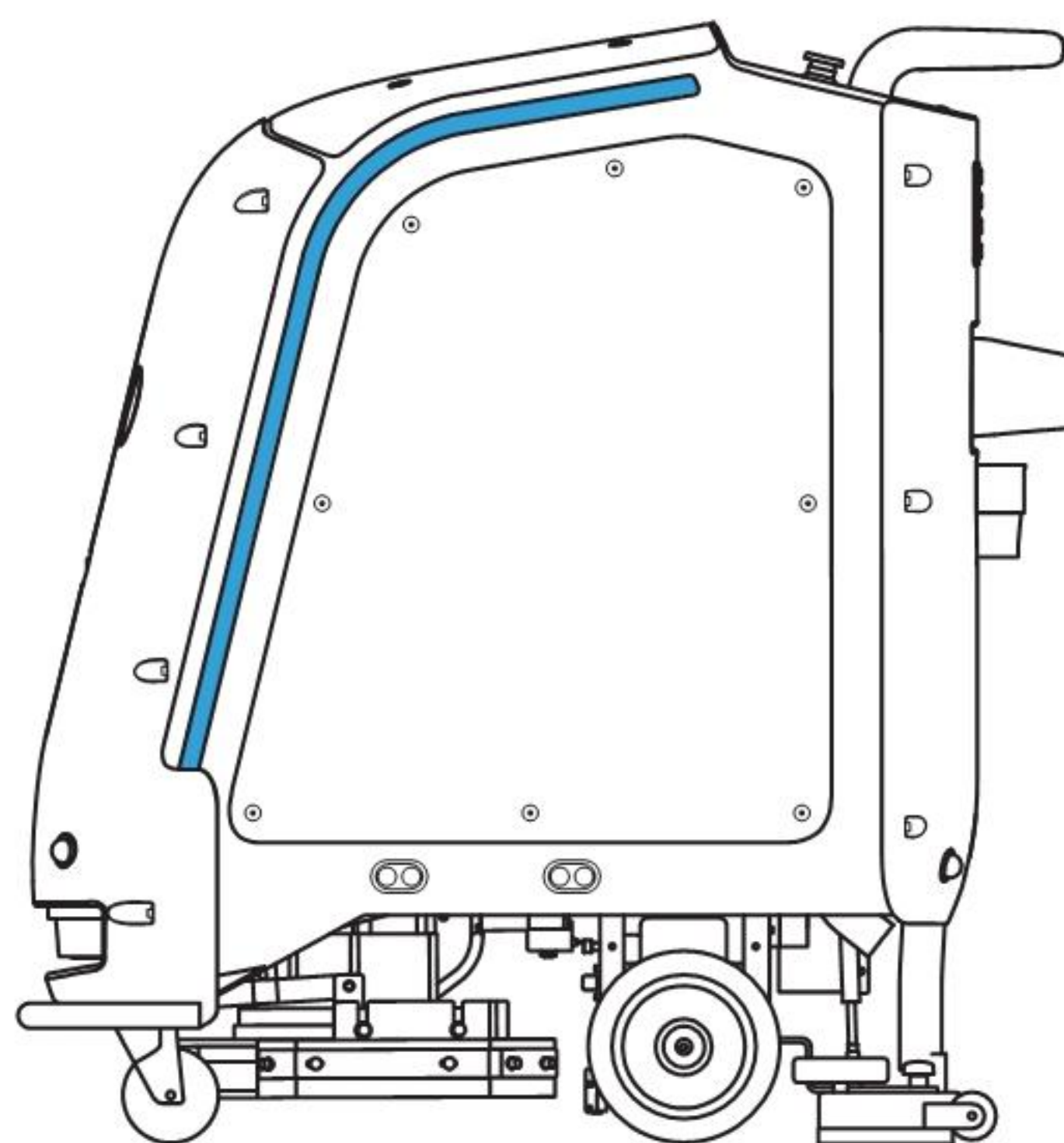
## Light bar statess

The light bar of M2 Pro is located on the left and right sides of machine. Light bar will be blue when powered on.



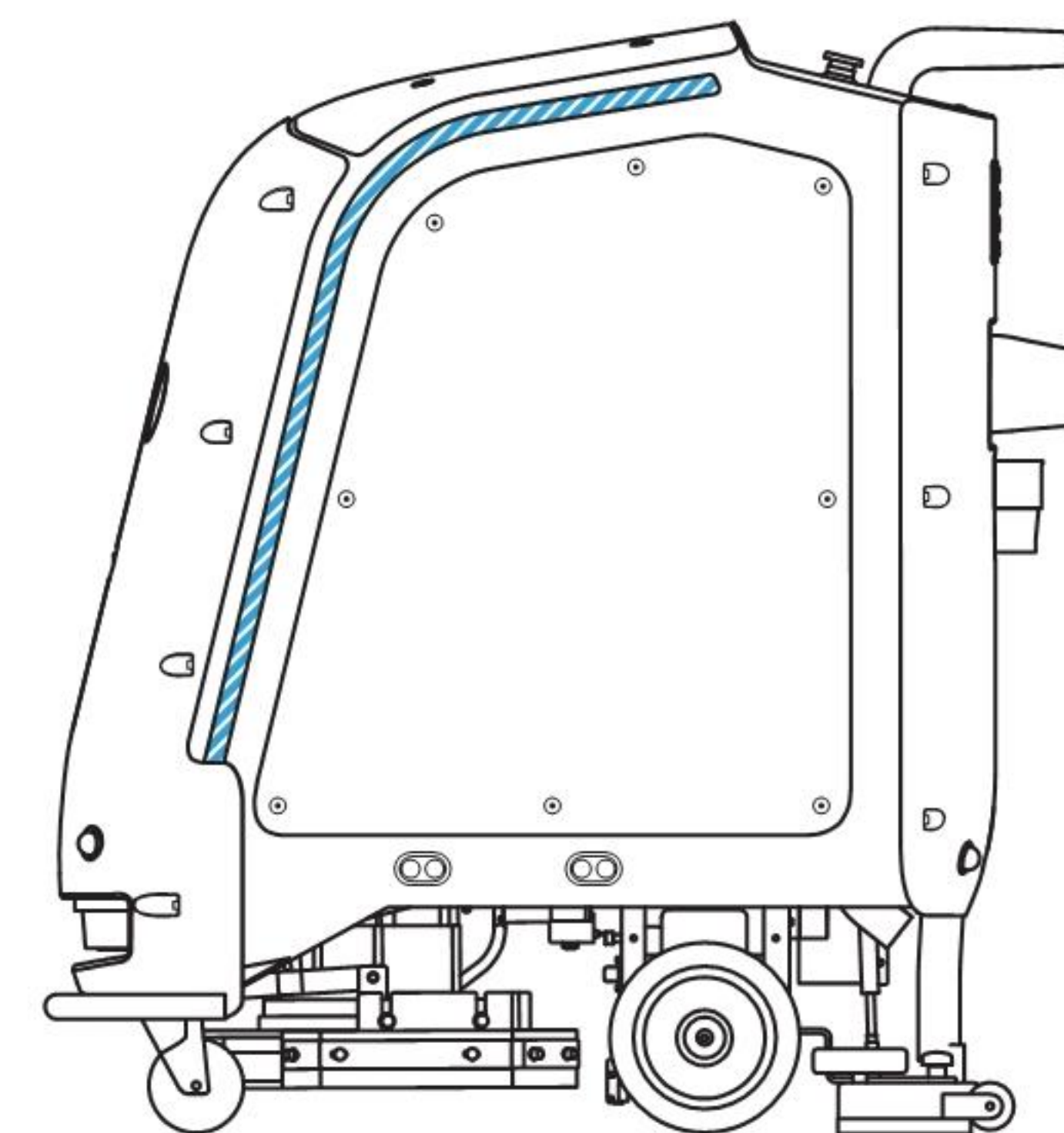
### Shining

The situation indicates that the emergency stop button of the machine has been pulled out. The machine can start the cleaning task normally, but the user cannot push the machine to move.



### Flashing

The situation indicates that the machine is in an emergency stop state, and the machine cannot perform the cleaning task, but the machine can be pushed manually.





## Troubleshooting

### Power on

Troubles content	Possible causes	Solutions
Unable to power on.	Insufficient power.	Move the machine close the charging port and charge.

### Map creation

Troubles content	Possible causes	Solutions
The drive wheel cannot be locked.	Pressed emergency stop button.	Pull up the emergency stop button.
	Pressed the manual automatic switch button, and the machine was in manually control mode.	Press the manually automatic switch button again to switch the machine to automatic mode.
When creating map for machine through the mobile APP, the travel of machine was failed to be controlled.	The mobile APP failed to connect with machine's WiFi.	Connect the phone with machine's WiFi.
When creating map for machine through the mobile APP, the machine will stop.	Poor signal in the area.	Wait for machine's signal turn to good, and then let machine travel.



Troubles content	Possible causes	Solutions
After creating the map, there is only [.2D] file in map file of machine.	The new map has not been created yet.	Wait for 5 to 10 minutes, after creating the map of machine, and then enter the engineering software for next operation.
	Program error.	Waiting 5 to 10 minutes, powered off and repower on.

## Route planning

Troubles content	Possible causes	Solutions
After planning the route, the map uploading was failed.	The engineering software is placed in the Chinese directory.	Move the engineering software to the English directory.
	The computer failed the proper connection to the wireless network of machine.	Connect the computer to the wireless network of machine.
	Packet loss occurs during map uploading.	Upload the map again.
Click "Save" after modifying the route, and the modified content failed been saved.	The route name to be modified failed to be selected.	Select the route name to be modified, then re-modify it and save it.



## Automatically start cleaning task

Troubles content	Possible causes	Solutions
The machine cannot be powered on normally when starting the task.	Emergency stop button was pressed.	Pull up the emergency stop button.
	Failed map uploading.	Re-upload map.
	The machine is not within the range of the startpoint.	Move the machine to the starting point of the route (effective range is within 1m).
The machine automatically stops and ends the task when executing a task.	The clean water volume of machine is less than 10%.	Add clean water to machine's clean water tank.
	The power of machine is less than 10%.	Power off and charge.
	The sewage volume of machine reaches 100%.	Drain the sewage from the sewage tank of the machine.
The machine's action track is abnormal or turns when executing a task.	There is dust or sewage on the laser lidar surface.	Wipe the laser lidar with a cleaning cloth to keep the surface free from foreign objects.
	Failed positioning.	End the task and repower on the machine.
	Great changes to scene.	Redeploy machine maps,routes, tasks.
	Error task selection.	Reselect the task in the current area for cleaning.



Troubles content	Possible causes	Solutions
Unable to avoid obstacles.	The ultrasonic function is not powered on.	Contact the after-sales personnel and power on remotely.
Poor effect on water absorption.	There is residue at the bottom of the suction wiper.	Cleaning suction wiper.
	The use time of the suction wiper is too long, and the rubber strip of the suction wiper is seriously worn.	Replace suction wiper.
	The water output of the machine is adjusted too much.	Adjust water output of machine.
	There is sand on the ground, which is partially left at the suction strip during machine cleaning.	The water output can be increased. After cleaning for many times, the sand on the ground will gradually decrease, and then it can be cleaned normally.
When turning back or turning around, the front of machine triggers obstacle avoidance.	When planning the route, it is too close to obstacle ( $\leq 65\text{cm}$ ) from the front of machine.	Modify machine route.
The cleaning distance of side edge of machine is not enough.	When planning the route, the side of the machine is too far from the wall ( $\geq 10\text{cm}$ ).	Modify machine route.



## Manually starty cleaning task

Troubles content	Possible causes	Solutions
The machine cannot travel.	Pressed emergency stop button.	Pull up the emergency stop button.
	The manual automatic switching button is not pressed.	Press the automatic switch button.
	Triggered the collision-proof tentacle.	After pressing the emergency stop button, pull up the emergency stop button and wait for several seconds.

## Input fingerprint (optional)

M2 Pro can configure three different power on buttons for customers, including fingerprint power on button. When user enters a fingerprint, there will happened with fingerprint entry failure. Here are some solutions to the failure of fingerprint entry.

Troubles content	Possible causes	Incorrect fingerprint acquisition method
Failed to enter fingerprint.	Insufficient fingerprint acquisition time.	Press your finger on it for a little longer, and then release your finger when you hear the music.
	Incorrect fingerprint acquisition method.	Please follow the steps of "Fingerprint Entry" in "Machine Operation" for correct operations.



## Sewage discharging

Troubles content	Possible causes	Solutions
Sewage cannot flow out of the manual Sewage discharging pipe.	The outlet of the sewage tank is blocked.	Dredge the water outlet and clean the sewage tank.
	Sewage tank filter was blocked.	Clean the filter.

## Charging

Troubles content	Possible causes	Solutions
The indicator light is not on when the charger is plugged into the power supply.	The charger is not plugged in tightly.	Ensure that the connection between the charger and the machine and the power supply is in a tight state.
	The switch on the charger is not turned on.	Turn on the switch.



## Daily maintenance

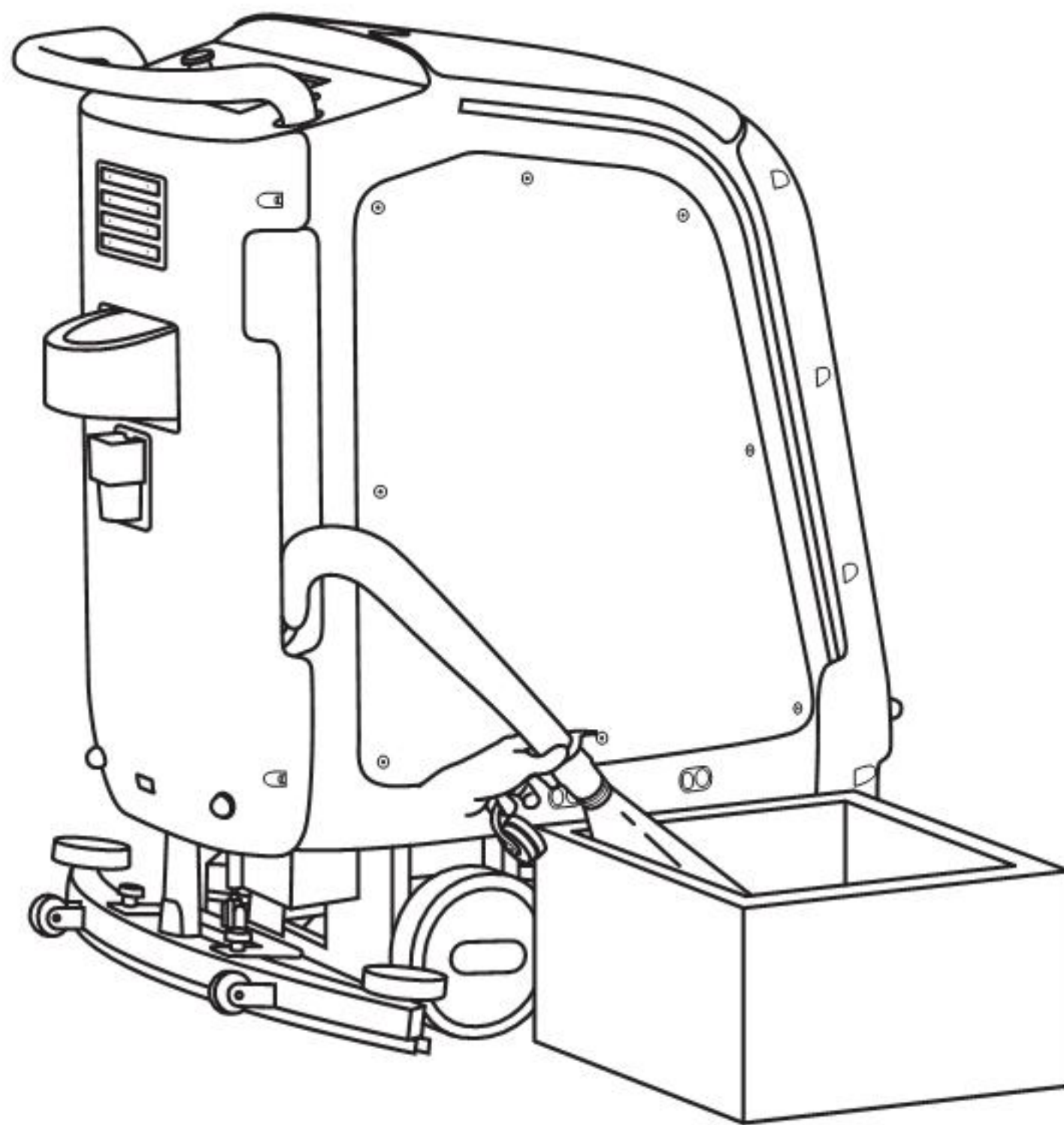
### ⚠ Cautions!

**Before maintaining the product, please observe the following:**

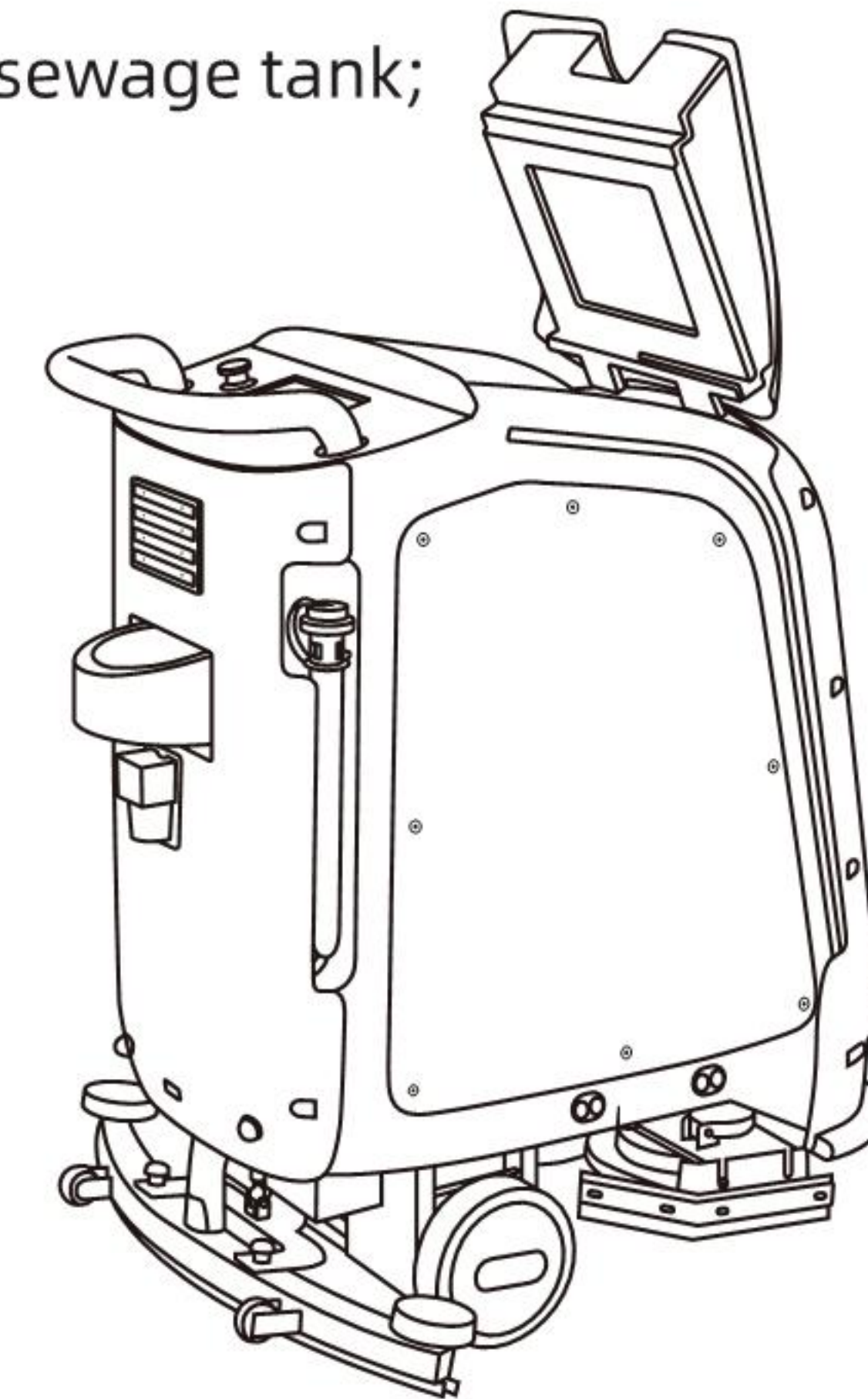
1. Please turn off machine's power button before maintaining.
2. Please do not modify the machine or change its original design or configuration without authorization. For maintenance, please contact the professional maintenance personnel designated by the manufacturer.
3. You are recommended to use accessories sold or recommended by iTR only.
4. If the machine is not used for a long time, please drain the sewage and clean the sewage tank, cut off the power of the machine, and ensure that the machine is charged once a quarter to prevent over discharge of internal batteries and reduce battery life.

### Clean the sewage tank

- 1 Please put down the manual sewage pipe and drain the sewage from machine;

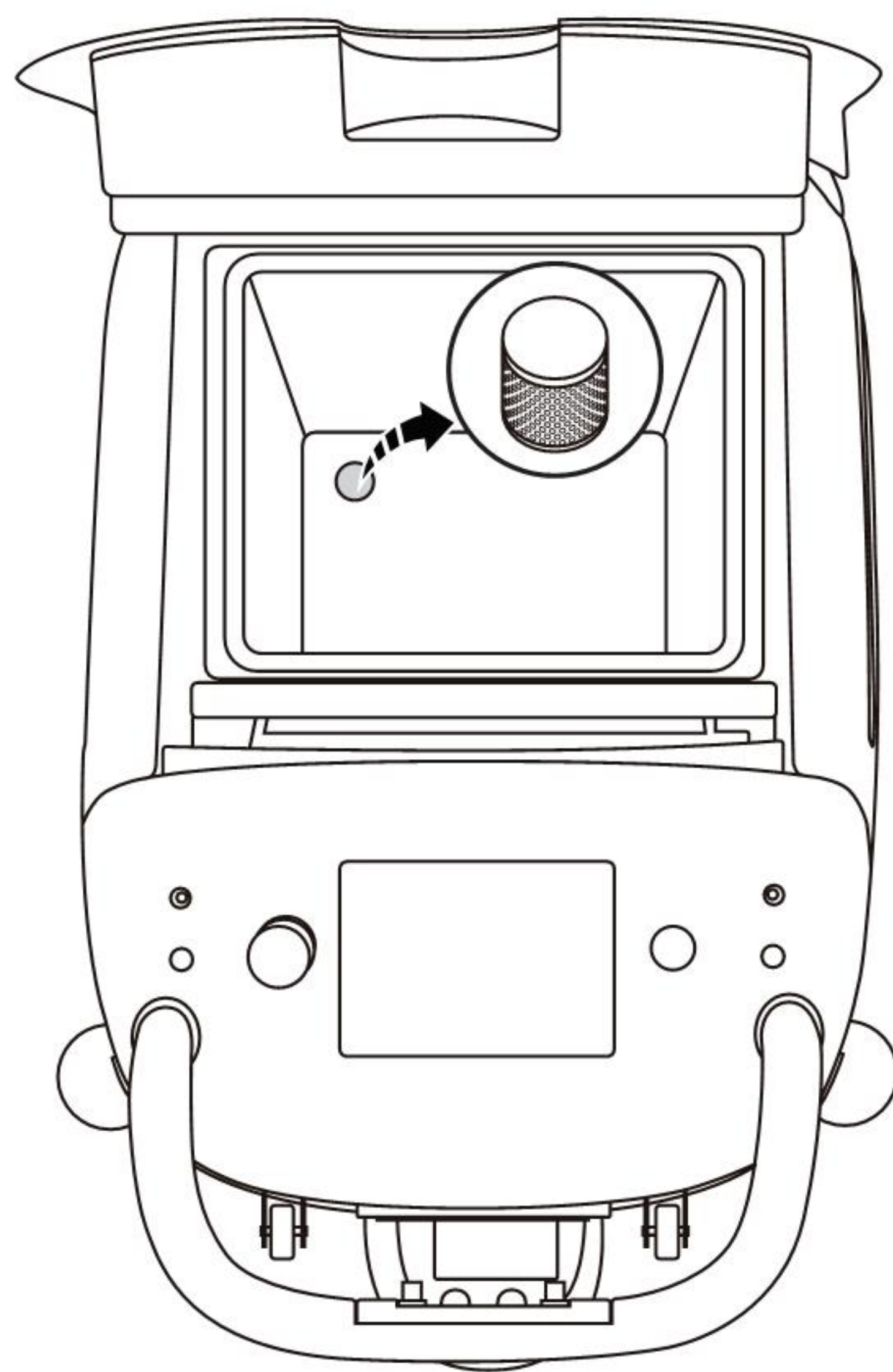


- 2 Open the cover of sewage tank;

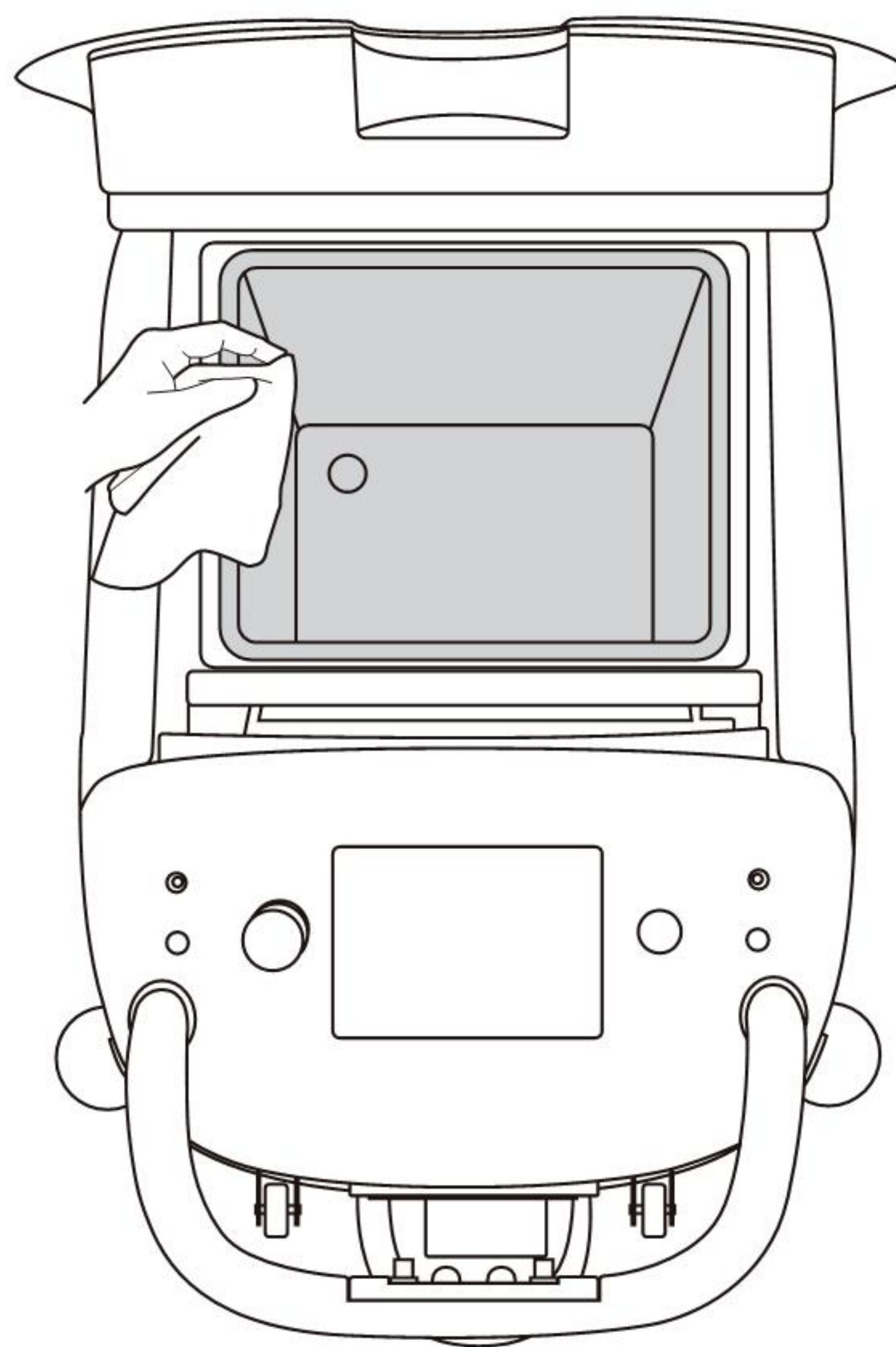




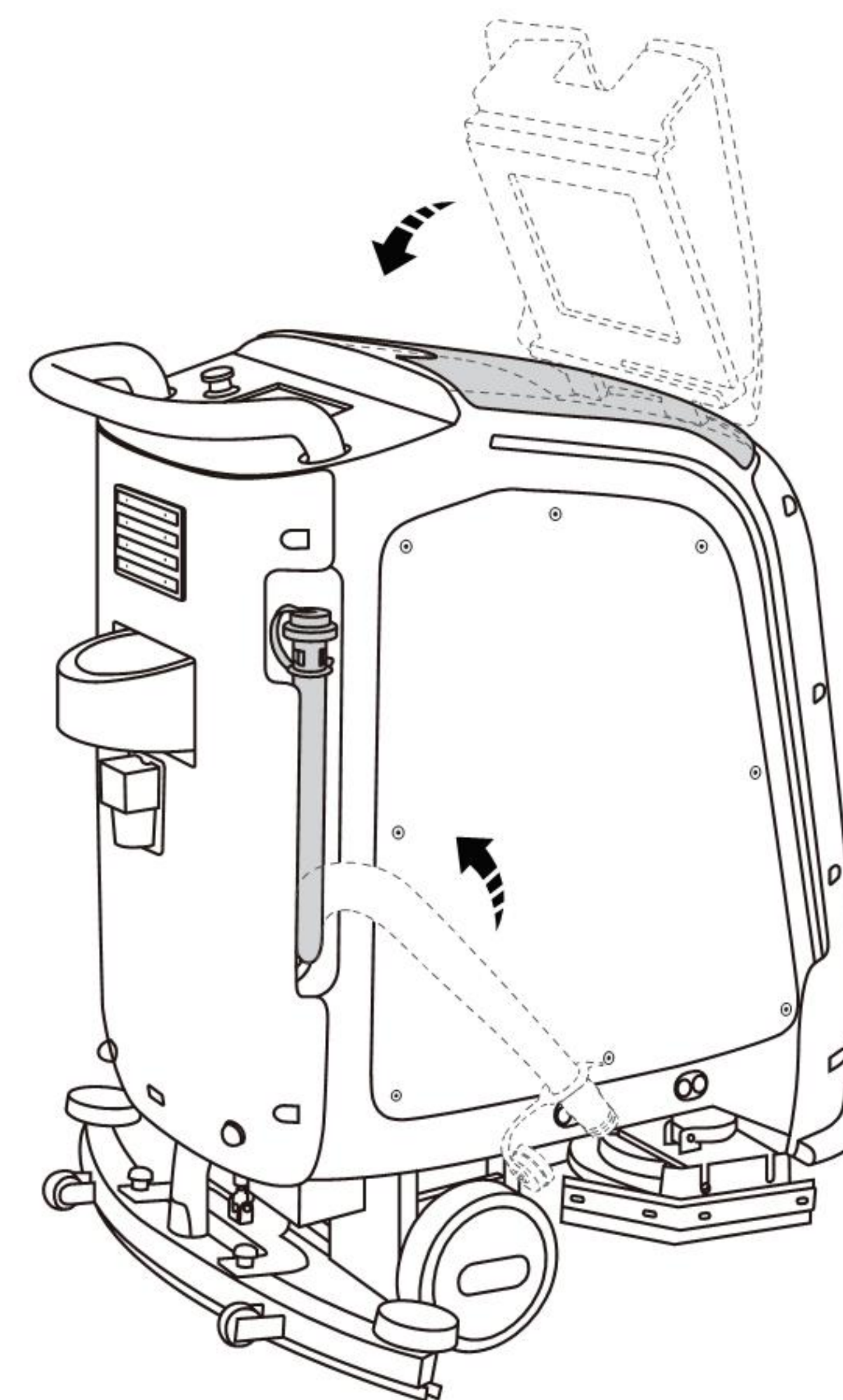
- 3 After unscrewing the filter at the water outlet of sewage tank, please wash the sewage tank carefully.



- 4 Please wipe around the water tank with a wet rag until it's clean.



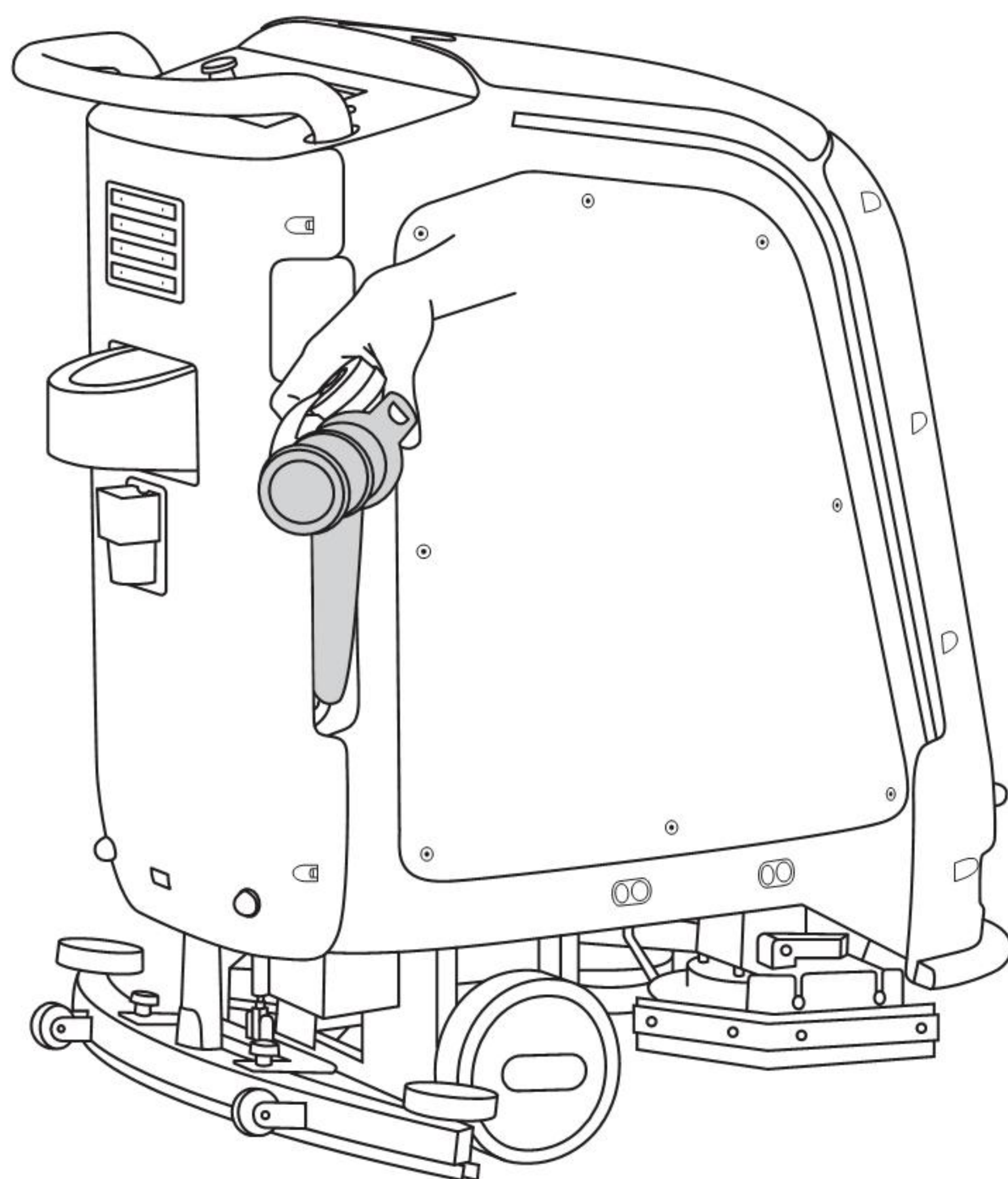
- 5 After the sewage tank is completely cleaned, put the filter back into the water tank, cover the sewage tank cover, and return the sewage pipe.





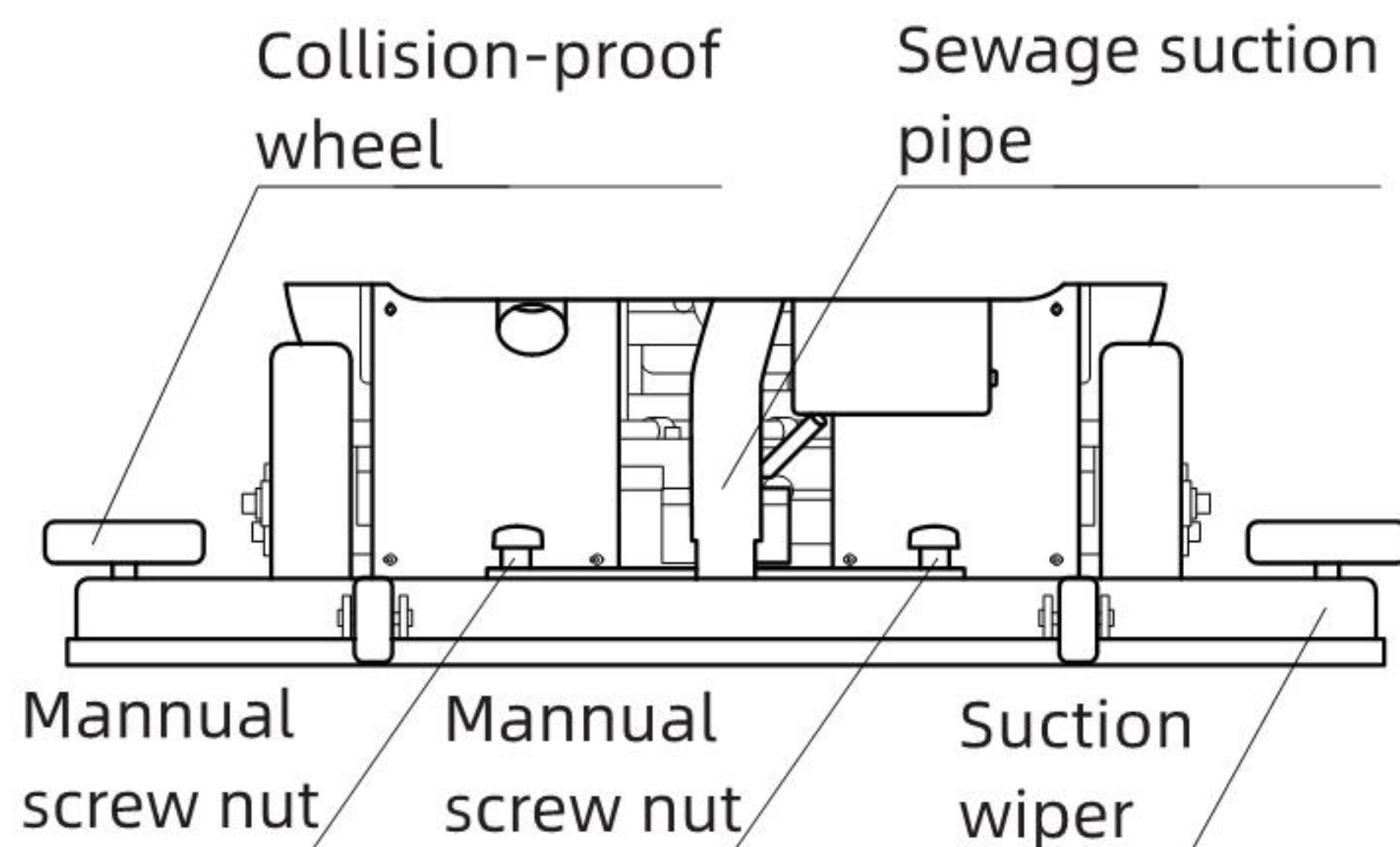
## Clean the sewage pipe

Remove the cover of sewage pipe and wash it with clean water until it's clean.



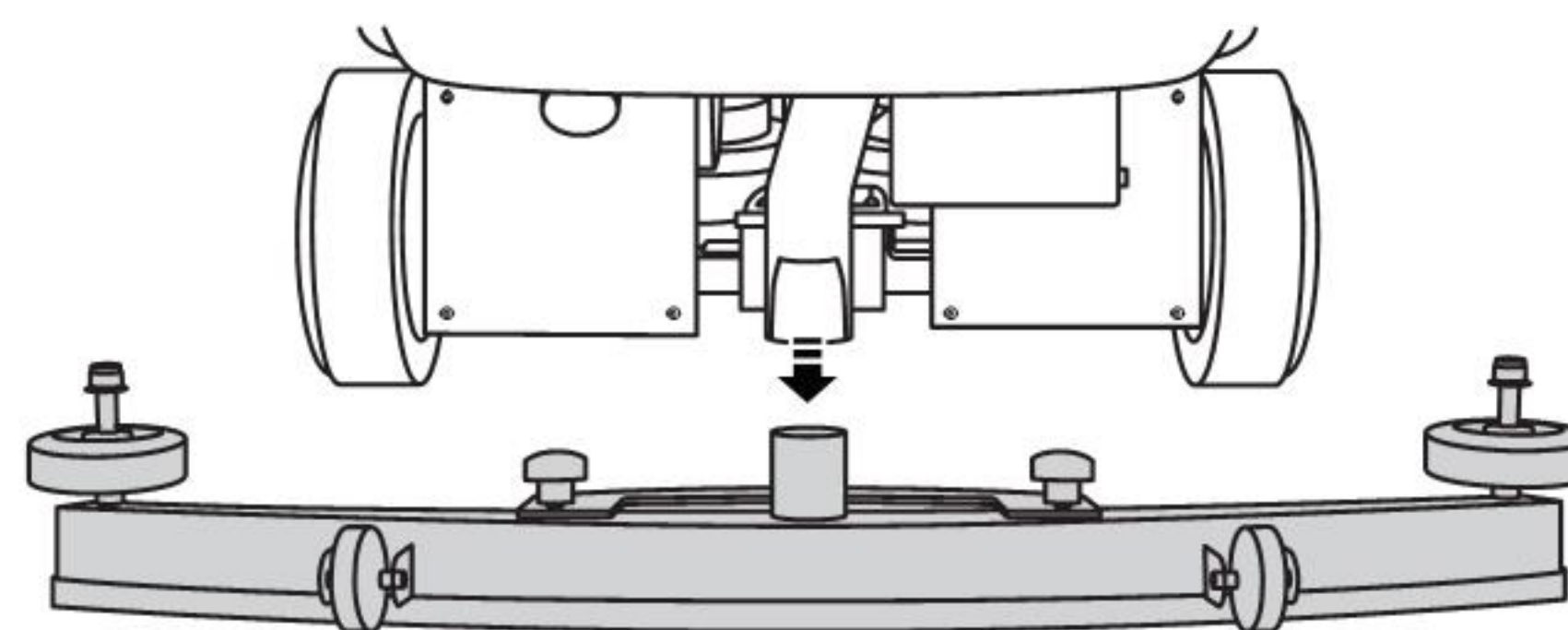


## Replace the suction wiper and rubber strip

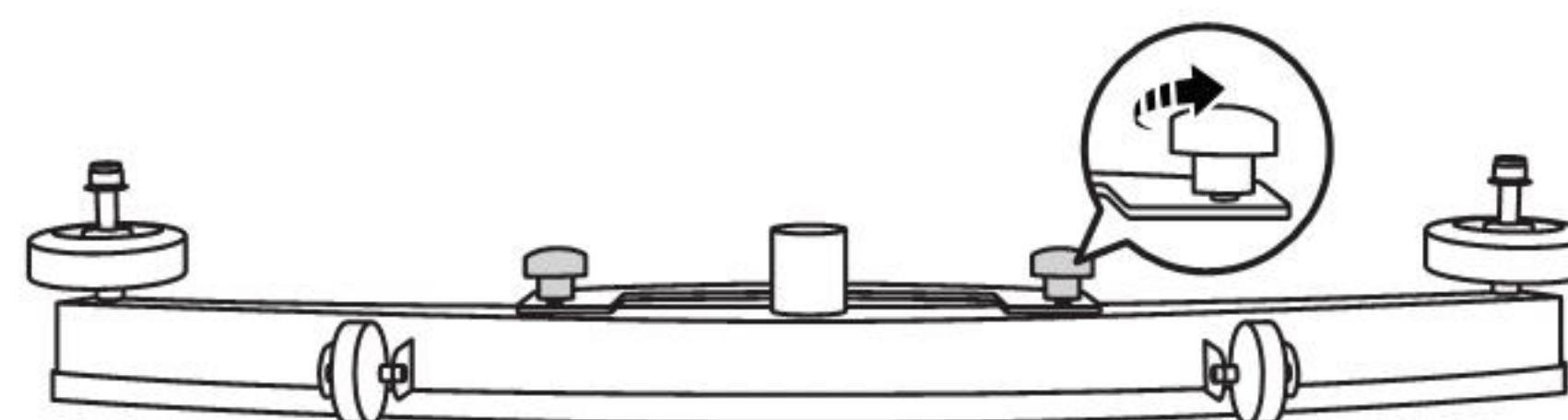


Structure of suction wiper components

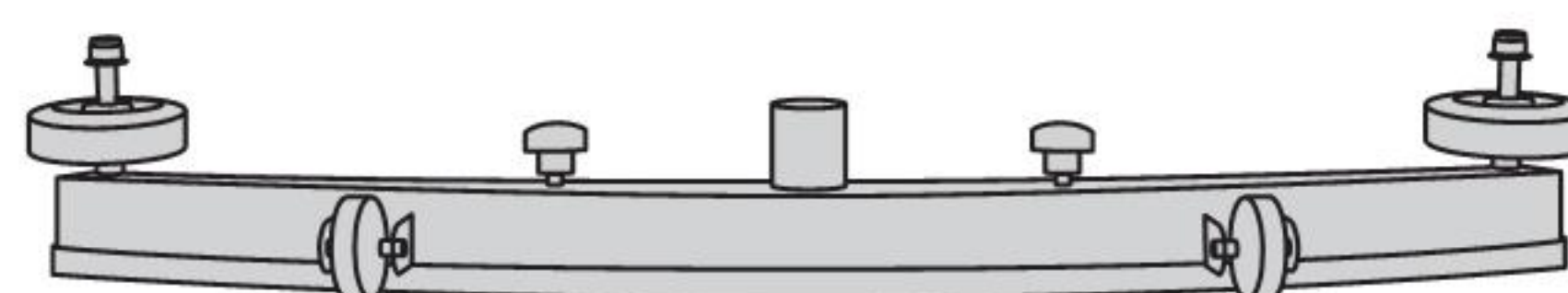
- 1 Disassembly the suction wiper:
  - a. The suction wiper is under the back of the machine. Firstly, please pull the sewage suction pipe off the suction wiper;



- b. The suction wiper was fixed by two manual nuts, and the nuts are loosened counterclockwise;

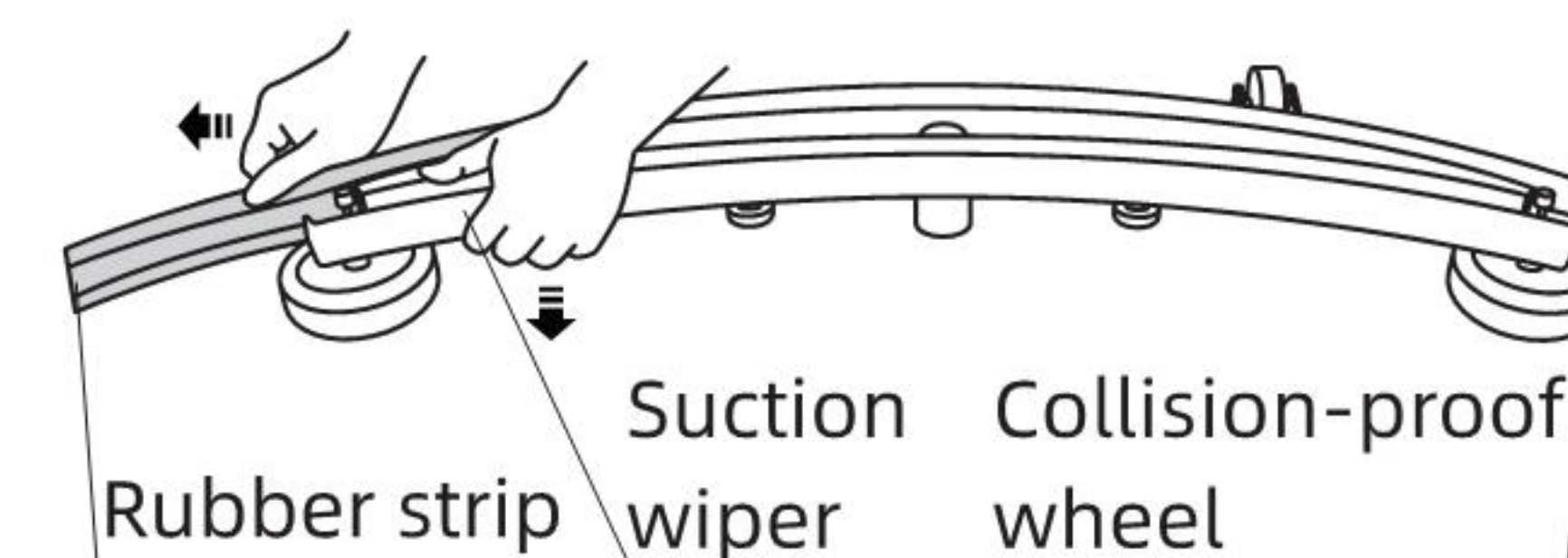


- c. The suction wiper can be easily pulled back.



- 2 Replace the rubber strip:

After removing the suction wiper, place the collision-proof wheel on the ground, press the suction wiper, pull out the rubber strip to the left / right, and then start to replace the rubber strip.



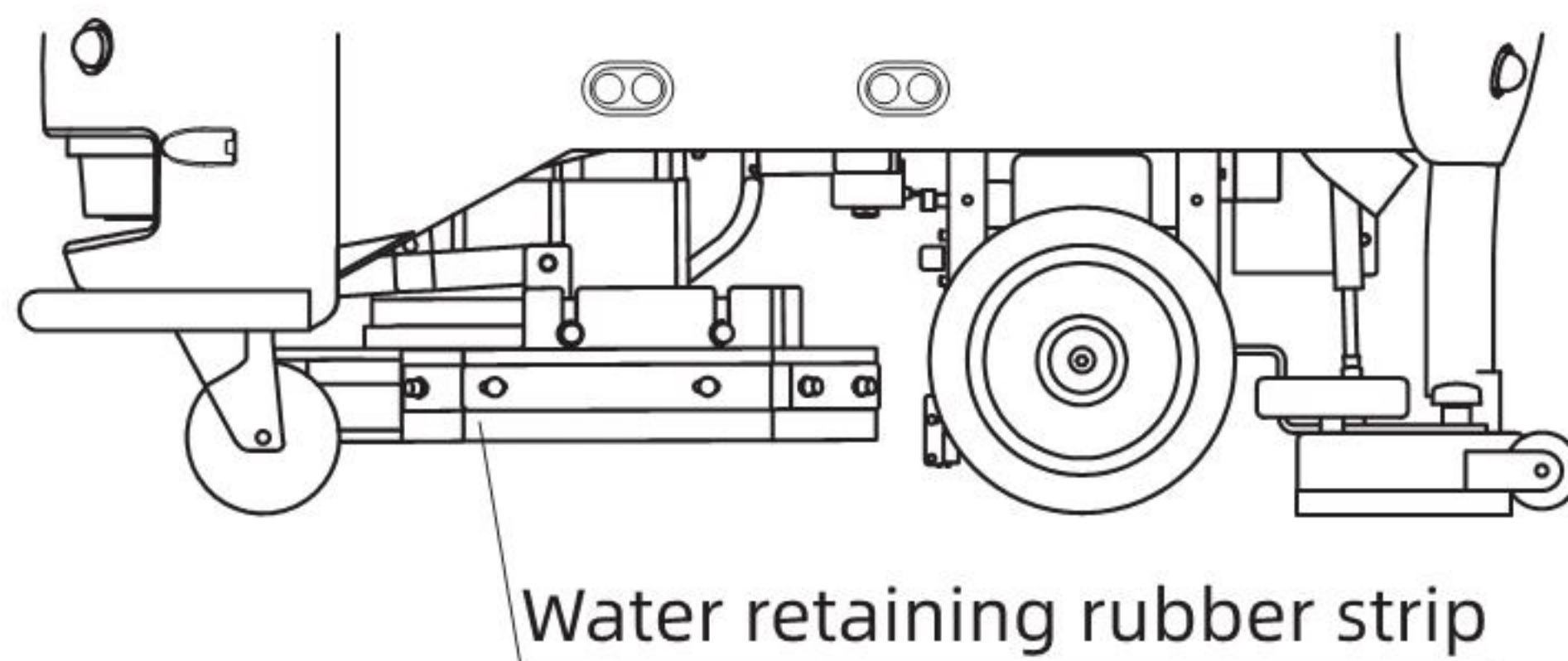
Please follow the previous steps to press the crash wheel and insert two rubber strips. Afterwards, install the sewage suction pipe and manually screw the nut until completed.



## Replace the cleaning brush disc

The brushes can be selected according to different scenes. At present, iTR has equipped the machine with floor pad and cleaning brush discs.

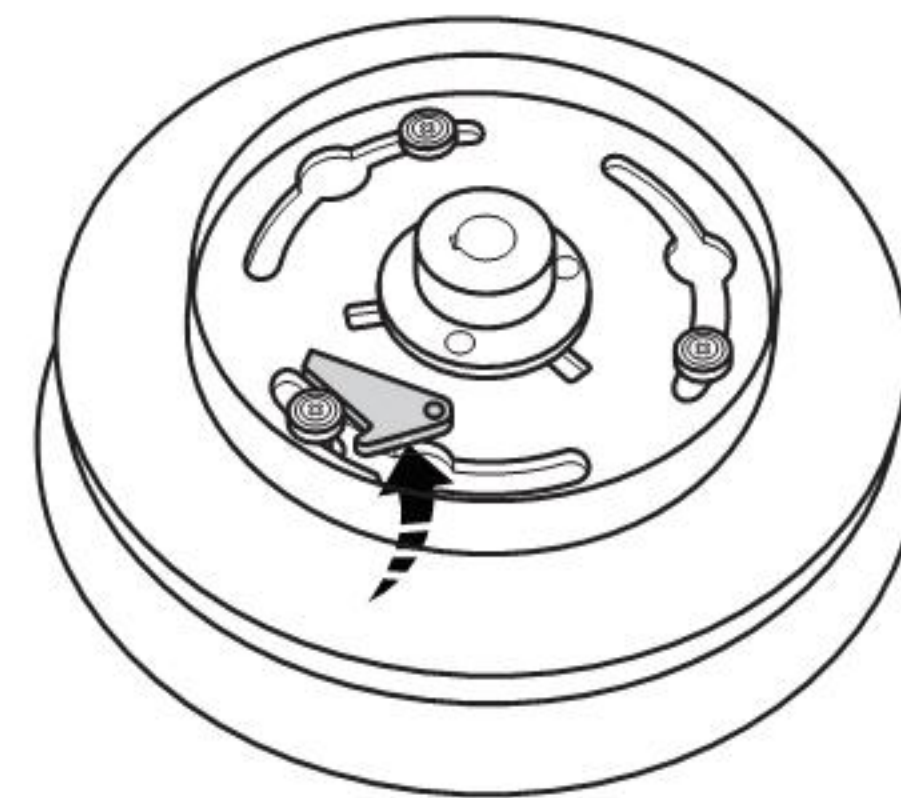
Floor pad is suitable for epoxy resin, granite and other scenes, which is suitable for marble, ceramic tile and other scenes.



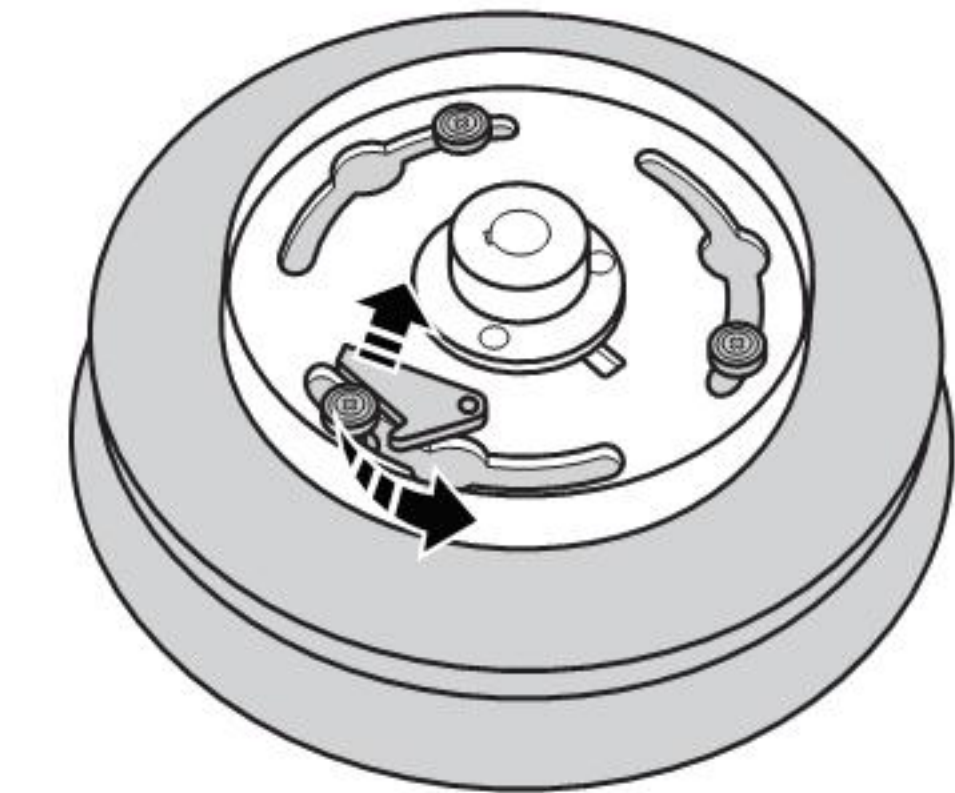
The brush disc is inside the water retaining rubber strip.

### 1 Remove the brush disc:

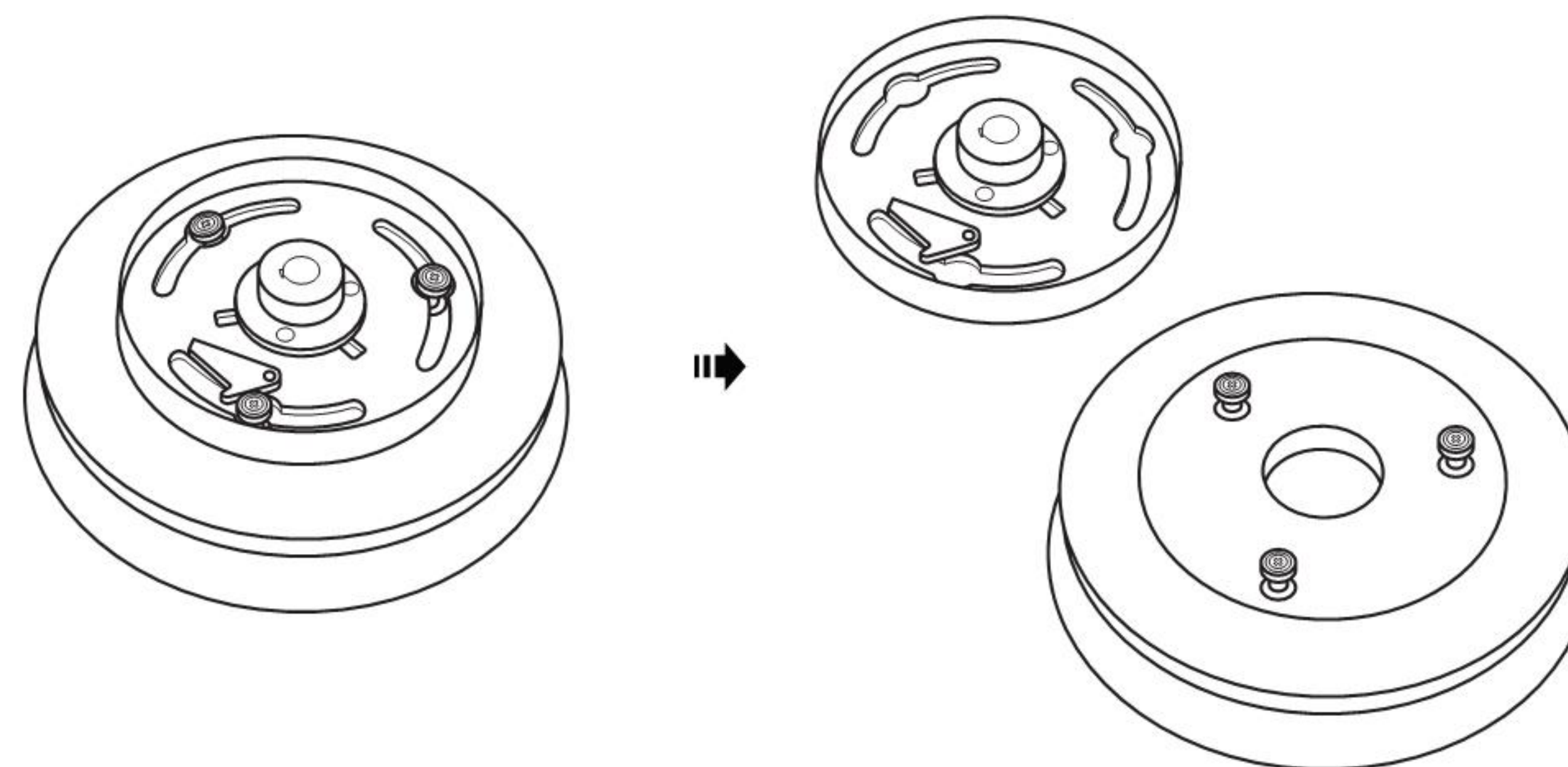
a. Manually rotate the brush disc and find the snap indicated by the arrow in the figure;



b. Press and hold the buckle indicated by the arrow in the figure, and manually rotate the brush disc to the notch position simultaneously;



c. After turning to the notch position, the brush disc can be removed.



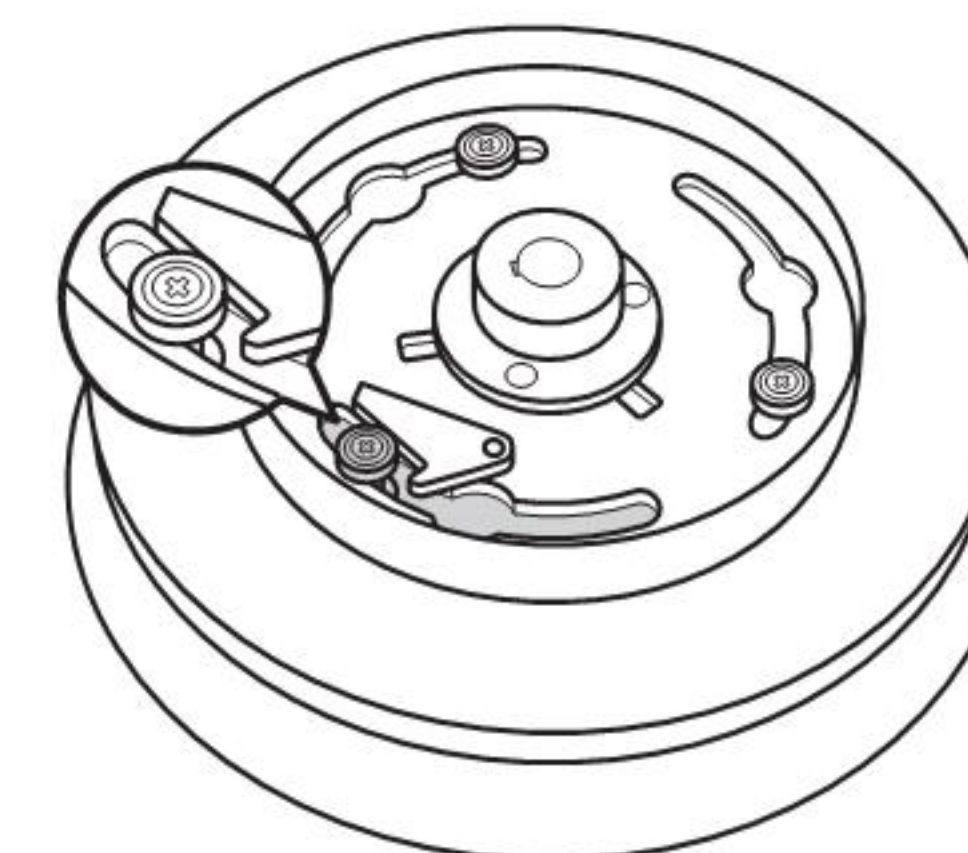
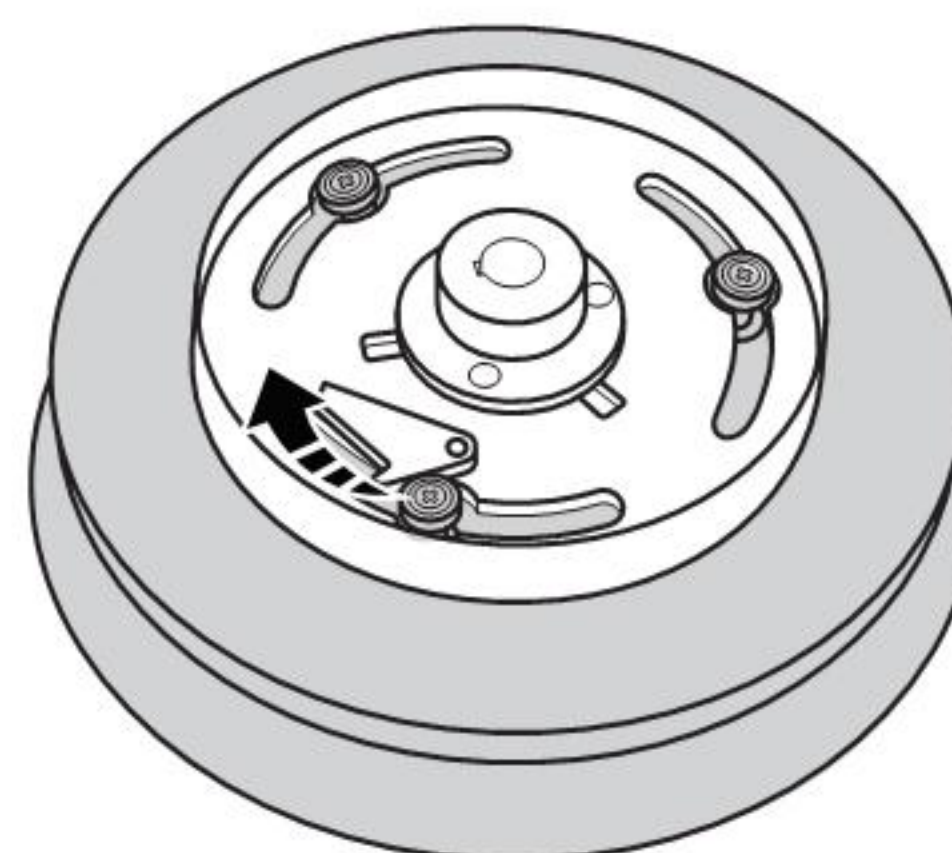
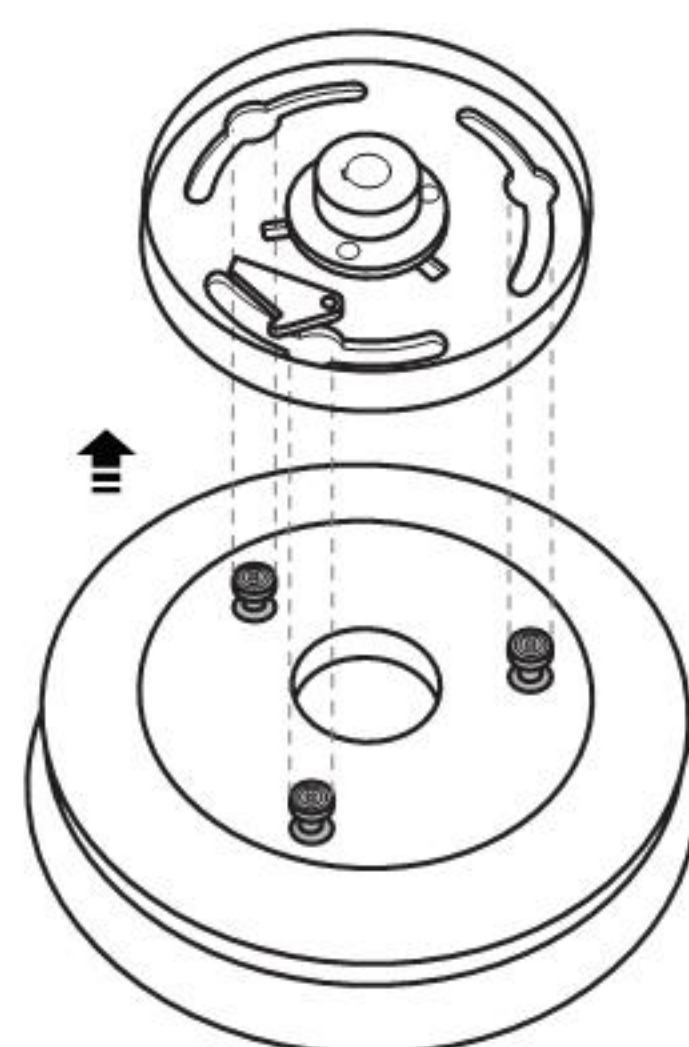


## 2 Install the brush disc:

a. First of all, please manually hold up the brush disc, align the three screws on the brush disc and put them into the hole on the fixed part of the brush disc;

b. Please press and hold the bayonet indicated by arrow in the figure, and manually rotate the brush disc to make the screw enter the range of the bayonet;

c. If the screw enters the position indicated by the arrow, it can be judged that the brush disc is installed perfectly.



### Note:

To ensure the normal operation of brush disc, you are kindly invited to check whether the brush disc is fixed firmly always.

### Method:

Manually rotate the cleaning brush disc repeatedly. If the cleaning brush disc does not fall, it means that the brush disc has been fixed firmly.

## Replacing floor pad

Please remove the brush disc before replacing floor pad. Regarding the method of removing brush disc, please refer the “Replacing the Cleaning Brush Disc” on page 63.