

# Operator Manual

## ANB450 Autonomous Scrubber Dryer

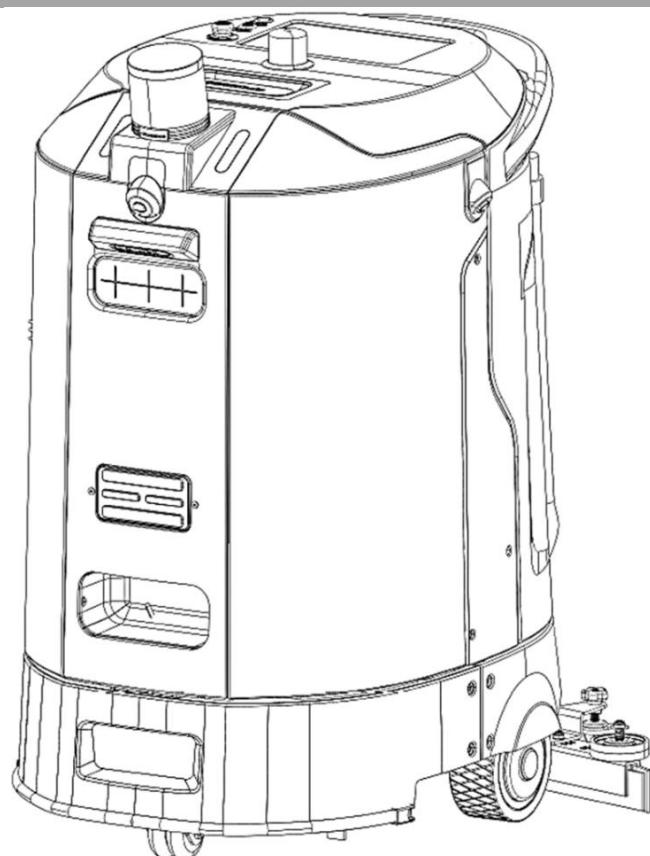


### WARNING

Do not use the scrubber before reading and understanding these operating instructions.

### NOTE:

- Please check the designation of your present type at the last page of this document as well as on the ID-plate.
- Keep this manual for future reference.



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ANB450-SMS-002

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## Introduction

This manual is only intended for end user and provides necessary information for operating the machine. It contains the safety, operations, maintenance and the specifications of the machine.



**CAUTION** Read all instructions before operating or maintaining this machine.

The machine will provide the optimal service, if:

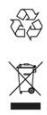
- Operate the machine properly.
- Maintain the machine regularly according to the maintenance instructions.
- Maintain the machine with manufacturer supplied or equivalent parts.

If you have questions about the instructions and explanations of this manual, please contact our company.

## Intended Use

ANB450 is an automatic drive, LFP battery powered, wide area used, AI-power scrubber dryer robot. This machine is intended for commercial use, for example in hotels, schools, hospitals, shopping mall, offices and rental businesses. It's designed to clean the hard floor (such as tile, wood floor, Concrete, terrazzo, Granite, etc.) in indoor areas.

## Environment Protection



Please dispose of packaging materials and used machine components such as batteries in an environmentally safe way according to your local waste disposal regulations.

## Machine Data Label

The model and serial number of the machine are shown on the nameplate which is located at the rear of the machine. This information is needed when ordering repair parts for the machine. Please note the machine model and serial number as below:

Model: _____
Serial Number: _____
Data of Purchase: _____



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## Uncrate the Machine

**⚠CAUTION: Do not move machine from the pallet without the ramp, or it may cause damage to the machine.**

When the machine is delivered, please check the packaging and machine carefully for any damage. If there is any damage, report to the carrier immediately. Contact the local dealer or our company directly for missing items.

## **Safety**

### **Important Safety Instructions**

#### **Save These Instructions**

There are three levels of hazard intensity identified by signal words -**WARNING** and **CAUTION** and **FOR SAFETY**. The level of hazard intensity is determined by the following definitions:

**⚠WARNING:** To warn hazards or unsafe practices which could result in severe personal injury or death.

**⚠CAUTION:** To warn hazards or unsafe practices which could result in minor personal injury or product or property damage.

**FOR SAFETY:** To identify actions which must be followed for safe operation of equipment.

#### **⚠WARNING: To reduce the electric shock, fire, explosion or injury:**

- Always read the manual and before using the machine for the first time.
- Do not use the machine in rooms where explosive or highly combustible substances (e.g., gas, solvents, heating fuel, dust, etc.) are stored or processed.
- Do not use the machine to clean flammable or combustible materials such as gasoline or alcohol.
- Do not use the flammable cleaner.
- Power off the switch and disconnect the charger cord before servicing the machine.
- Never touch the mains plug or socket with wet hands.
- Do not use or store the machine outdoors.
- The manual charger incorporates an earth connection for functional purposes and must only be plugged into an earthed socket-outlet.
- If the supply cord of the manual charger is damaged, it must be replaced with a cord provided by our company or by a qualified service agent in order to avoid hazards.

**⚠WARNING:** This machine is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge.

**⚠WARNING:** Children should be supervised to ensure that they do not play with the machine.

**⚠WARNING:** Do not disassemble or replace the battery without permission of the manufacturer.

**⚠WARNING:** Do not use the machine for transporting goods or carrying people.

**⚠WARNING:** Use accessories and consumables supplied or authorized by our company. The use of other accessories may impair safety.

**⚠WARNING:** To prevent the machine from entering sudden vertical drop areas such as small steps, stairs, escalators, etc., please use security barriers, railings, or obstacles as a safety measure.

**⚠WARNING:** Always follow the 'Battery Maintenance Precaution' section when using, storing and maintaining batteries.

**⚠CAUTION:** Do not over discharge the battery. Please recharge the battery when it is low on power.

**⚠CAUTION:** Only use the charger provided by our company to charge the machine.

**⚠CAUTION:** Do not turn off the machine by directly turning the load-break switch to "OFF" position to avoid possibility of the data loss or damage to the machine.

**⚠CAUTION:** Be aware of the weight of the machine during the transportation.

**⚠CAUTION:** Do not use forklift directly to pick up the machine, or use lifting rope to lift the machine. Do not use the handle of the machine as a fixed point.

**⚠CAUTION:** Be aware of the weight of the machine during the storage.

**⚠CAUTION:** Do not use solution above 45°C/113°F.

**⚠CAUTION:** Do not use this machine at altitudes exceeding 2000 m/6562 ft.

**⚠CAUTION:** If the machine is in auto mode or the emergency stop button is pressed, do not push the machine forcefully to avoid the possibility of machine damage.

**⚠CAUTION:** When updating the software, make sure the battery level is more than 30% and do not shut down the machine as it may cause damage to the system.

### FOR SAFETY:

1. Do not operate the machine,
  - Unless trained and authorized.
  - Unless the operator manual is read and understood.
  - Under the influence of alcohol or drugs.
  - Outdoors. This machine is for indoor use only.
  - On a slope in the automatic model.
  - While using a cell phone or other types of electronic devices.
  - If not in proper operating condition, including temperature, altitude and the material of the ground. Refer to the specifications.
  - In flammable or explosive areas.
  - In areas with possible falling objects.
  - If the accessories or consumables are not supplied or authorized by our company. Using other accessories may impair safety.
2. Before start up the machine:
  - Check machine for fluid leaks.

- If safety-relevant covers, such as disk brush deck, power supply cords, are damaged, stop the machine and report.
- Ensure that all covers are positioned in the designated locations as specified in the instructions.
- Please pre-sweep the floor.
- Remove any cables lying on the ground beforehand to prevent the robot from getting entangled.

3. When operating the machine manually

- Use it as described in this manual.
- Do not stop on slopes.
- Pay attention to the local situation, as well as to third persons and children. In the vicinity of blind spots such as doors or curves in particular, it is important to reduce speed.
- Reduce speed on the inclines and slippery ground.
- Go slowly on slopes and slippery surfaces.
- Use care when reversing machine.
- Do not transport other persons and objects with this machine.
- Keep children and unauthorized persons away from machine.
- Place the 'Caution: Floor Wet' sign on the ground in the operating area.
- Do not operate manually the machine on the ramp with a gradient exceeding 8%.

4. When using the machine in automatic mode

- Use it as described in this manual.
- Do not stop on slopes.
- Do not use in places with various moving vehicles, such as parking lots.
- Do not use the machine in areas surrounded by transparent glass or high-transparency objects, as well as in places with highly reflective surfaces.
- Pay attention to the local situation, it is important to reduce speed.
- Reduce speed on the inclines and slippery ground.
- Do not transport other persons and objects with this machine.
- Do not cover the machine sensors, as this will affect the normal operation of the machine.
- Do not run it in auto mode on the slope with a gradient exceeding 2%.

5. After using the machine:

- In order to prevent unauthorized use of the machine, the power source shall be switched off or locked, for example by removing the key of the main switch or the ignition key.
- Stop the machine on level ground.
- Machine that is left unattended should be secured to prevent unintended movement.

6. When maintaining the machine

- Turn off the machine and remove the key.
- Stop on the level ground.
- Do not jack up machine.

## **Safety**

- Do not work under a machine without safety blocks or stands to support the machine.
- Do not clean the machine with a pressure washer.
- Use accessories and consumables supplied or authorized by our company. The use of other accessories may impair safety.
- Do not dismantle the machine without permission. If you need service, please contact the local distributor.
- Do not use incompatible battery chargers as this may damage battery packs and potentially cause a fire hazard.
- Avoid moving parts, do not wear loose clothing or jewelry, and secure long hair.
- Do not use this charger in explosive environments.
- The charger is specifically designed for charging our company's robots. Do not use the charger to charge other devices.

7. When transporting the machine:

- Turn off the machine and remove the key.
- Drain the water tank before loading.
- Do not operate the machine on the ramp with a gradient exceeding 8%.
- Block the machine wheels well.
- Use tie- down straps to secure machine.
- Do not tilt or lay down the machine when transporting.

## **Safety Labels**

 A yellow rectangular warning label with a black border. Inside is a yellow triangle with a black exclamation mark. Below the triangle is the word 'WARNING' in a bold, sans-serif font. Underneath that is a smaller yellow triangle with a black silhouette of a hand being pinched by a gap, with the text 'CAUTION NIPPING HAND' below it.	Caution: watch your hand to avoid damage.
 A red circular prohibition sign with a black border. Inside is a black silhouette of a hand with the fingers spread. A diagonal line from the top-left to the bottom-right of the circle indicates that the action is prohibited.	Do not touch the device.
 A yellow triangular warning sign with a black border. Inside is a yellow laser symbol (a circle with a crosshair and a bright light at the center).	This is the Class 1 laser device and it's safe for the eyes.
 A standard recycling symbol consisting of three chasing arrows forming a triangle, with a small 'R' at the top.	Disposal
 A black rectangular symbol with a white 'X' over a trash bin. Below the bin is a thick black horizontal bar.	Do not throw used machine components to the bin.

## Know your Machine

### Overview of Appearance

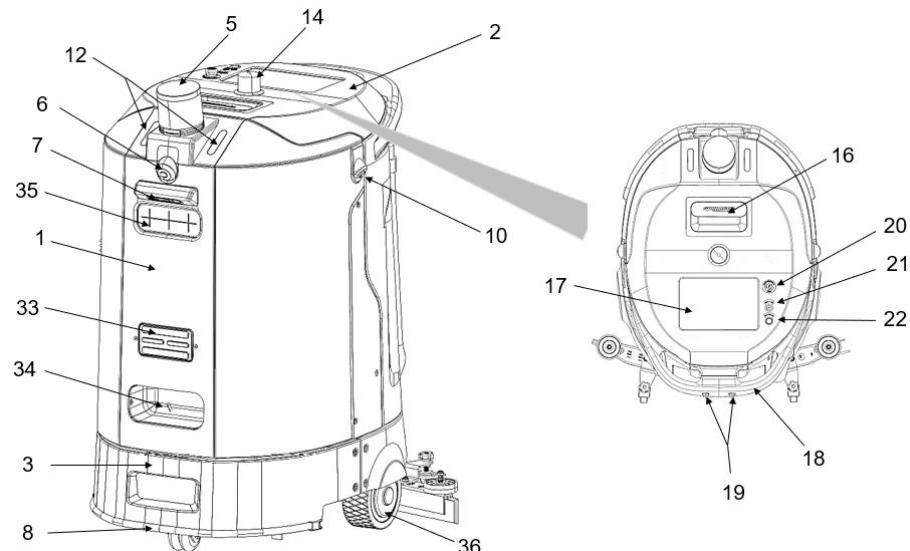


FIG.1

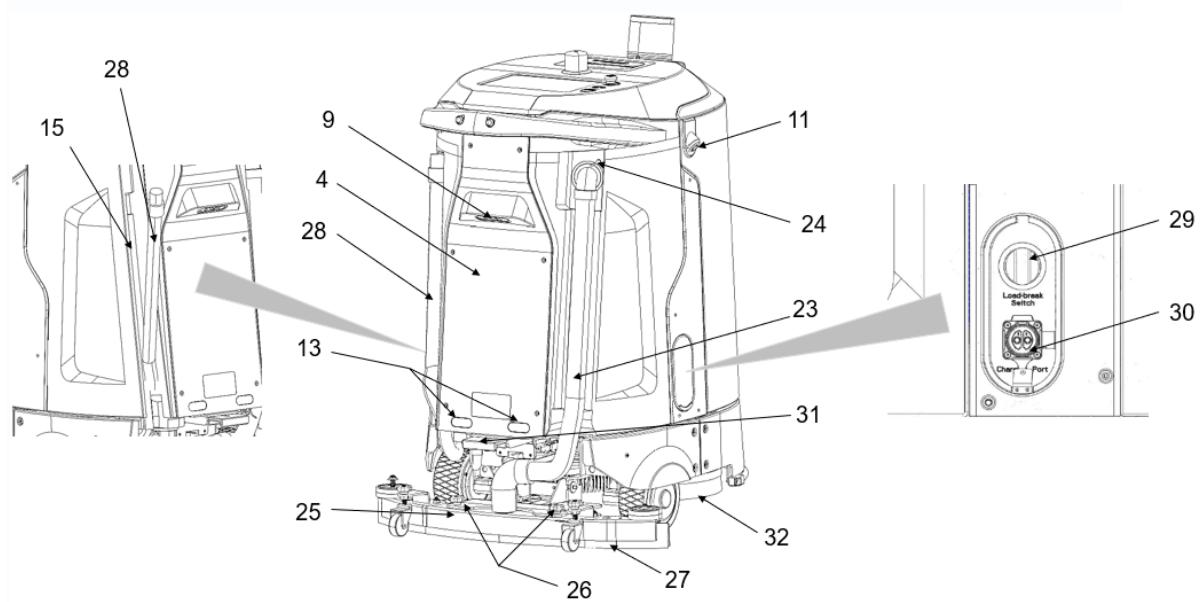


FIG.2

#### ● Covering Parts

1. Front cover	6. Front camera
2. Top cover	7. Front depth camera
3. Bumper	8. Bumper sensor
4. Rear cover	9. Rear depth camera
5. 3D LiDAR	10. Left camera
	11. Right camera

#### ● Sensors

## ● HMI & Operating parts

12. Front indicator light	24. Vacuum hose clip
13. Rear indicator light	25. Squeegee kit
14. Blinking light	26. Squeegee Retainer knob
15. Solution drain hose	27. Squeegee blade
16. Handle	28. Recovery tank drain hose
17. Touch screen	29. Load-break switch
18. Control Handle	30. Manual charging port
19. Power assist button	31. Pedal
20. Emergency stop button	32. Brush head
21. Key switch	33. Auto charging port
22. Auto/Manual switch button	34. Auto draining port
23. Vacuum hose	35. Auto filling port
	36. Drive wheel

## Indicator light introduction

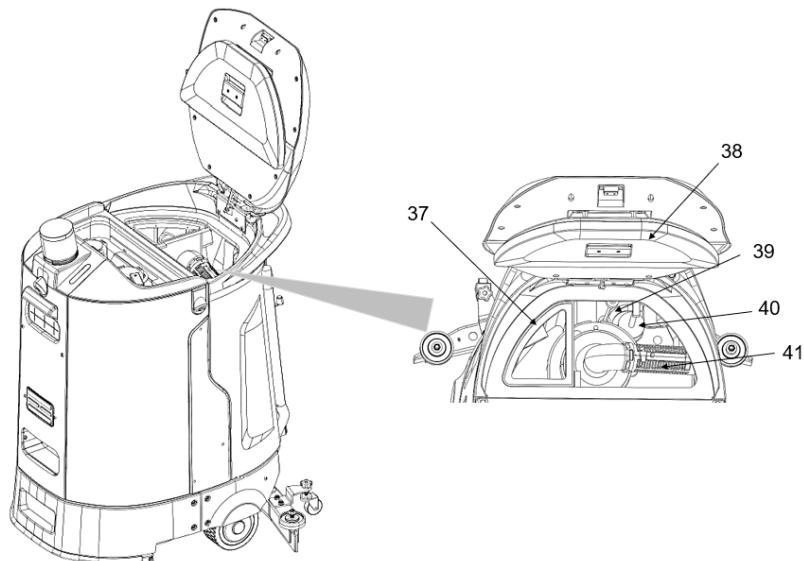
Indicator (12 & 13): Indicators are in the front and rear of the machine. They show the working status and the turning direction of the machine.

Indicator Light	Description
Green	Machine is executing the task.
Red	The emergency stop button is pressed.
Red flash	Machine error.
White	Machine is idle.
White flash	Machine is charging.

## Sensor introduction

- 3D LiDAR (5): CLASS 1 laser. Used for mapping, localization and obstacle avoidance.
- Front camera (6): Used for floor stain and obstacle detection.
- Front depth camera (7): Used for obstacle avoidance and localization.
- Bumper sensor (8): Used for collision detection.
- Rear depth camera (9): Used for obstacle avoidance and positioning when docking.
- Left camera (10): Used for obstacle avoidance.
- Right camera (11): Used for obstacle avoidance.

### Recovery Tank



**FIG.3**

37. Debris filter bag	40. Filter
38. Recovery tank lid	41. Recovery tank shut-off float
39. Recovery tank float sensor	

Debris filter bag (37): Filter debris to prevent clogging of the drain hose.

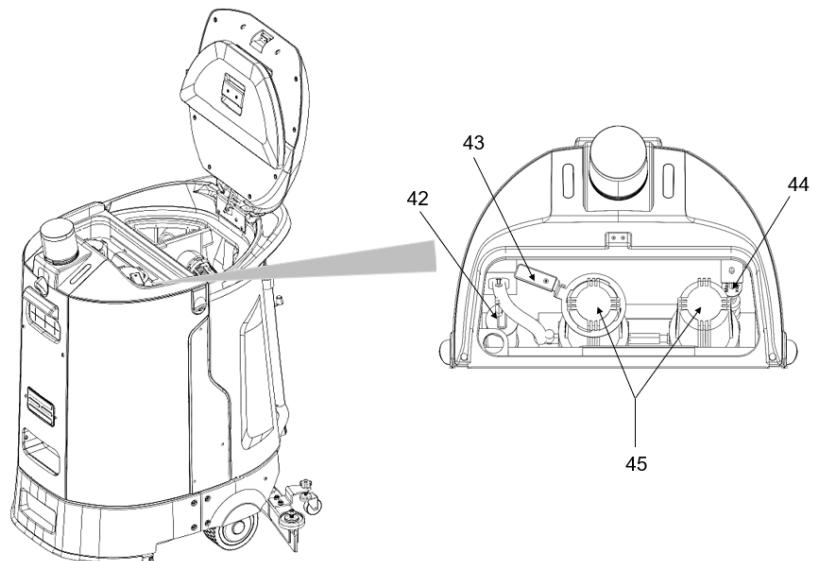
Recovery tank lid (38): Seal the recovery tank. The lid can be hanged from the machine top cover.

Recovery tank float sensor (39): Detect the water level in the recovery tank.

Filter (40): Prevent the drain hose from clogging.

Recovery tank shut-off float (41): Prevent the waste water from entering the vacuum motor if the float sensor fails.

### Solution Tank



**FIG.4**

42. Solution tank filter

44. Solution tank float sensor

43. Tool (Optional)

45. Filter elements (Optional)

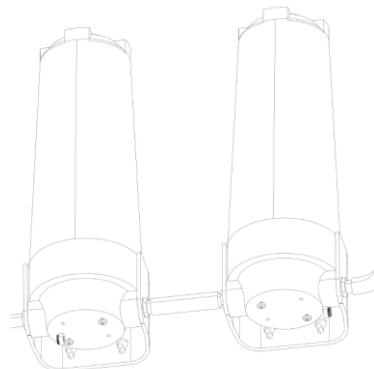
Solution tank filter (42): Prevent the valve from clogging.

Tool (43): It is a tool for removing elements.

Solution tank float sensor (44): Detects the water level.

Filter elements (45): They are filters for the water recycling system.

**Note:** This machine is equipped with water recycling system and it is optional as shown in FIG.5. Equipped with this feature, significant water savings have been achieved, aligning with the goals of sustainable development.



**FIG.5**

### Control Panel

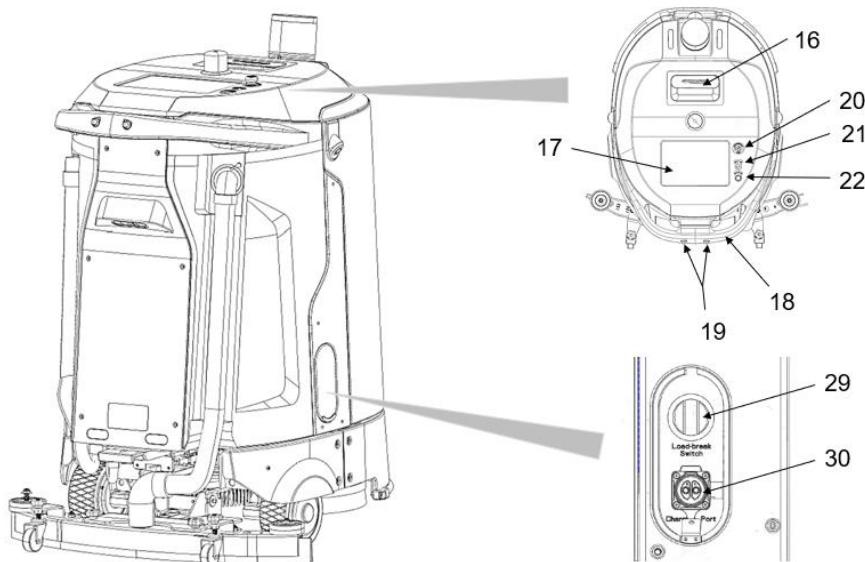


FIG.6

#### 1. HANDLE (16)

The handle is located at the top of the machine. It is used for opening the machine top cover. The water tanks are below the top cover.

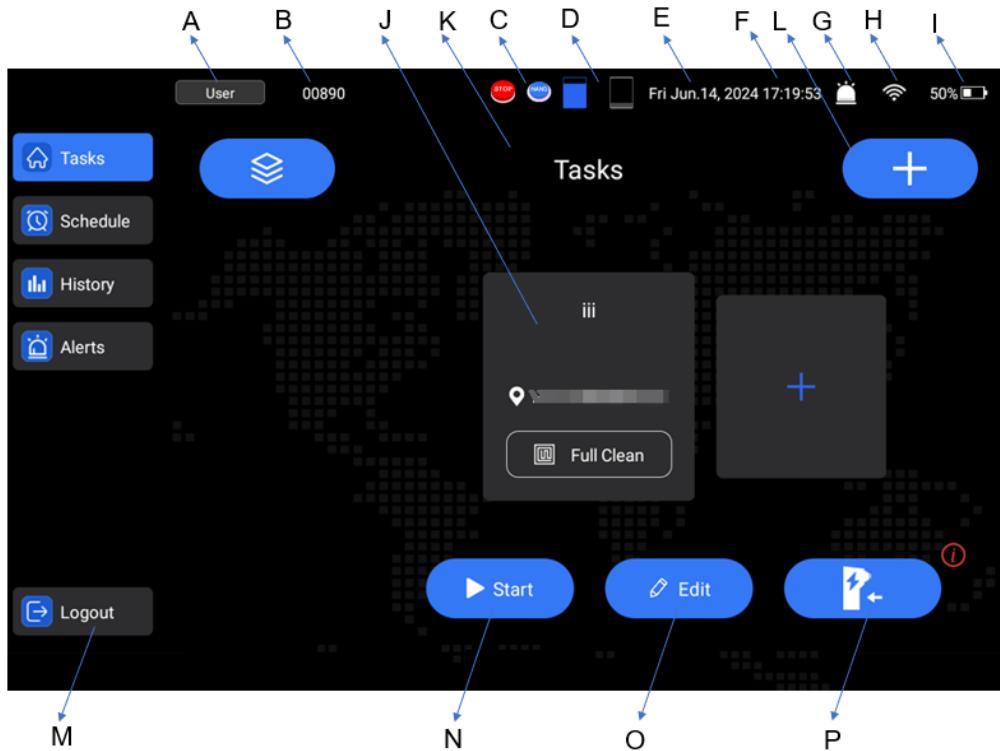
#### 2. TOUCH SCREEN (17)

The User Interface (UI) is an essential component of the machine, consisting of a 10.1-inch touchscreen display located at the top. It enables operators to conveniently access features such as machine instructions, cleaning schedules, cleaning reports, and performance monitoring.

**Note:** The UI interface of the screen may change with software updates. If you have any questions, please contact local dealer for technical support.

#### Homepage

The homepage is the main page on the monitor. This page can display the task details and some common operations, such as pausing, ending, creating temporary tasks, etc.



**FIG.7**

A. Account	I. Battery level
B. Machine model and ID	J. Set tasks
C. The E-stop status and operation mode	K. Cleaning mode and status
D. The water tanks level	L. Create a temporary task
E. Date	M. Account logout
F. Time	N. Start the task
G. Warning notice	O. Edit the tasks
H. Network	P. Return to the docking station

#### Notice:

- The emergency stop icon is shown on the screen only after it has been pressed.
- The 'HAND' icon is shown on the screen only in manual mode.

#### Schedule Page

This page can display and modify the settings of scheduled tasks, as well as the execution status of past tasks.

## Know your Machine

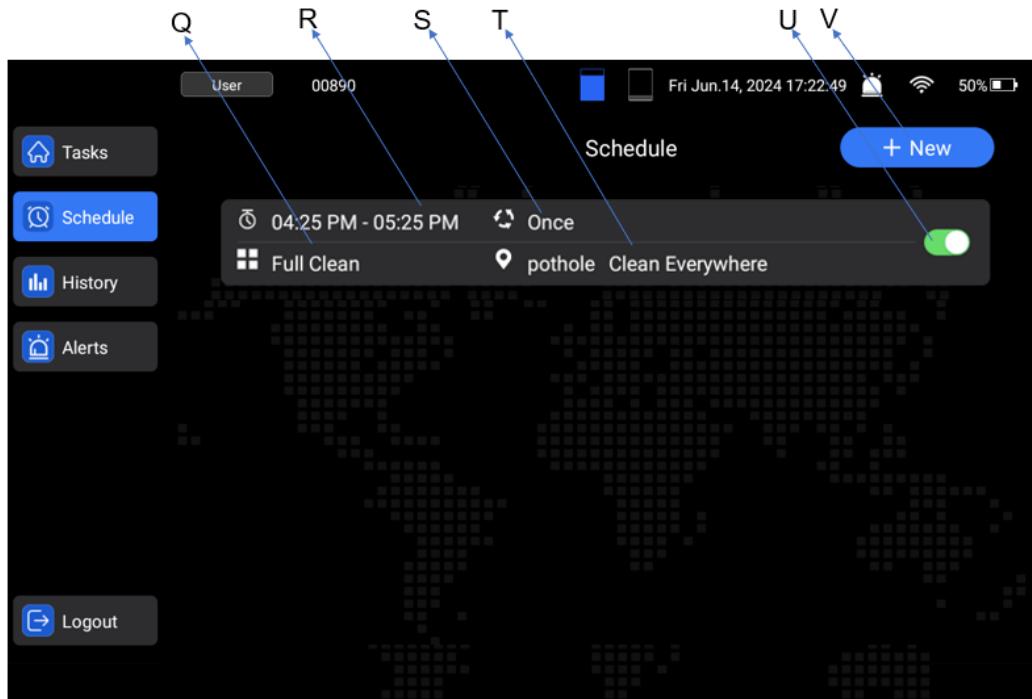


FIG.8

Q. Cleaning mode of the task	U. Task execution button
R. Start and end time of the task	V. Create new scheduled tasks
S. Number of cleaning repetitions	
T. The location of the map	

### History Page

The “History” page shows the past cleaning task reports.

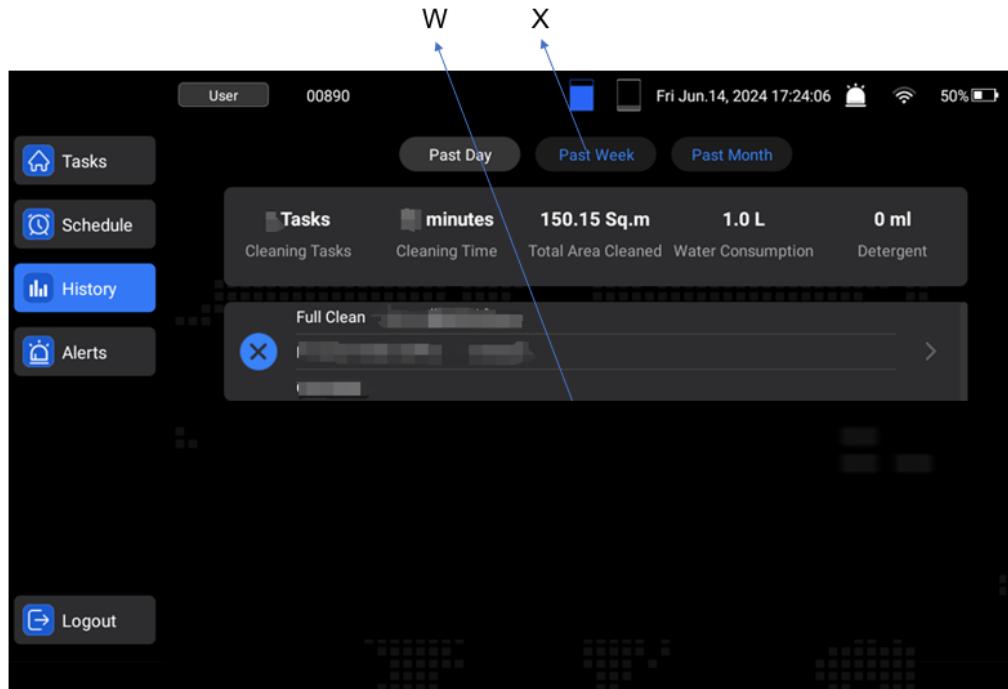


FIG.9

W. The detail of the task	X. Report interval selection
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## Alert Pag

This page displays the details of the alert, and the “Clear” button is for clearing the errors.

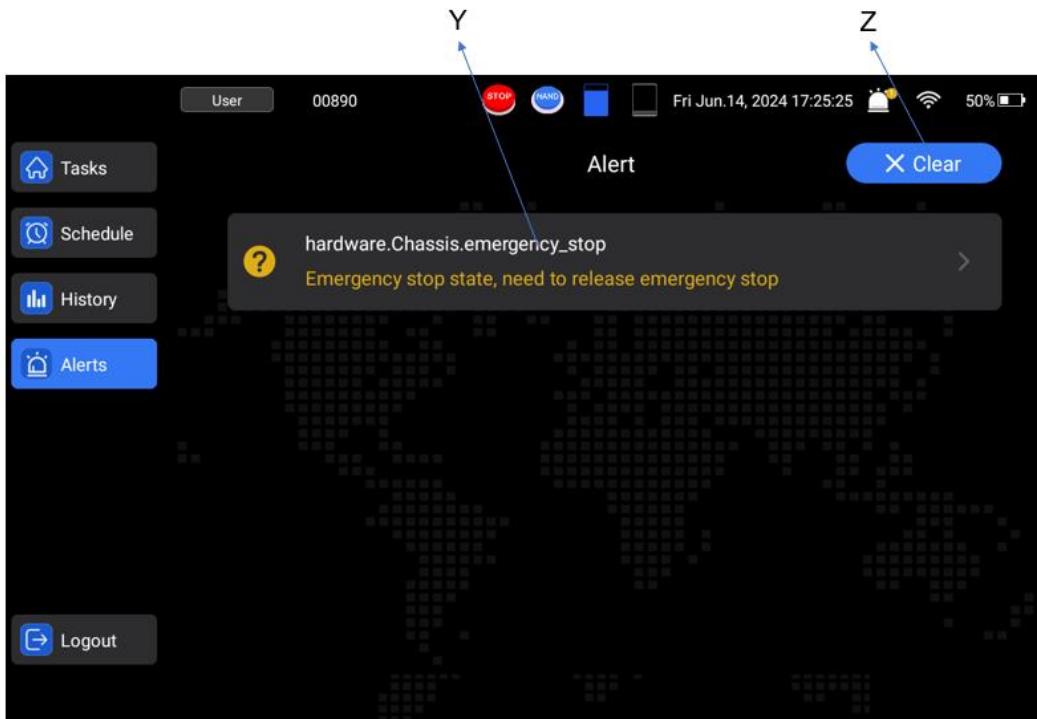


FIG.10

Y. Area of showing the alert code

Z. Clear errors

## 3. CONTROL HANDLE (18)

The handle is located at the rear top of the machine, and is used for manually pushing the machine.

**⚠️CAUTION:** If the machine is in auto mode or the emergency stop button is pressed, do not push the machine forcefully to avoid the possibility of machine damage.

## 4. POWER ASSIST BUTTONS (19)

This machine is equipped with two assist buttons. When the operator presses buttons in the manual mode, the robot gains the power to move. It enables the operator to easily control the machine and effectively clean the floor.

When both buttons are pressed, the machine can be pushed easily (the direction can be select on the touch screen).

**Notice:** The power assist feature is only effective in manual mode.

## 5. EMERGENCY STOP BUTTON (20)

The emergency stop button which is yellow-backgrounded and red is located on the top of the machine. It is used for emergency stop of the machine. Upon pressing it, the

machine will initiate the stop function, causing the drive wheel and brush motor to cease operation. If the emergency stop button is pressed while the machine is performing a cleaning task, the vacuum motor will briefly run before coming to a stop to minimize residual water on the floor.

When the emergency stop button is pressed, the 'STOP' icon will be displayed on the screen. To release the emergency stop button, rotate it clockwise.

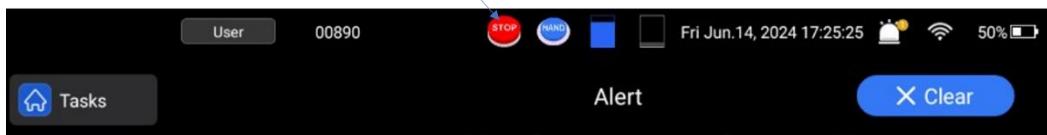


FIG.11

**⚠ CAUTION:** If the machine is in auto mode or the emergency stop button is pressed, do not push the machine forcefully to avoid the possibility of machine damage.

### 6. KEY SWITCH (21)

The key switch that controls the power of the machine is located at the rear top of the machine. When the switch is turned to the “ON” position, the machine will power on (make sure the load-break switch is also in the “ON” position). When the switch is turned to the “OFF” position, the machine will power off after a delay of about 30 seconds.

**Notice:** After the operator leaves the machine, please remove the key and keep it in a safe place to avoid loss.

### 6. AUTO/MANUAL SWITCH BUTTON (22)

This machine has two operating modes:

- **Autonomous Mode:** The autonomous mode is used to automatically scrub the floor. The machine will perform tasks at scheduled times and can also be called upon to perform temporary cleaning tasks by setting up temporary tasks.
- **Manual Operation Mode:** The operator can manually operate this machine to scrub the floor in this mode.

These modes can be switched by pressing the A/M button. If the button displays a blue light or the ‘HAND’ icon is displayed on the touch screen, it indicates that the machine is in the manual mode.

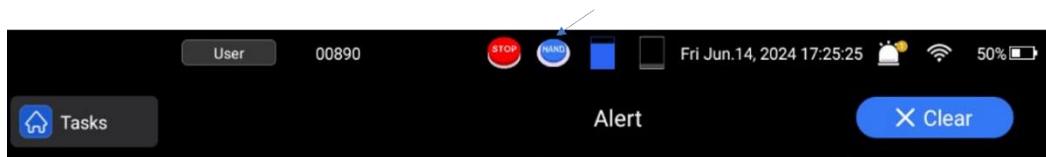


FIG.12

### 7. LOAD-BREAK SWITCH (29)

When servicing (by the trained personnel) or storing the machine, please turn the switch to 'OFF' position.

### 8. PEDAL (30)

When pushing the machine, it is easier to cross the obstacle or the step by stepping on the pedal.

## Docking Station

There are two types of docking stations: the charging station, which only has the auto charging feature for the machine, and the workstation, which has additional features such as auto water filling, auto detergent filling, and auto water draining. By being equipped with these features, human intervention has been greatly reduced, resulting in increased efficiency of the machine.

The docking stations are optional.

## Charging Station

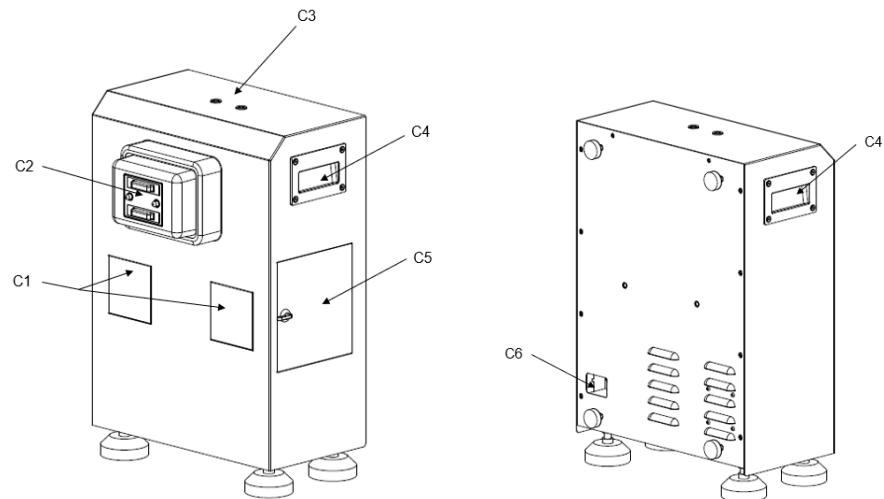


FIG.13

- C1 QR code
- C2 Auto charging port
- C3 Indicator light

- C4 Handle
- C5 Left door
- C6 Power switch and cord connector

## Workstation

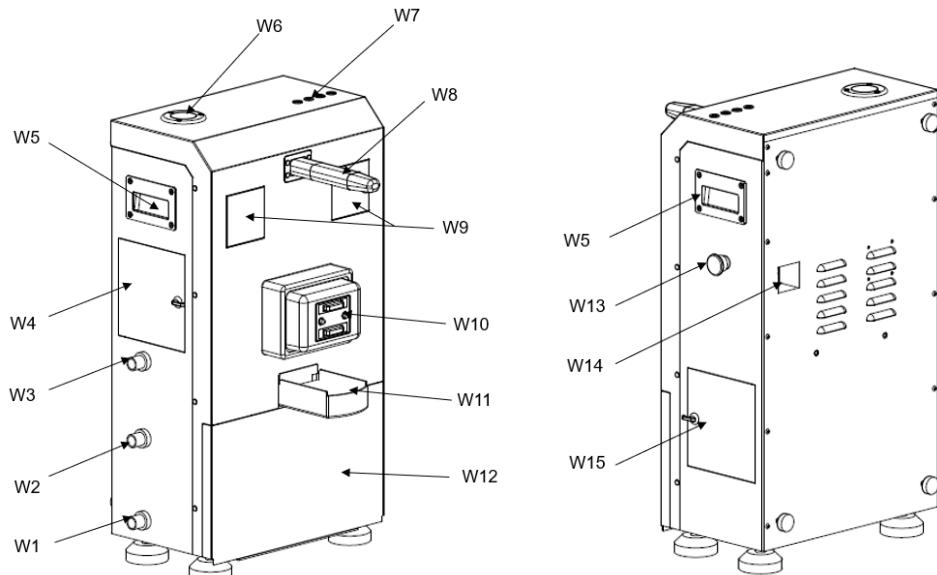


FIG.14

W1	Water outlet 1	W9	QR code
W2	Water outlet 2	W10	Auto charging port
W3	Water inlet	W11	Auto water draining port
W4	Right door	W12	Front cover
W5	Handle	W13	Emergency stop button
W6	Detergent tank	W14	Power switch and cord connector
W7	Indicator light	W15	Left door
W8	Auto water/detergent filling port		

### Special Instructions

- Station water tank: Used for buffering waste water when draining.
- Left door: Air switch is located behind the door.
- Right door: Nozzle and manual valves are behind the door.
- Front cover: Station recovery tank cover.
- Emergency stop button: Used for immediate termination of all tasks. If pressed, all the tasks are stopped and need to be released by turning it clockwise.

# Operation

The main purpose of this chapter is to provide the necessary operating instructions for the operators.

**Note:** The UI interface of the screen may change with software updates. If you have any questions, please contact local dealer for technical support.

## Starting Machine

Turn the machine power on by turning the key switch to 'ON' position. The load-break switch must be in the 'ON' position, or machine cannot be turned on.

**Notice:** After 7 days of storage, the battery will enter a dormant state automatically, and the machine can't be turned on using the key switch. Please use the charger to activate the battery.

When the machine is turned on and the UI is fully loaded, the login page will be presented first on the touch screen. There are two types of accounts on the login page: 'User' and 'Admin'. The 'User' account is for normal users to perform basic operations such as starting cleaning tasks, setting cleaning schedules, and viewing the cleaning report, among others. The 'Admin' account is for advanced operations such as map scanning, managing configurations, and adjusting cleaning parameters, among others.

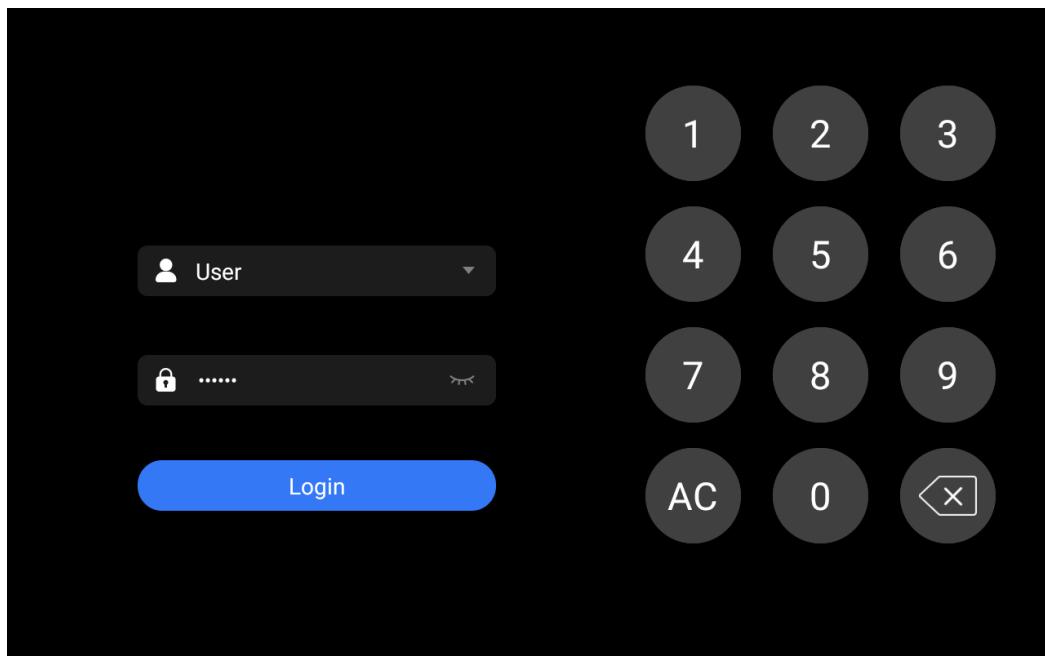


FIG.15

### Selecting the Map

After login, select the right map and tap 'Confirm' to enter the next step.

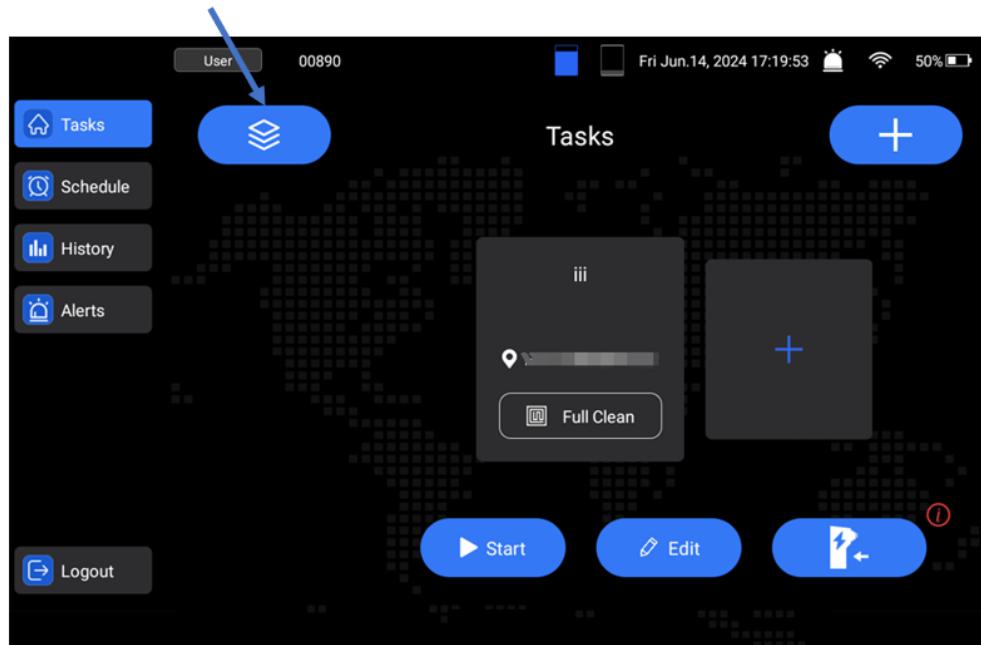


FIG.16

### Setting Scheduled Cleaning Tasks

1. Tap the 'Schedule' button on the left side of the screen interface.
2. Tap the '+New' button on the top right.
3. Set the starting time, ending time, cleaning dates, cleaning mode, select the map, etc.
4. Save the settings.

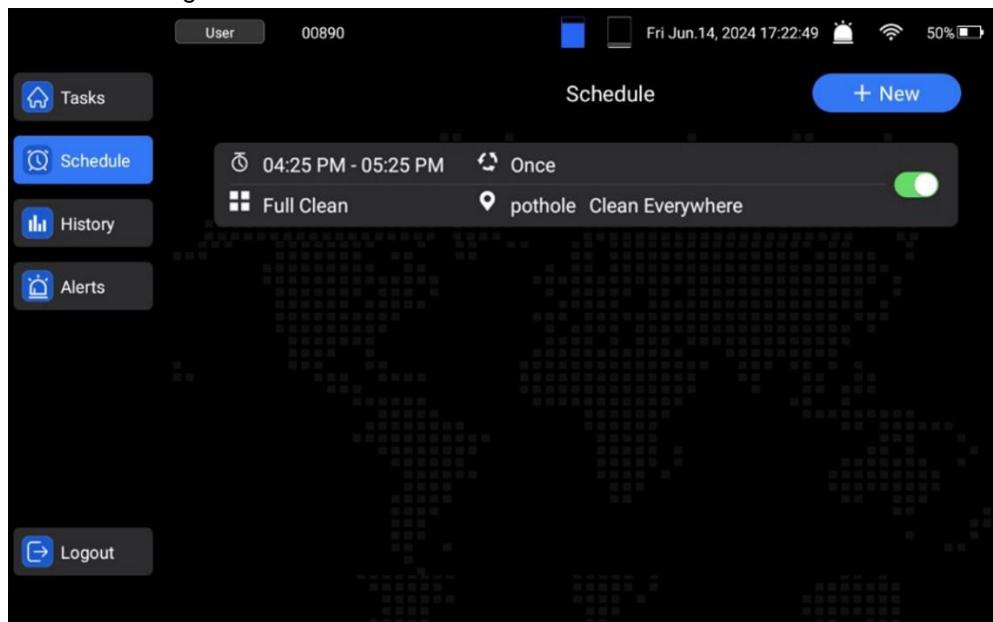


FIG.17

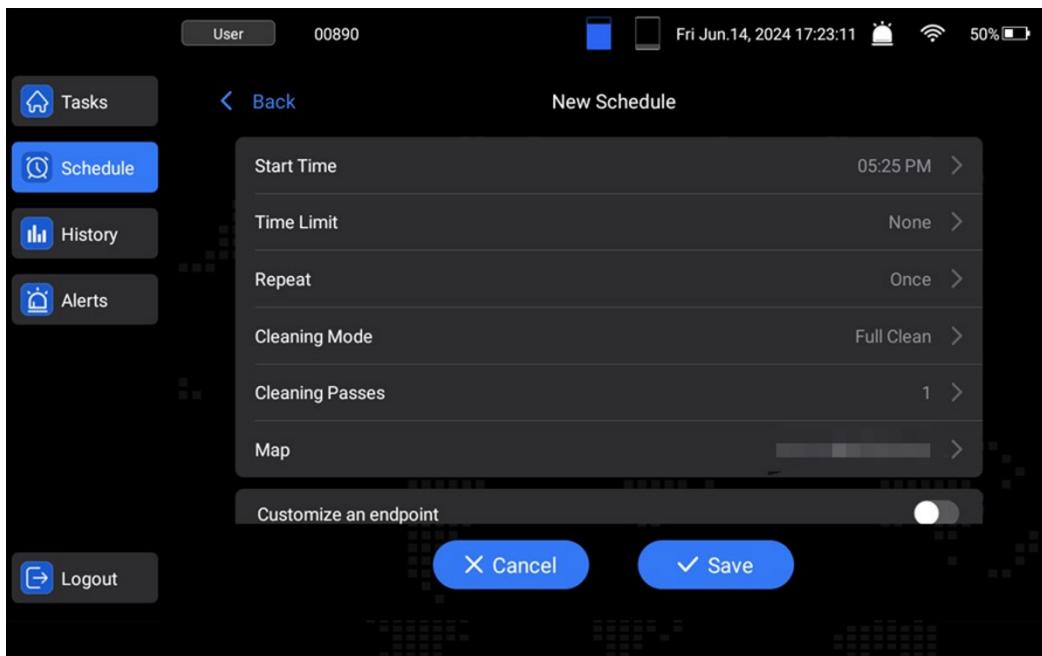


FIG.18

- Start Time: The task will be triggered to start at the designated 'Start time'.
- Time Limit: Task will end after the selected time.
- Repeat: The machine will do the cleaning repeatedly on the selected dates.
- Clean Mode: There are multiple options available for selecting different levels of cleaning intensity.
- Cleaning Passes: The number of times the area needs to be cleaned in a single task.
- Customize an endpoint: The cleaning robot will return to the customized endpoint after finishing the cleaning task.
- Clean Everywhere: If the button is disabled, the machine will only clean the selected areas. If the button is enabled, the machine will clean the entire map area.

## Starting a Temporary Cleaning Task

1. Tap '+ New' button on the homepage to create a temporary task.
2. Select the ending time, cleaning mode, map, cleaning areas, etc.
3. Tap the 'Start' button to begin the task.

Custom: Customization will only be valid once and will not be saved.

**Notice:** The explanations for the 'Limited time', '**Clean Mode**', '**Cleaning Passes**', '**Customize an endpoint**' and '**Clean Everywhere**' can be found in the chapter titled '**Setting Scheduled Cleaning Tasks**'.

**Notice:** The cleaning area can be selected from the saved area or customized by tapping '**Custom**'.

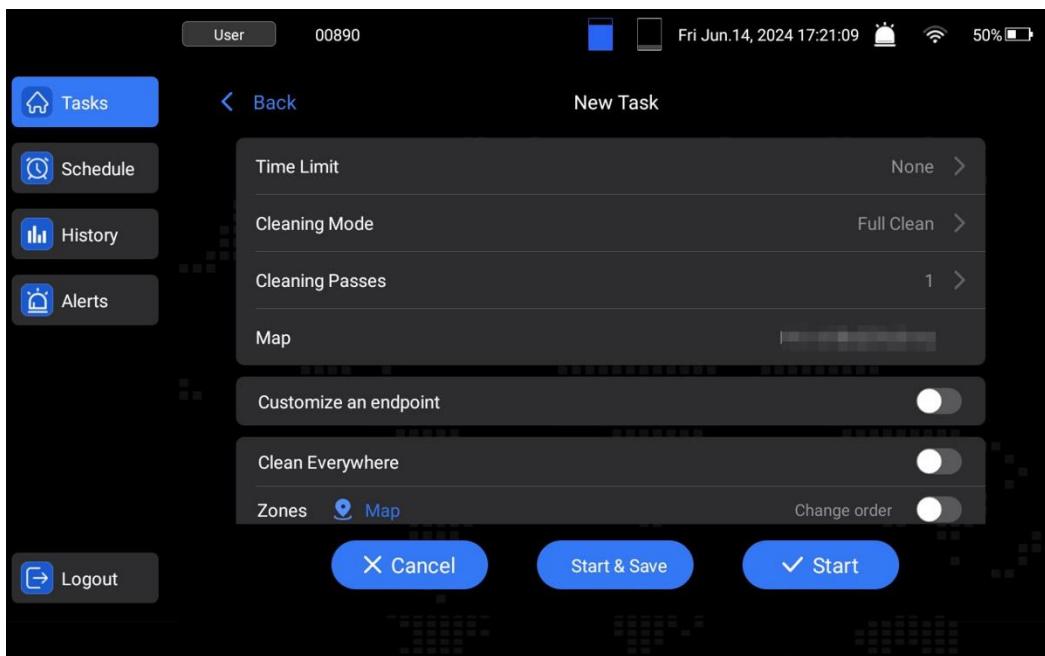


FIG.19

## Checking the Alert

If there is a numerical display on the 'Warning notice light' (G) on the homepage, it means that the machine has warnings or errors.

1. Tap the '**Alert**' on the home page.
2. Check the warnings or errors. Follow the provided tips or refer to the '**Troubleshooting**' chapter.
3. Tap the '**Clear**' button in the right top position. If the machine still fails to function properly, contact the dealer directly.

**Notice:** Errors will cause the machine to stop, while warnings will not.

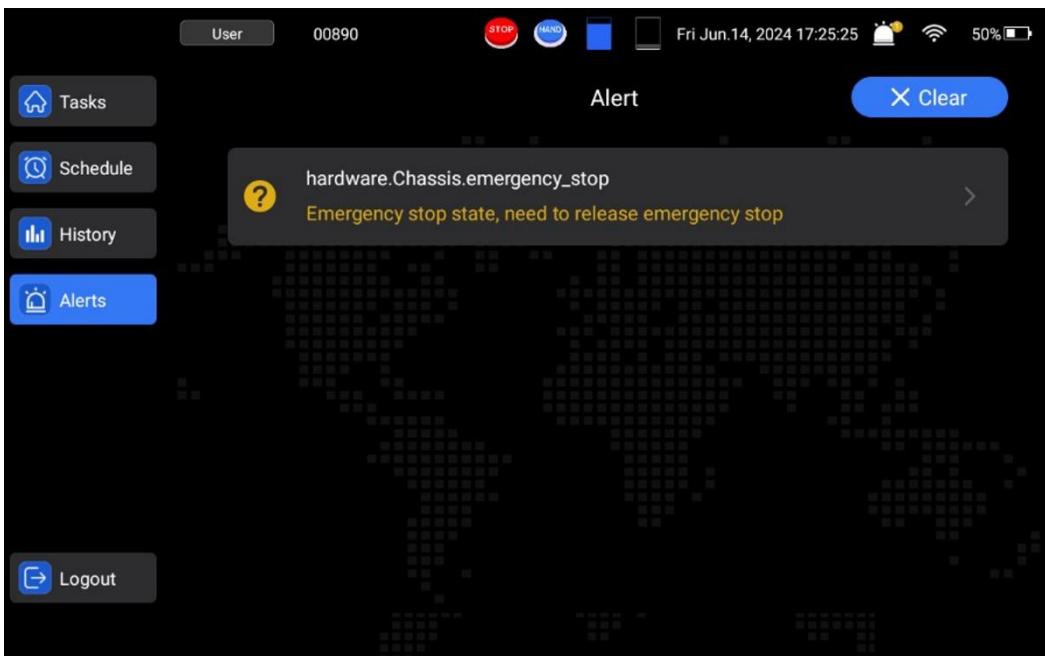


FIG.20

## Stopping the Machine

There are several ways to stop the machine.

### 1. Press the emergency stop button

Upon pressing it, the machine will initiate the stop function, causing the drive wheel and brush motor to cease operation. If the emergency stop button is pressed while the machine is performing a cleaning task, the vacuum motor will briefly run before coming to a stop in order to minimize residual water on the floor.

### 2. Pause the task

When the machine is executing a task, tap on the homepage to pause it, and the machine will stop in place. After tapping resume task icon, the task will resume.

### 3. End the task

When the machine is executing a task, tap on the Homepage to end the task. Then the machine will return to the docking station automatically.

**For Safety:** Do not stop the machine on slopes.

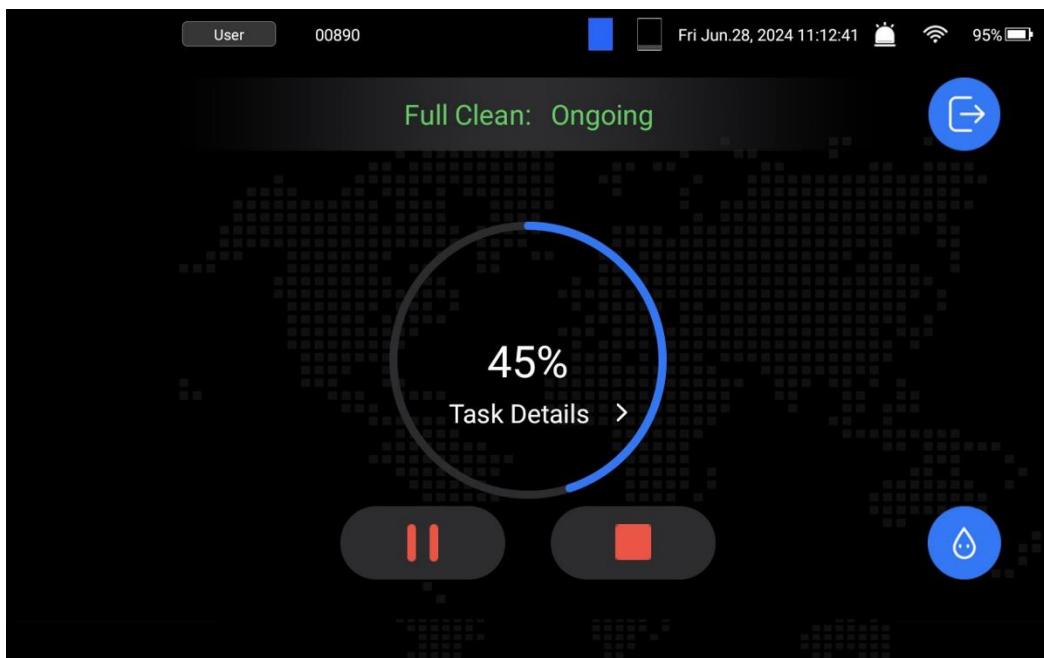


FIG.21

## Turning off Machine

Turn off the machine using the key switch. After turning the key switch off, the brushes and squeegee will lift to the raised position if they are in the low position. Then, the machine will power off in a few seconds.

**⚠ CAUTION:** Do not turn off the machine by directly turning the load-break switch to “OFF” position to avoid possibility of the data loss or damage to the machine.

**For safety:** Before turning off the machine, stop the machine on the level ground.

## Operating the Machine Manually

**For safety:** Do not operate the machine on the slope that exceeds 8%.

When machine needs to be operated or moved manually, there are two ways it can be operated.

1. Switch to the manual mode

To activate the manual mode of the machine, press the A/M button on the control panel when machine is idle or when the emergency stop button has been pressed. If the A/M button illuminates with a blue light, it indicates that the machine is now in manual mode and can be operated.

**Notice:** If the emergency stop button is pressed, the machine can't be operated, even in manual mode.

## Operation

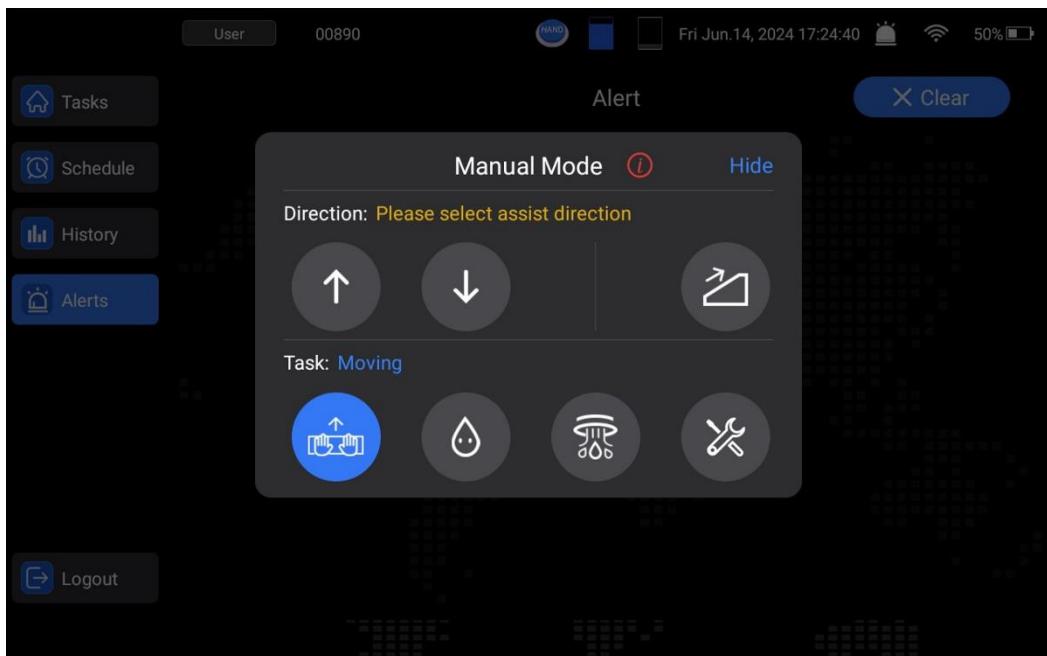


FIG.22

The instructions of the 'Manual Mode' page are below:

**Direction:** Tap the left icon, the direction of power assist will be forward and press the assist button, the machine will provide a forward force. Tap the right icon, the direction of power assist will be backward and press the assist button, the machine will provide a backward force.

 : It is recommended to use it on slopes or to cross small steps. When activated, the machine will provide greater power assistance.

### Task:

- Moving: In this mode, the machine will not perform any cleaning. The squeegee and the brush are in the raised position.
- Scrubbing: The flow of the solution and vacuum power can be selected in this mode.
- Clean Residual Water: The machine performs the vacuuming task and the brushes are in the raised position.
- Maintenance: The squeegee will lower and the vacuum motor will work. It is also used to clean the vacuum hose.

### Hide:

This page can be hidden by tapping the 'Hide' and can be resumed by tapping the 'HAND' icon as shown in FIG.23.



FIG.23

2. Turn off the machine.

**⚠️CAUTION:** If the machine is in auto mode or the emergency stop button is pressed, do not push the machine forcefully to avoid the possibility of machine damage.

**Note:** When operating the machine manually, it is easier to cross the obstacle or the step by stepping on the pedal (31).

## Mobile App

This App can be installed on the mobile devices (ISO & Android). The user can view information and status of the machine, including battery level, current and scheduled tasks, historical reports, and more. Additionally, the app allows users to remotely schedule and send tasks, such as initiating a temporary cleaning task for the machine.

If there are any issues with downloading the app, please contact our company for technical support.

## Transportation

**⚠️CAUTION:** Be aware of the weight of the machine during the transportation.

The following steps should be taken when loading or unloading for transportation:

1. Turn off the machine.
2. Make sure the scrub head and squeegee are in the raised position before loading or unloading.
3. Drain and rinse recovery tank and solution tank.
4. Use a ramp to push the machine onto the pallet.
5. Place blocks between the front and rear wheels to prevent the machine from moving during transport.
6. Use packing straps to secure the machine, and place some soft materials like sponge between the machine and packing straps to avoid scratching the surface of the machine.
7. Do not lay the machine flat when loading or unloading.

**⚠️CAUTION:** Do not use forklift directly to pick up the machine, or use lifting rope to lift the machine. Do not use the handle of the machine as a fixed point.

**For safety:** Make sure the ramp can support the weight of the machine.

**For safety:** Do not operate the machine on the ramp with a gradient exceeding 8%.

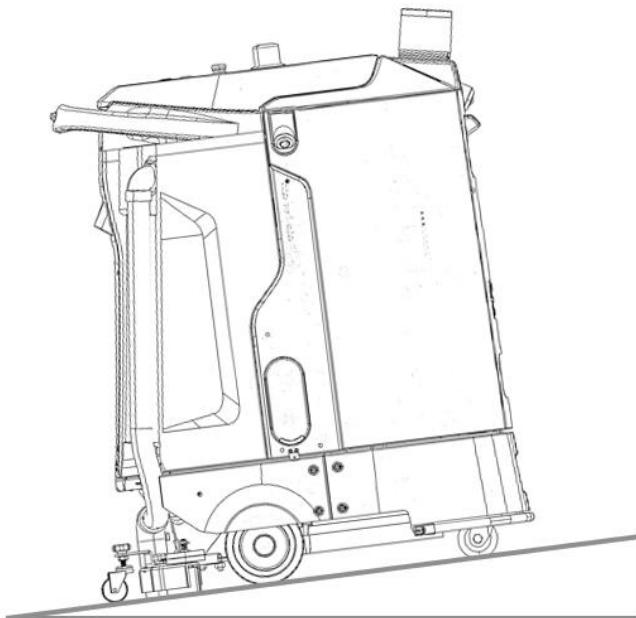


FIG.24

## Storage

**⚠ CAUTION:** Be aware of the weight of the machine during the storage.

The following steps should be taken when storing the machine.

1. Store the machine in the dry area indoors and out of direct sunlight under the following temperature conditions:

Min. storage temperature	-10°C/14°F
Max. storage temperature	40°C/104°F

2. Completely drain and rinse recovery tank and solution tank.
3. Make sure the scrub head and squeegee are in the raised position before storing.
4. Turn off the key switch before storing the machine.
5. Stop the machine on the level ground and block the wheels well.
6. Store the machine with a state of charge (SOC) of over 80% and check it bimonthly to ensure the battery SOC doesn't fall below 20%.

**Notice:** The battery will enter a dormant state automatically after 7 days of storage and the machine can't be turned on using the key switch. Please use the manual charger to activate the battery.

# Maintenance

The machine needs to be maintained regularly to keep the best of the performance and the service life.

**⚠️CAUTION:** When updating the software, make sure the battery level is more than 30% and do not shut down the machine as it may cause damage to the system.

**For safety:** Before maintaining or leaving the machine, stop on the level ground and turn off the machine.

**For safety:** Before maintaining the machine, read the user manual and understand fully.

**For safety:** When maintaining the machine, wear suitable gloves.

### Maintenance Schedule

Interval	Parts	Procedure	Person Resp.
Daily	Recovery tank	Drain, rinse, clean float shut-off screen.	Operator
	Debris filter bag	Clean	Operator
	Squeegee	Clean, check for damage and wear	Operator
	Skirt	Clean, check for damage and wear	Operator
	Disk brushes	Check for damage and wear	Operator
	Pads	Check, flip or replace	Operator
	Workstation recovery tank (If equipped)	Clean, rinse	Operator
	Covers	Clean the machine covers	Operator
Weekly	Battery*	Charge	Operator
	LiDAR	Clean	Operator
	Cameras	Clean	Operator
	Solution tank*	Rinse	Operator
	Recycling system filter elements*	Rinse	Operator
	Recovery tank filter	Clean	Operator
Monthly	Skirt	Check for damage and wear	Operator
	Solution tank filter	Clean	Operator
	Solution tank	Rinse	Operator
	Recovery tank lid seal	Check for wear	Operator
	Recycling system filter elements*	Replace	Operator
Three Months	Debris filter bag	Replace	Operator

Battery\*: if the machine is not equipped with workstation or charging station, the battery needs to be charged to 100% at least once a week.

Recycling system filter elements\*: The water recycling system is optional. If equipped with it, the solution tank and the filter elements are recommended to be maintained weekly.

The maintenance interval may vary depending on the type of the floor.

### Machine Maintenance

#### Recovery Tank Maintenance

The recovery tank is located beneath the top cover. For the sake of environmental protection, it is recommended to clean the recovery tank after each use to prevent the development of unpleasant odors.

**For safety:** Before maintaining or leaving the machine, stop on the level ground and turn off the machine.

1. Move the machine to a location where water can be drained.
2. Drain the recovery tank using the recovery tank drain hose.
3. Open the machine top cover.
4. Remove the recovery tank lid and hang it onto the machine top cover as shown in FIG.25.
5. Remove the debris filter bag (37), empty and clean it.
6. Rinse the tank, float sensor (39), the filter (40) and the float shut-off screen (41).
7. Clean the tank lid using a damp cloth.
8. Check the tank seal for damage or wear monthly, which is located on the bottom of the recovery tank lid.
9. Install the debris filter bag (37) back into the machine.
10. Put the tank lid onto the machine and close the machine top cover.

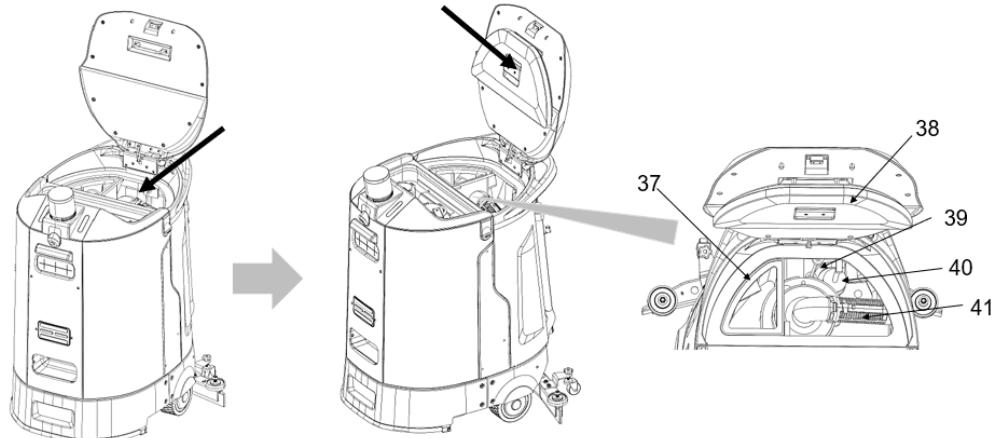


FIG.25

#### Solution Tank Maintenance

The solution tank is located beneath the machine top cover.

If the machine is equipped with the water recycling system, the solution tank is recommended to be cleaned weekly to remove dirty build-up caused by the solution.

The recycling system filters are located in the solution tank. The filter elements can be replaced when the maintenance time is reached or when the filtering effect is unsatisfactory.

**For safety:** Before maintaining or leaving the machine, stop on the level ground and turn off the machine.

**Notice:** Make sure the solution tank is drained out before removing filters.

**Note:** This water recycling system is optional.

For maintaining the solution tank, the following steps should be taken:

1. Move the machine to a location where water can be drained.
2. Drain out the solution tank using the solution tank drain hose (15).
3. Ensure that there are no debris in the solution tank; if any, clean it out. Rinse the filter (42), the float sensor (44), and the entire solution tank. It is recommended to remove the filter for cleaning using a brush. To remove the solution tank filters, rotate the filter bowl counterclockwise. If equipped with the water recycling system, the filter elements (45) should be replaced monthly.

For maintaining the water recycling system filters (45), the following steps should be taken:

1. Drain out the solution tank using the solution tank drain hose (15).
2. Remove the filters using the tool (43) which is located above the filter system as shown in FIG .26.
3. Replace the filter elements (45).
4. Reinstall the filter (45).

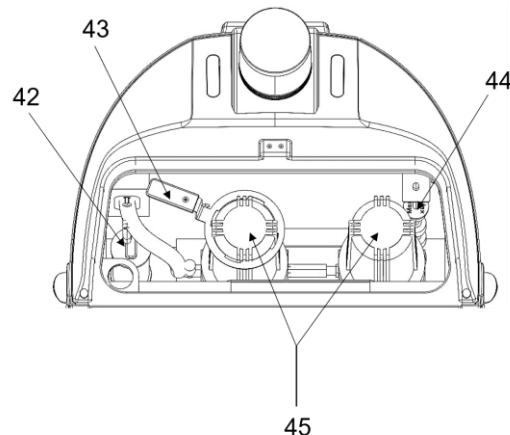


FIG.26

## Squeegee Maintenance

The squeegee is located at the bottom rear of the machine.

For keeping the best cleaning performance, please clean the blade daily. If squeegee leaves narrow streaks or water, the blades may be dirty or damaged. Remove the squeegee and

inspect the blades, rinse them using clean water if they are dirty. Replace or reverse the blades if they are damaged, worn or wavy.

**For safety:** Before maintaining or leaving the machine, stop on the level ground and turn off the machine.

1. Remove the squeegee from the machine.

To remove the squeegee, the steps should be followed as below:

- 1) Ensure that the squeegee is in the raised position.
- 2) Loosen the squeegee retainer knobs (26).
- 3) Hold the squeegee and pull it backwards.
2. Clean the squeegee for the daily maintenance
  - 1) Rinse the squeegee with clean water and dry it using a cloth.
  - 2) Reinstall the squeegee onto the machine.
3. Replace or reverse the blades if necessary. The operation is as shown in Fig.27.
  - 1) Push and hold the buckle (46) with thumb, then pull the blade from the squeegee.
  - 2) Slip the new or reversing blade into the squeegee, while pushing and holding the buckle.
  - 3) Reinstall the squeegee onto the machine.

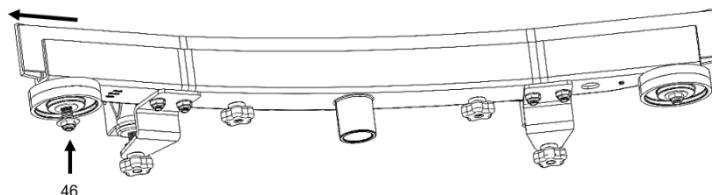


FIG.27

## Skirt Maintenance

There are two different type skirts, one is the side skirt and the other is front skirt.

**For safety:** Before maintaining or leaving the machine, stop on the level ground and turn off the machine.

There are two side skirts on the machine, located on the left and right sides of scrub head.

The skirt is located in front of the disk scrub heads. Please check the damage or wear monthly.

For maintaining the skirts, the following steps should be taken:

1. Make sure the brush head is in the raised position
2. Remove the disk brushes
3. Clean the skirt using a brush and rinse with fresh water.
4. Reinstall the disk brushes

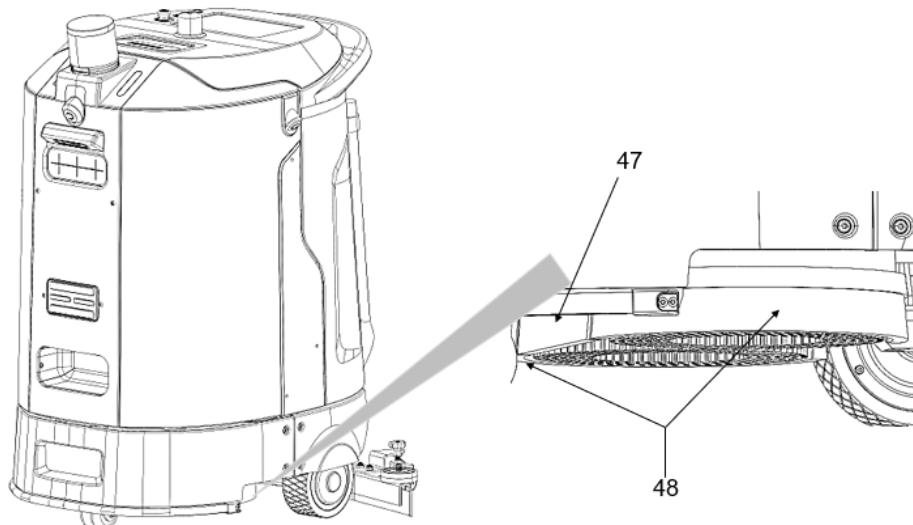


FIG.28

**Notice:** To clean the bristles properly, it is essential to brush in the direction of the bristles, as shown by the arrows in FIG.29.

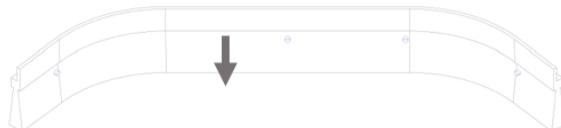


FIG.29

## Brush/Pad Maintenance

This machine is equipped with two brushes or two cleaning pads and they are located at the bottom of the machine. Please check the brushes daily for any tangled material, such as hair or wire, as well as for any damage or wear.

**For safety:** Before maintaining or leaving the machine, stop on the level ground and turn off the machine.

1. Ensure the scrub head is in the raised position.
2. Lift the side skirts.
3. Hold the brush/pad driver with hand and apply downward force to make it drop off as shown in FIG.30.

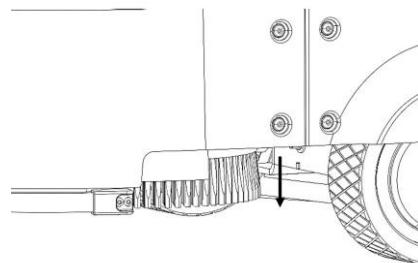
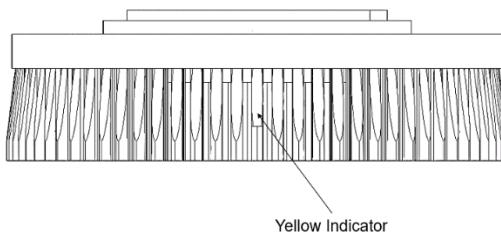


FIG.30

4. Clean any debris buildup from hub connection area.
5. Replace the pads when they no longer clean effectively. Replace the brushes when they no longer clean effectively or the bristles have worn down to the yellow indicator as shown in FIG.31.



**FIG.31**

**Note:** Replace brushes or pads in sets, or it can't clean the floor effectively.

6. Install the brushes or pads into the scrub head. The brush and scrub head are connected magnetically. If they cannot align during installation, gently rotate the brush until it enters the slot.
7. Lower the side skirts. Make sure they are securely in place before resuming the operation of the machine.

## Cleaning the Sensors

Use the dry microfibre cloth to clean the LiDAR and cameras regularly to avoid false detection.

Sensor items:

- 1) 3D LiDAR (5)
- 2) Front camera (6)
- 3) Front depth camera (7)
- 4) Rear depth camera (9)
- 5) Left camera (10)
- 6) Right camera (11)

## Software Updates

The software can be updated by the user in the 'Admin' account. The update access can be found in Admin > Device > Device Info.

**⚠ CAUTION:** When updating the software, ensure that the battery level is above 30%. Do not shut down the machine during the update process, as it may cause damage to the system.

**For safety:** Before maintaining or leaving the machine, stop on the level ground and turn off the machine.

**Note:** The machine cannot be operated or moved while updating the software.

### Battery

#### Charging Battery

**For safety:** Before charging or leaving the machine, stop on the level ground.

There are two ways to charge the battery:

1. Use the charging station/workstation to charge automatically, and the machine must be turned on.
2. Use the manual charger. When charging machine manually, the following steps should be taken:
  - 1) Before charging the battery, turn off the machine using the key switch.
  - 2) After completely shutting down, set the load-break switch to the "OFF" position.
  - 3) Connect output plug of the charger to the charging port of the machine.
  - 4) Connect the input plug of the charger to the AC power source as shown in FIG.33.
  - 5) If the charger's indicator shows a red or yellow flashing light, it means the battery is charging.
  - 6) When the battery is fully charged (the indicator shows a green light), unplug both the AC input and DC output plugs.

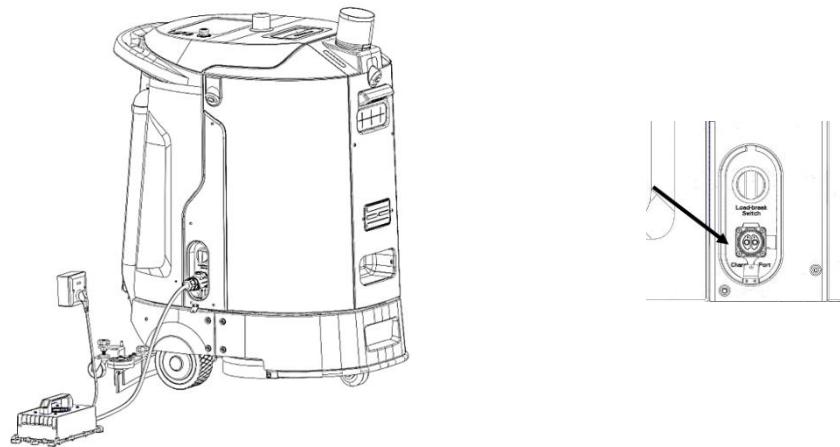


FIG.33

**Notice:** Steps 3 and 4 should not be switched, as it may cause electrical damage.

#### Battery Maintenance Precaution

**WARNING:** Do not disassemble or replace the battery without permission of the manufacturer.

**For safety:** Before charging or leaving the machine, stop on the level ground.

- Do not short circuit the battery, including the machine's charging port.
- Do not crush or drop the battery.
- Do not puncture the battery.
- Do not vibrate the battery.
- Do not expose the battery to flames or high-temperature environments exceeding 45°C.

- Do not expose the battery to water or any other liquids.
- Do not expose to sunlight, especially during charging.
- Do not install with other battery types or brands.
- Do not use other charger types or brands.
- Dispose of the battery safely according to local regulations.
- Charge and store battery under the following conditions:

Min. charge temperature	0°C/32°F
Max. charge temperature	45°C/113°F
Min. storage temperature	-10°C/14°F
Max. storage temperature	45°C/113°F

The best storage temperature is 15°C/59°F ~25°C/77°F .

## Workstation Maintenance

### Filling the detergent

The workstation has the feature of auto-filling detergent for the machine. the detergent should be filled into the detergent tank regularly.

To fill the detergent into the tank, the following steps should be taken:

- 1) Release the tank cap.
- 2) Fill the detergent.
- 3) Wipe off the detergent, if any remains on the surface of the station.
- 4) Cover the cap.

**Notice:** Please fill the low or no foam detergent to make the water pick-up more effective.

### Cleaning the water tank

The water tank is located behind the front cover(W12). Remove the cover and use the nozzle to clean it.

## Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Machine can't be turned on by the key switch	Load-break switch in the 'OFF' position	Turn the load-break switch to 'ON' position
	The battery enters a dormant state	Use the charger to activate the battery
	Battery is out of power	Charge the battery using a charger to activate it
	Battery failure.	Contact local dealer for technical support
	Key switch failure	Contact local dealer for technical support
	Control board failure	Contact local dealer for technical support

## Maintenance

Initialization failure	Choose a wrong map	Choose the right map
	Significant changes in the surrounding environment or being surrounded by the crowd during initialization	Move the machine and leave the crowd
	Machine is outside the map areas	Move the machine to the map areas
The machine doesn't execute the tasks	The battery is too low	Charge the battery
	Emergency stop button is pressed	Release the emergency stop button
	Machine is in the manual mode	Switch to the auto mode
Machine stopped moving	Machine error	Check the detail of the error on the screen or the mobile app and follow the steps according to the guide
	Battery is out of power	Charge the battery
	The emergency stop is pressed	Release the emergency stop
	Machine is switched to the manual mode	Switch to the auto mode
The machine can't be charged	The switch of docking station is turned to the 'OFF' position	Turn the switch to the 'ON' position
	The air circuit breaker of the docking is turned to 'OFF' position	Turn the air circuit breaker to the 'ON' position
	The docking station has been moved	Move the charging station to the original position
	The docking station or charger didn't get connected to the AC power	Connect the cord to the outlet
	Charger is damaged	Contact local dealer to replace the charger
	Battery failure	Contact local dealer for technical support
The waste water can't be automatic drained	The recovery tank filter is clogged	Drain the waste water using the drain hose and clean the filter
	Draining pump failure	Contact local dealer for technical support
Poor water pick-up	Squeegee blade is damaged or worn	Replace or reverse the blade
	Recovery tank drain hose leak	Secure hose cap or replace
	Vacuum hose clogged	Clean the hose
	Debris caught in squeegee	Clean the squeegee
	Damaged the vacuum hose	Replace the vacuum hose
	Defective seals on recovery tank lid	Replace the seal
	The recovery tank is full due to the failure of the sensor	Contact local dealer for technical support
	Excessive foam buildup	Use the low or no foam detergent or add defoamer to the recovery tanks
Poor scrubbing performance	The brushes or pads were worn or damaged	Replace the brushes or pads
	Machine is moving too fast	Slow down the machine
	Using wrong brush or pad	Use the right brush or pad
	Not enough solution	Increase the solution flow; Clean the solution tank filter

## Specifications

### 1. ANB450 Specifications

<b>DIMENSIONS</b>	
Length	810 mm   31.9 in
Width	615 mm   24.2 in
Height (main body)	1075 mm   42.3 in
Weight	150 kg   331 lbs
GVW	188 kg   414 lbs
Cleaning Width	450 mm   17.7 in
Squeegee Width	740 mm   29.1 in
<b>CLEANING</b>	
Max. Theoretical Productivity	1944 m <sup>2</sup> /hr   20925 ft <sup>2</sup> /hr
Brush Pressure	20 kg   44.1 lbs
Disk Brush Speed	270 RPM
Solution Tank Capacity	38 L   10 gal
Recovery Tank Capacity	36 L   9.5 gal
<b>MOVEMENT</b>	
Max. Speed	1.2 m/s   2.68 mph
Min. Distance from Wall	0~30 mm   2 in
Min. Passable Width	810 mm   31.9 in
Gradeability	8% (The machine is not recommended for running on slopes in automatic mode, and it can be operated manually on slopes ≤8%.)
<b>POWER</b>	
Battery Type	Lithium Iron Phosphate
Battery Capacity	70 Ah
Rated Voltage	24 VDC
Charging Time	2.7 hours
Max. Runtime	4.5 hours
<b>SENSING</b>	
32-beam 3D LiDAR, 3D Depth Camera, Bumper Sensor, IMU Sensor	
<b>SOUND LEVEL (EN 60335-2-72:2012)</b>	
Sound Pressure Level	≥66 dB (A) L <sub>pA</sub> , 3dB(A) K <sub>pA</sub>
Sound Power Level	≥78 dB(A) L <sub>WA</sub>
<b>VIBRATION AT THE HANDLE</b>	
OPERATING ALTITUDE	< 2.5 m/s <sup>2</sup>

### 2. Charging station

Dimensions (main body L*W*H)	420*225*620 mm 16.5*8.9*24.4 in
Weight	27 kg   60 lbs
Input voltage	100-240 V a.c
Max. power	1000 W   1.34 hp
Output voltage	24 VDC
Output current	30 A

## Specifications

### 3. Workstation

Dimensions (main body L*W*H)	460*270*860 mm 18.1*10.6*33.9 in
Weight	45 kg   99 lbs
Input voltage	100-240 V a.c
Max. power	1000 W   1.34 hp
Output voltage	24 VDC
Output current	30 A

### Machine Dimensions

