



Clean like a pro

Autonomous Vacuum Sweeper SP50



User Manual

Original Instruction



Rev: 07/2024



www.cenobots.com

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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 CenoBots.

Intended Use

SP 50 is an automatic drive, LFP battery powered, wide area used, AI-power vacuum sweeper. This machine is intended for commercial use, for example in hotels, schools, hospitals, shopping mall, offices and rental businesses. It's designed to dry clean the hard and soft floor (such as tile, wood floor, terrazzo, carpet, 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 can be found on the nameplate, which is located on the back of the machine's top lid. 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: _____



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 CenoBots directly for missing items.

Notice: Please fully charge the machine before first use.

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.
- 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 charger incorporates an earth connection for functional purposes and must only be plugged into an earthed socket-outlet.
- If the supply cord is damaged, it must be replaced with the cord provided by CenoBots by the manufacturer, its service agent, or similarly qualified persons in order to avoid a hazard.

⚠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 CenoBots. 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: 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 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 use 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 CenoBots. The use of other accessories may impair safety.
2. Before start up the machine:
 - If safety-relevant covers such as roller brush cover, power supply cords are damaged, stop the machine and report.
 - Ensure that all covers and doors are positioned as specified in the instructions.
 - 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 the 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.
 - Do not transport other persons and objects with this machine.
 - Keep children and unauthorized persons away from machine.
 - Do not operate manually the machine on the ramp with a gradient exceeding 8%.
 - The appliance is only to be used with the <CCS-02> supply unit for the auto charging.
4. When using the machine in automatic mode
- Use it as described in the manual.
 - Do not stop on slopes.
 - Do not use in places with various moving vehicles, such as parking lots.
 - Pay attention to the local situation, it is important to reduce speed.
 - Reduce speed on the inclines and slippery ground.
 - Go slowly on slopes and slippery surfaces.
 - 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%.
 - The appliance is only to be used with the <CCS-02> supply unit for the auto charging.
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 left unattended shall be secured against unintentional movement.
6. When maintaining the machine
- Turn off the machine and remove the key.
 - Stop on the level ground.
 - Do not jack up machine.
 - Do not work under a machine without safety blocks or stands to support the machine.
 - Use accessories and consumables supplied or authorized by CenoBots. 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 CenoBots robots. Do not use the charger to charge other devices.
7. When transporting the machine:
- Turn off the machine and remove the key.
 - 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

	Caution: watch your hand to avoid damage.
	Do not step on the place, may cause damage to the machine.
	This is the Class 1 laser device and it's safe for the eyes.
	Disposal
	Do not throw used machine components to the bin.

Know your Machine

Overview of Appearance

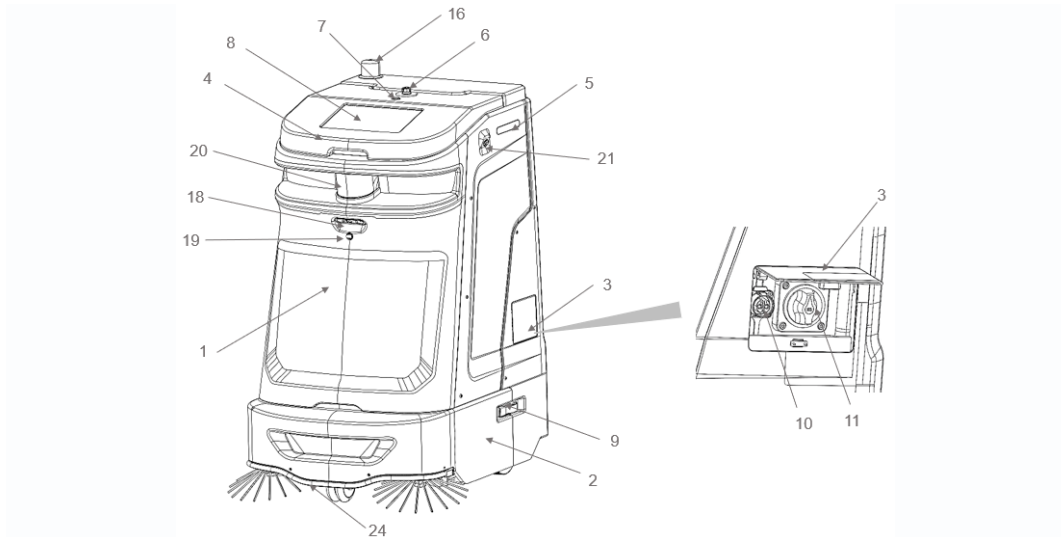


FIG.1

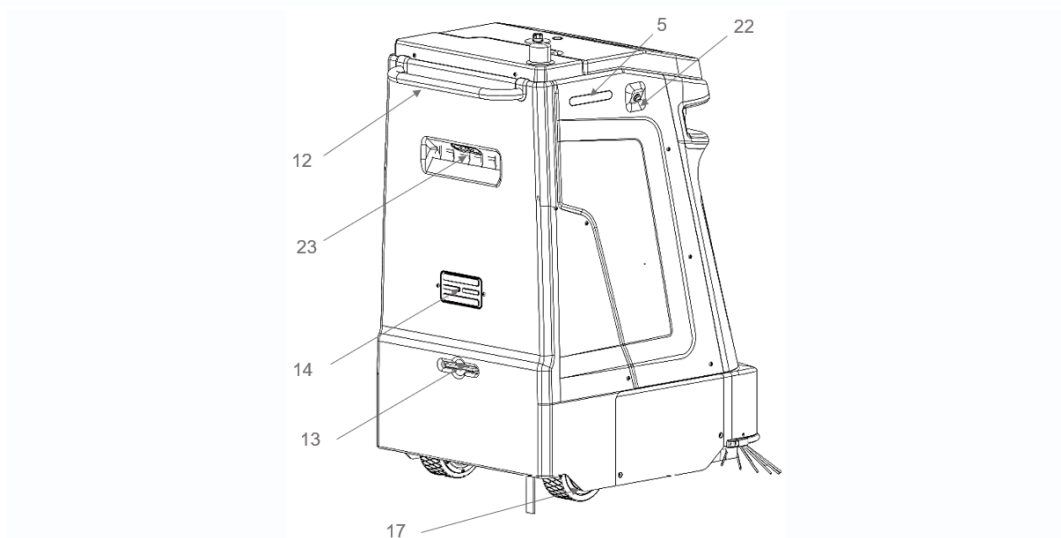


FIG.2

● Covering parts

- 1. Front cover
- 2. Left door
- 3. Manual charging port door
- 4. Top lid

● HMI & Operating parts

- 5. Indicator
- 6. Emergency stop button
- 7. Auto/Manual switch
- 8. Touch screen
- 9. Left door latch
- 10. Manual charging port
- 11. Load-break switch
- 12. Handle
- 13. Pedal
- 14. Auto charging port
- 15. Key switch (refer to the section **Control Panel**)
- 16. Warning light

17. Drive wheel

- **Sensors**

18. Front depth camera

19. Front camera

20. 3D LiDAR

21. Left camera

22. Right camera

23. Rear depth camera

24. Bumper sensor

Indicator light introduction

Indicator (5): Indicators are in the right and left of the machine. They show the working status.

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

Sensor introduction

- Front depth camera (18): Used for obstacle avoidance and localization.
- Front camera (19): Detect garbage.
- 3D LiDAR (20): CLASS 1 laser. Used for mapping, localization and obstacle avoidance.
- Left camera (21): Used for obstacle avoidance.
- Right camera (22): Used for obstacle avoidance.
- Rear depth camera (23): Used for obstacle avoidance, cleaning result checkup, and positioning when docking.
- Bumper sensor (24): Used for collision detection.

Cleaning System

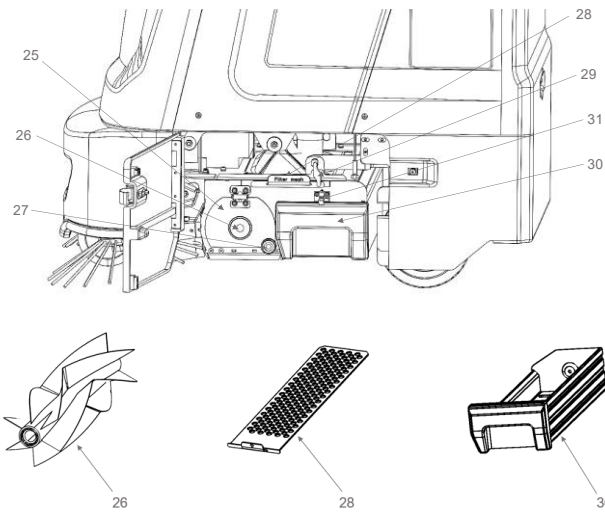


FIG.3

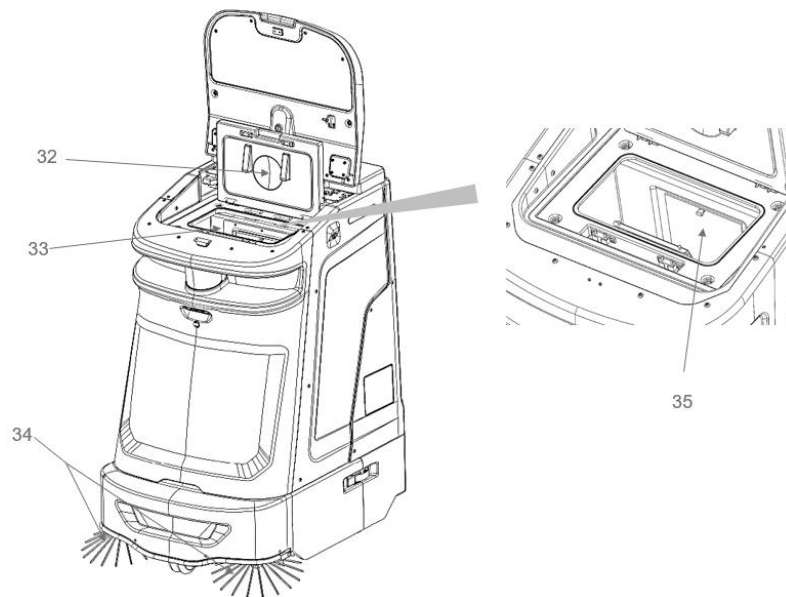


FIG.4

- | | |
|-----------------------------|---------------------|
| 25. Brush deck cover | 31. Trash tray clip |
| 26. Roller brush | 32. Dustbin lid |
| 27. Brush deck door knob | 33. Dust filter bag |
| 28. Filter mesh | 34. Side brush |
| 29. Filter mesh spring clip | 35. HEPA |
| 30. Trash tray | |

Control Panel

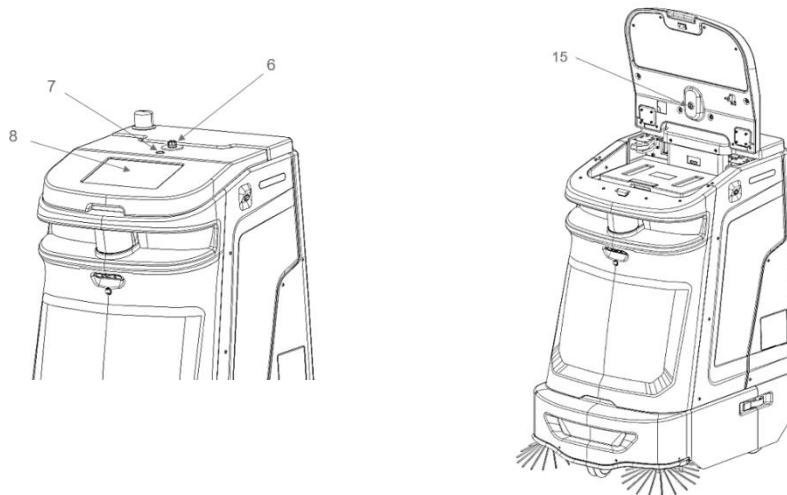


FIG.5

1. EMERGENCY STOP BUTTON (6)

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 motors to cease operation.

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.

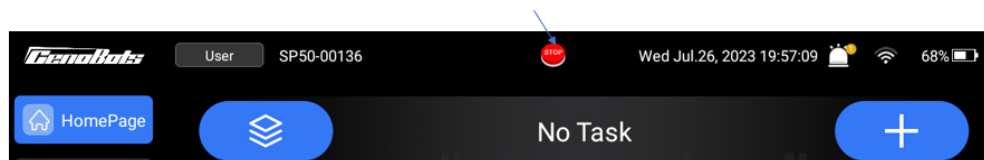


FIG.6

⚠ 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.

2. AUTO/MANUAL SWITCH BUTTON (7)

This machine has two operating modes:

- **Autonomous Mode:** The autonomous mode is used to automatically clean 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 operator this machine to clean 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.

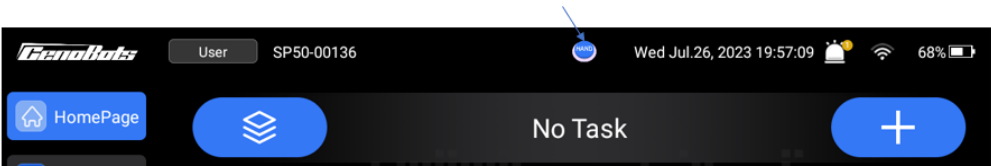


FIG.7

3. TOUCH SCREEN (8)

The User Interface (UI) is an essential component of the machine, consisting of a 10.1-inch touchscreen display located at the top of the machine. 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 or CenoBots 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.8

- | | |
|-------------------------|---|
| A. Account | C. The E-stop status and operation mode |
| B. Machine model and ID | D. Date |

Know your Machine

- | | |
|--|--|
| E. Time | L. Create a temporary task |
| F. Warning notice | M. Account logout |
| G. Network | N. Task pauses or continues |
| H. Battery level | O. End task |
| I. Map selection | P. Return to the docking station |
| J. Task completion rate and task details | Q. Select cleaning intensity (Can be selected after the task starts) |
| K. Cleaning mode and status | |

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.

Favorites

On this page, temporary tasks can be pre-set, making it more convenient for the end user to submit tasks.

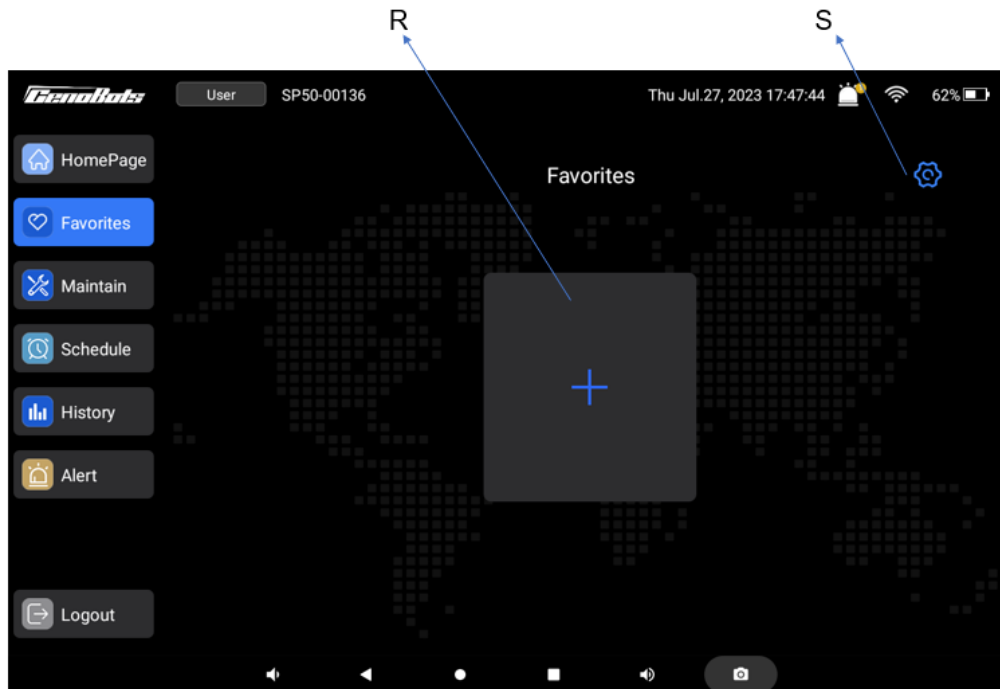


FIG.9

R. Select/create the tasks

S. Detail settings

Maintain Page

The 'Maintain' page displays the maintenance details of the machine. After completing the maintenance, click '**Reset**' to reset the countdown.

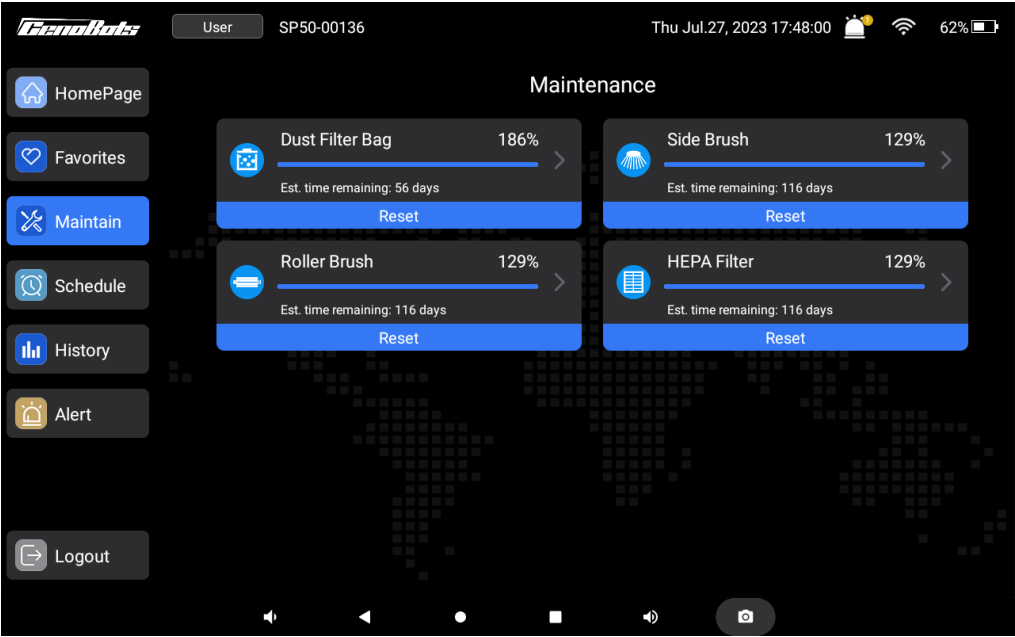


FIG.10

Schedule Page

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

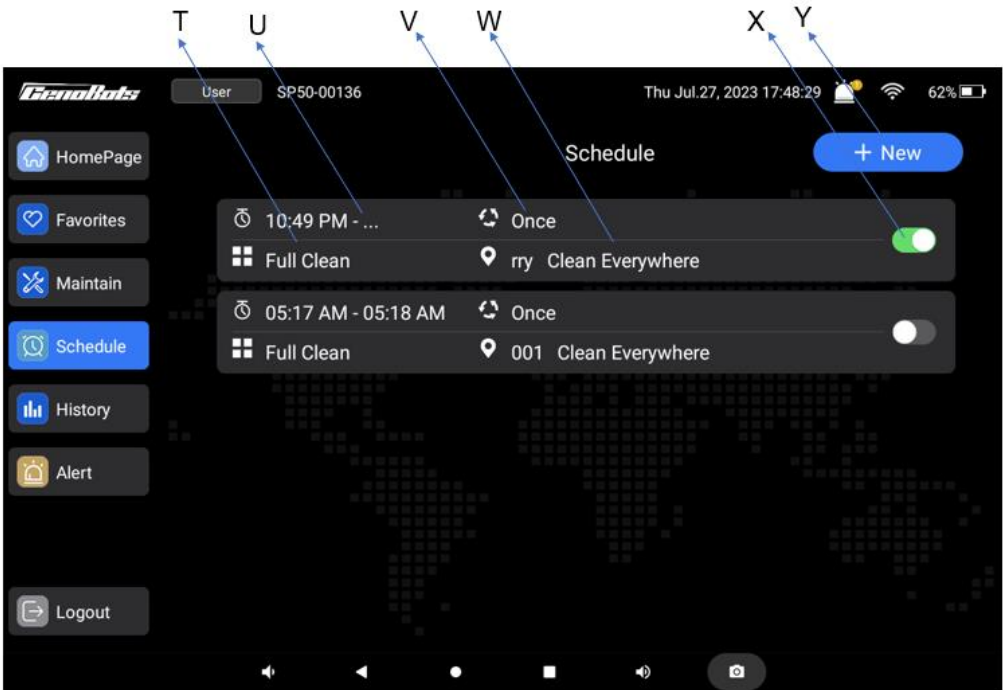


FIG.11

- | | | | |
|----|--------------------------------|----|----------------------------|
| T. | Cleaning mode of the task | W. | The location of the map |
| U. | Start and end time of the task | X. | Task execution button |
| V. | Number of cleaning repetitions | Y. | Create new scheduled tasks |

Clean Mode: There are two selectable modes.

- Full Clean: Machine will do the full coverage cleaning in the selected areas. The cleaning intensity can be selected in this mode.
- Patrol Clean: In this mode, the machine patrols the area and cleans up the detected garbage.

History Page

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

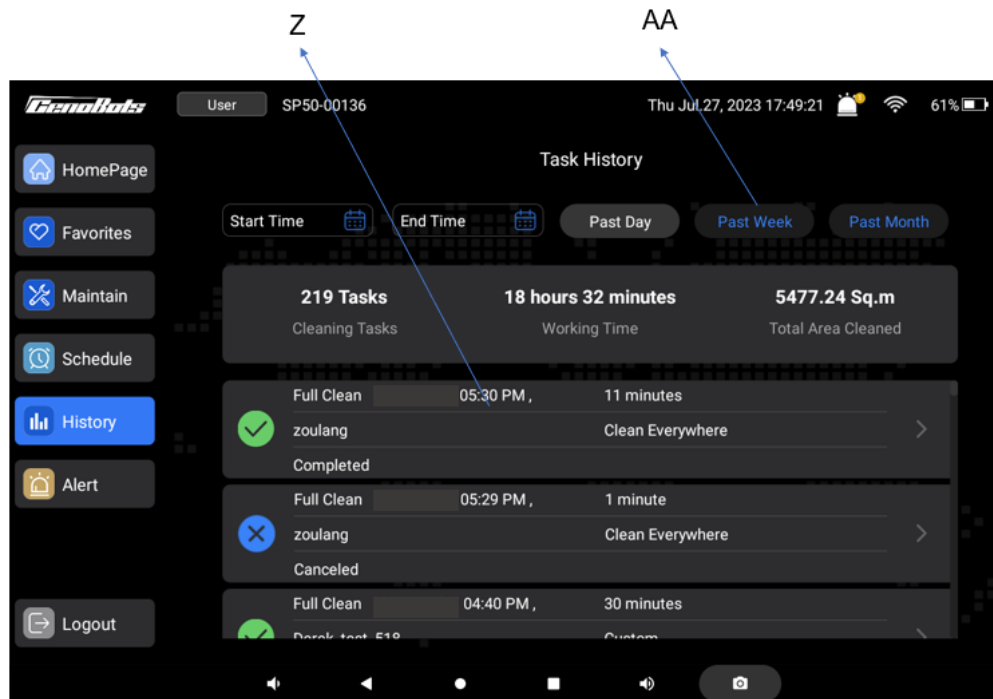


FIG.12

Z. Cleaning mode of the task

AA. Task time selection

Alert Pag

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

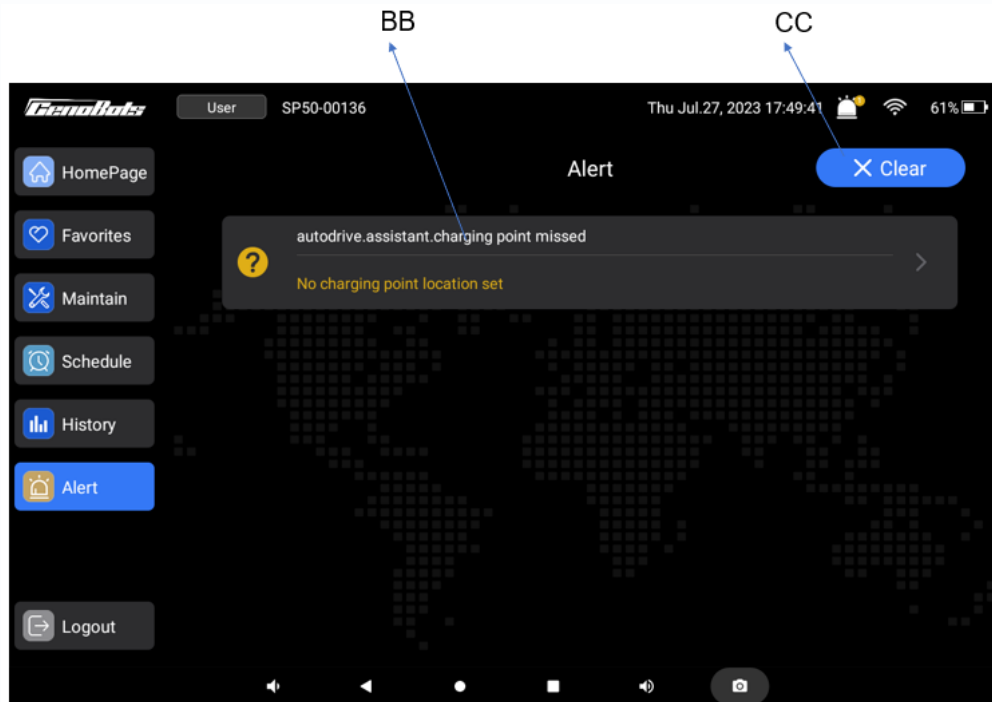


FIG.13

BB. Area of displaying the alert code

CC. Clear errors

4. HANDLE (12)

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.

5. KEY SWITCH (15)

The key switch that controls the power of the machine is located on the back of top lid. 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 a few seconds.

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

6. PEDAL (13)

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

7. LOAD-BREAK SWITCH (11)

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

Charging Station

The charging station features automatic charging for the machine. When the battery level is low, the machine will return to the station to recharge. With the inclusion of a charging station, the need for human intervention has greatly reduced, resulting in increased machine efficiency.

The charging stations is optional.

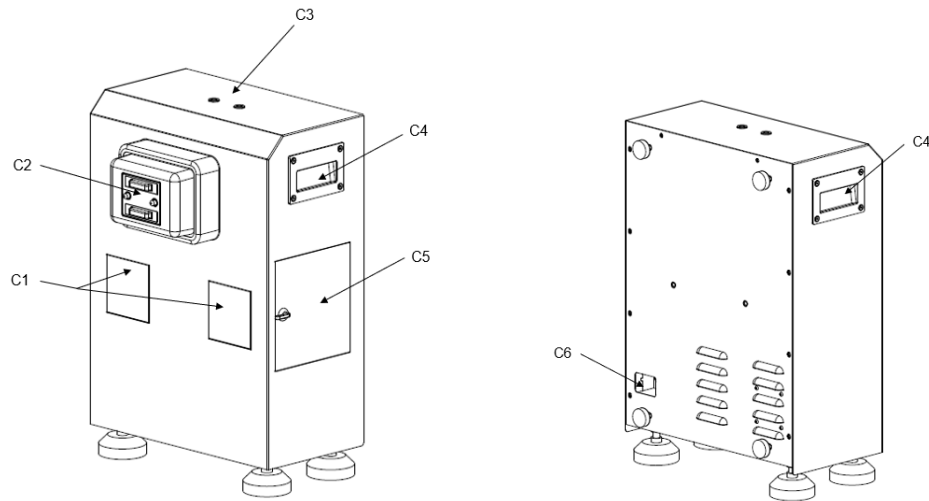


FIG.14

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

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

There is an output power cord located behind the left door (C5) for manual charging. This function can be used when the battery is in dormant mode or needs manual charging.

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 or CenoBots 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.

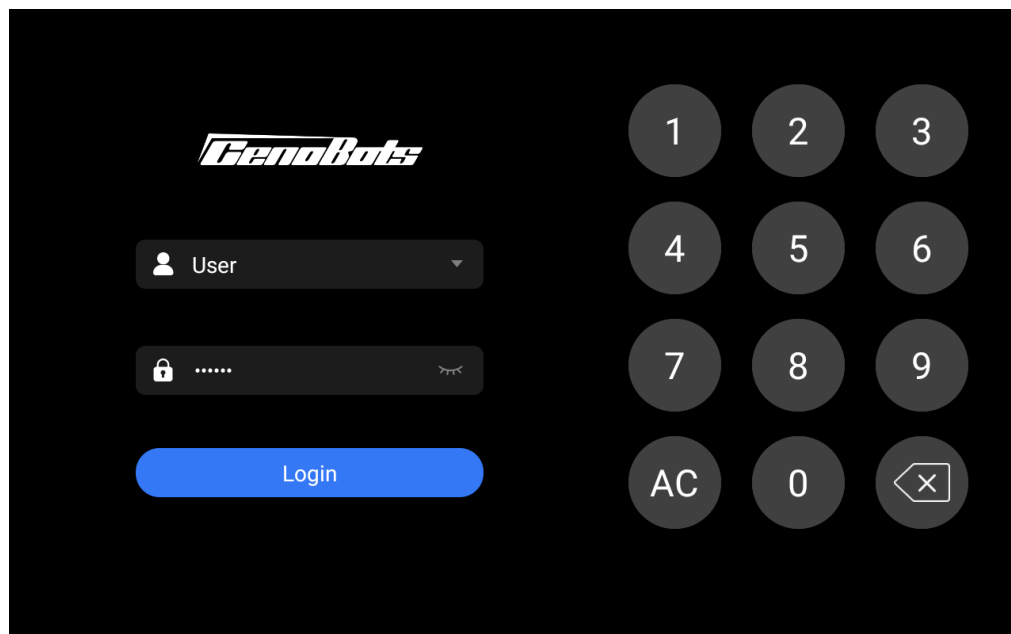


FIG.15

Selecting the Map

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

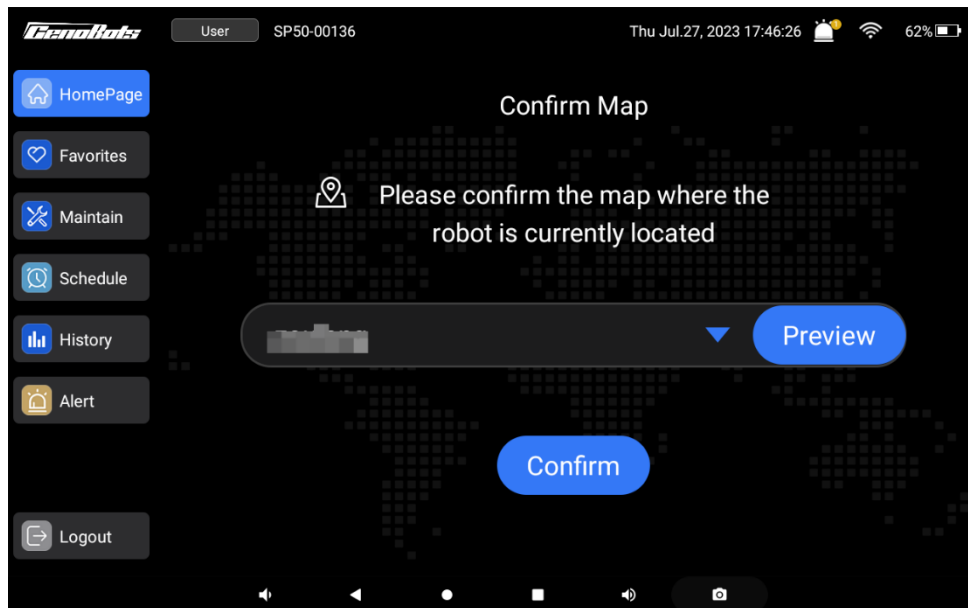


FIG.16

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, and select the map.
4. Save the settings.
5. Select the tasks tapping 'Task execution button'(X)

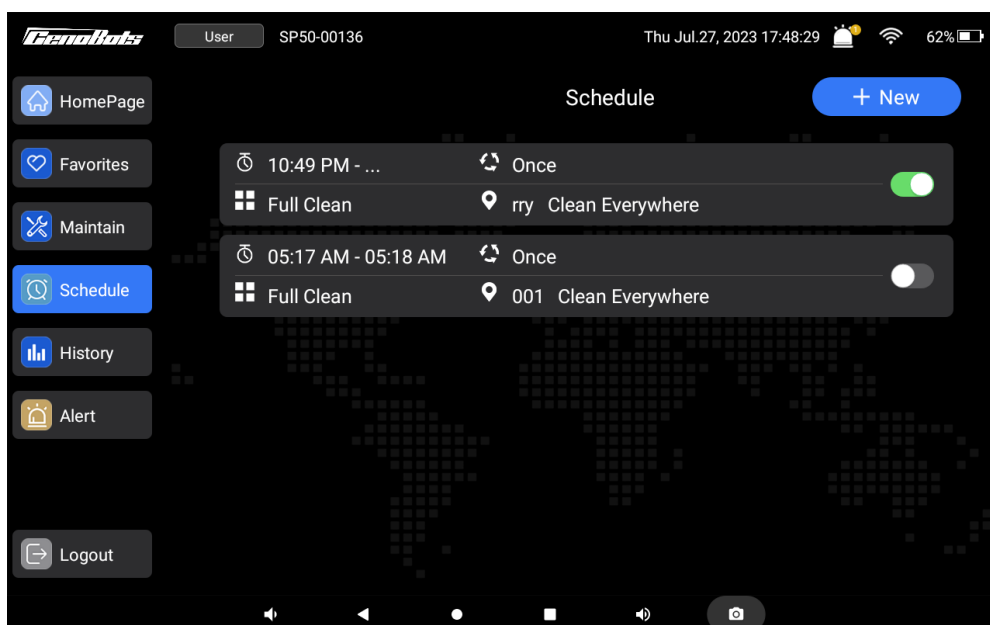


FIG.17

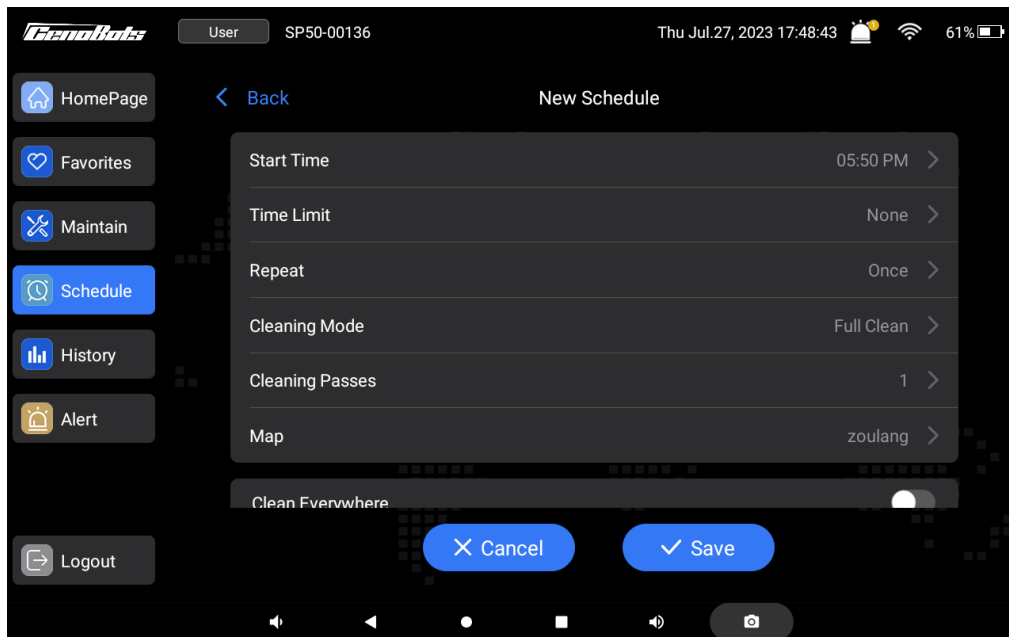


FIG.18

- **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.
- **Cleaning Mode:** There are multiple options available for selecting different modes and levels of cleaning intensity. For information on the different cleaning modes, please refer to the 'Control Panel' section.
- **Cleaning Passes:** The machine will repeatedly clean the selected area according to the number of times.
- **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, cleaning passes, map and cleaning areas.
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'**, **'Map'** 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'**.

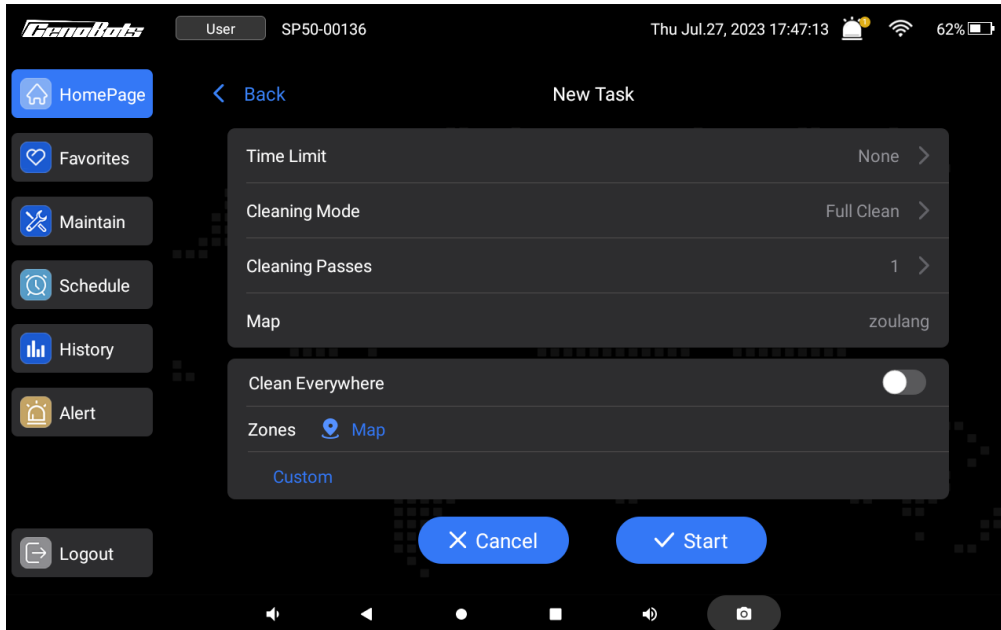


FIG.19

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 or CenoBots directly.

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

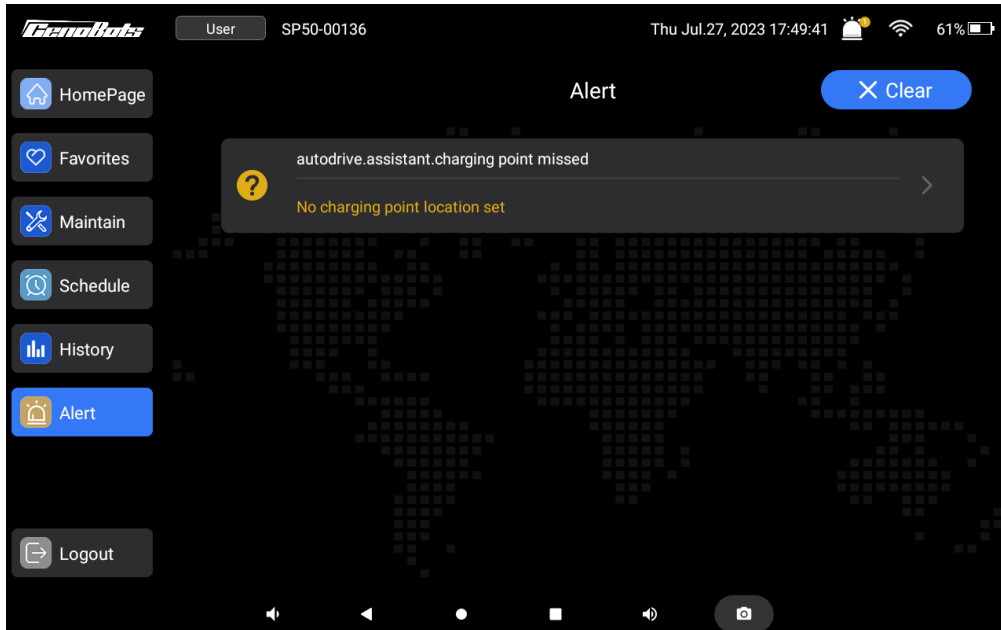


FIG.20

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, brush motors and vacuum motor to cease operation.

2. Pause the task

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

4. Go home

Tap the 'Go home' icon, and the machine will end the task and return to the docking station.

For Safety: Do not stop the machine on slopes.

Turning off Machine

Turn off the machine using the key switch. After turning the key switch off, the brushes 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%.

⚠ 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.

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. When in manual mode, an operating page, depicted as FIG.21, is displayed on the screen.

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

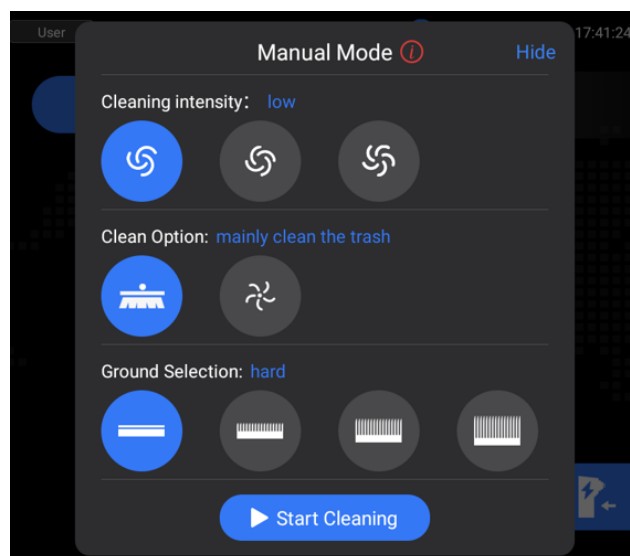


FIG.21

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

Cleaning intensity: The cleaning intensity offers three levels: low, medium, and high. Operators can select the desired level according to the level of dirtiness on the floor.

Clean Option:

- Mainly clean the trash: In this option, the machine will perform well in cleaning the trash.

- Mainly clean the dust: In this option, the machine will perform well in cleaning the dust.

Ground Selection: Select the floor type according to the current floor. Selecting the appropriate floor type improves cleaning performance.

Hide:

This page can be hidden by tapping the 'Hide' and can be resumed by tapping the 'HAND' icon as shown in FIG.22.

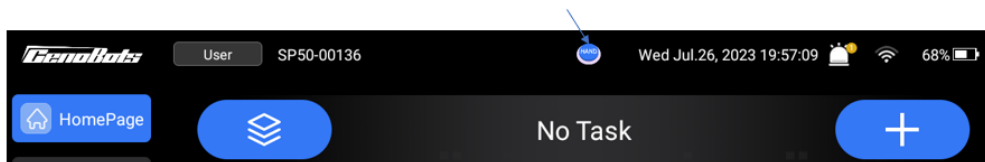


FIG.22

2. Turn off the machine.

Note: When operating the machine manually, it is easier to cross the obstacle or the step by stepping on the pedal. The pedal should be pushed into the original position after use.

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.

Please search 'CenoBots' in the App store. If there are any issues with downloading the app, please contact Cenobots 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 roller brush and side brush are in the raised position before loading or unloading.
3. Use a ramp to push the machine onto the pallet.
4. Place blocks between the front and rear wheels to prevent the machine from moving during transport.
5. Use packing straps to secure the machine, and place some soft materials like sponge between the machine and packing straps to avoid rubbing off the paint.
6. 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%.

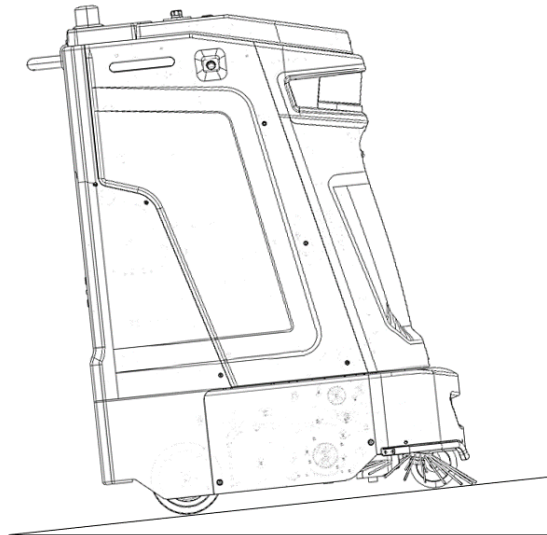


FIG.23

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
Max. storage temperature	45°C

2. Clean the trash tray.
3. Ensure the roller bush and side brush 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 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	Side brush	Check, clean	Operator
	Roller brush	Check, clean	Operator
	Baffle	Check, clean	Operator
	Filter mesh	Check, clean	Operator
	Dust filter bag	Check	Operator
	HEPA	Check, clean	Operator
	Trash tray	Clean	Operator
	Machine cover*	Clean	Operator
Weekly	Roller brush	Clean	Operator
	Side brush	Clean	Operator
	Battery*	Charge	Operator
	LiDAR	Clean	Operator
	Camera	Clean	Operator
	Dust filter bag	Replace	Operator
Three months	Roller brush	Replace	Operator
	Side brush	Replace	Operator
Six months	HEPA	Replace	Operator
Yearly	Synchronous belt	Check, replace	Trained Personnel
	Castor	Check, replace	Trained Personnel

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

Machine cover*: Use a dry or damp cloth to clean the machine cover. Do not use corrosive cleaner or organic solvent when cleaning the cover.

Machine Maintenance

Filter Mesh Maintenance

The filter mesh is located above of the trash tray.

1. Remove the filter mesh from the machine.

To remove the filter mesh, the steps should be followed as below:

- 1) Open the left door (2) of the machine by releasing the latch.
 - 2) Release the filter mesh spring clip by pulling and rotating it gently.
 - 3) Slide the trash tray away from the machine.
2. Use a damp cloth or paper towel to clean it thoroughly. Make sure to remove any remaining debris or floc from the filter and wipe it dry.
 3. Reinstall it back into the machine. Make sure it is securely in place before resuming the operation of the machine.
 4. Pull and rotate the clip to its original position to lock the filter mesh.

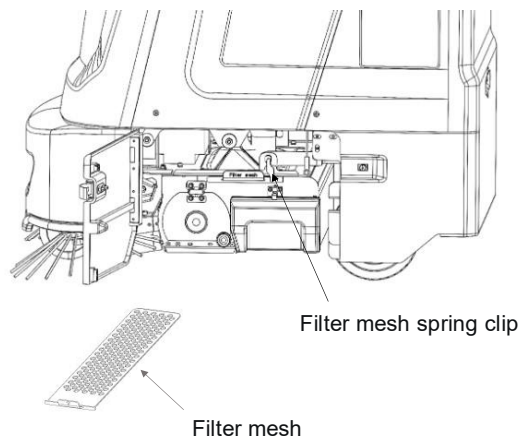


FIG.24

Trash Tray Maintenance

The trash tray is located on the middle bottom of the machine.

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

1. Remove the trash tray from the machine.

To remove the trash tray, the steps should be followed as below:

- 1) Open the left door (2) of the machine by releasing the latch.
 - 2) Release the trash tray clip.
 - 3) Slide the trash tray away from the machine.
2. Empty the contents of the trash tray. Be careful not to spill any debris or dust that has accumulated in the tray.

3. After emptying the trash tray, use a damp cloth or paper towel to clean it thoroughly. Make sure to remove any remaining debris or dust from the tray and wipe it dry.
4. Reinstall it into the machine. Make sure it is securely in place before resuming the operation of the machine.

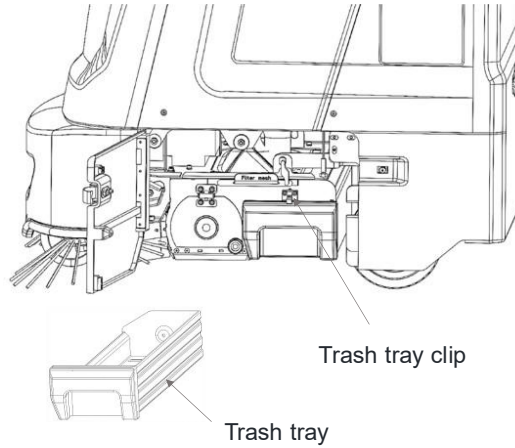


FIG.25

Brush Maintenance

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

Roller brush

The roller brush is located on the middle bottom of the machine with the brush deck.

1. Move the roller brush from the brush deck.
To remove the roller brush, the steps should be followed as below:
 - 1) Open the left door (2) of the machine by releasing the latch.
 - 2) Ensure the roller brush is in the raised position.
 - 3) Loosen the knob and open the brush deck door.
 - 4) Remove the roller brush.
2. Use a pair of scissors or a utility knife to cut away any tangled or wrapped debris from the brush bristles. Be careful not to damage the bristles or the brush itself.
3. Check the roller brush for any signs of wear or damage, such as frayed bristles or cracks in the brush. If the brush is damaged, replace it with a new one.
4. Check the roller brush deck for any debris and remove it.
5. Reattach the roller brush to the machine, making sure it snaps securely into place and the brush deck door can completely close when the roller brush is installed.

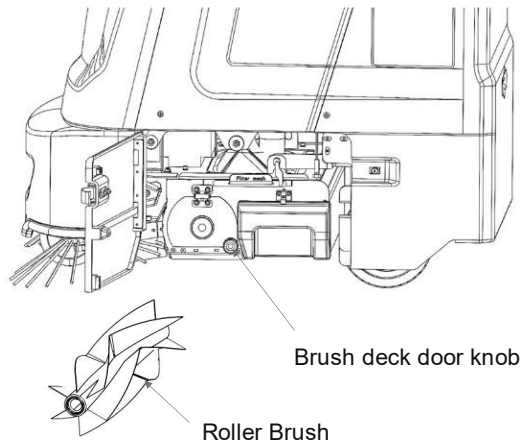


FIG.26

Side brush

Side brushes are the two brushes on the front of the machine.

1. Remove the side brush from the machine.

To remove the side brush, the steps should be followed as below:

- 1) Ensure the side brush is in the raised position.
 - 2) Loosen the side brush retainer knob at the bottom of the side brush.
 - 3) Gently pull the side brush down and remove it from the side brush motor on the machine.
2. Use a pair of scissors or a utility knife to cut away any tangled or wrapped debris from the brush bristles. Be careful not to damage the bristles or the brush itself.
 3. Use a damp cloth or paper towel to wipe the brush clean.
 4. Check the side brush for any signs of wear or damage, such as frayed bristles or cracks in the brush. If the brush is damaged, replace it with a new one.
 5. Then reattach the side brush to the machine, making sure it snaps securely into place, then screw the side brush retainer knob on the side brush motor.

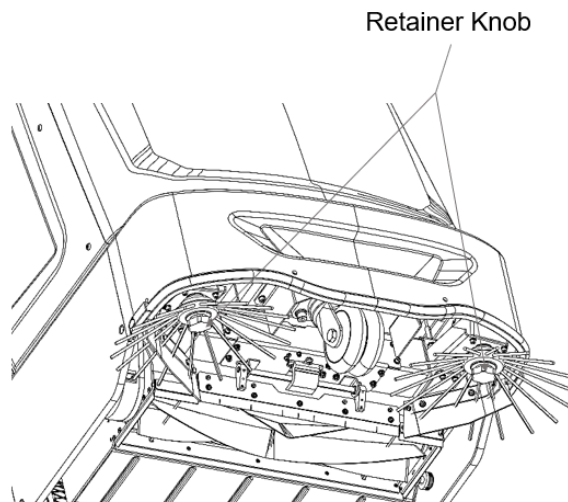


FIG.27

Dust Filter Bag Maintenance

HEPA filter and dust bag are located at the top of the machine.

1. Open the top lid of the machine.
2. Open the dustbin lid, dust bag filter is located in the dustbin.
3. Remove the dustbag by pulling it gently. Inspect the dustbag for any signs of damage or wear, such as holes, tears, or rips. If the dustbag is damaged, replace it with a new one.

HEPA Maintenance

HEPA (High-Efficiency Particulate Air) filters are located behind the dust bag that helps to trap fine dust, pollen, and other allergens.

1. Remove the HEPA filter from the dustbin.
2. Inspect the HEPA filter for any signs of damage, such as tears, holes, or clogs. If the filter is damaged or clogged, replace it with a new one.

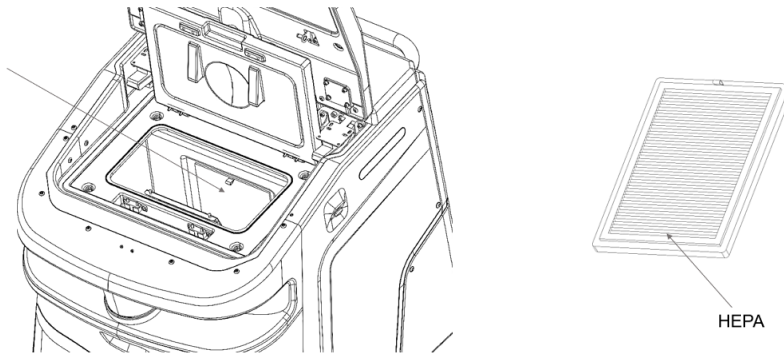


FIG.28

Clean the Sensors

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

List of sensor items:

- 1) Front depth camera (18)
- 2) Front camera (19)
- 3) 3D LiDAR (20)
- 4) Left camera (21)
- 5) Right camera (22)
- 6) Rear depth camera (23)

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 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) Connect output plug of the charger to the charging port of the machine.
 - 3) Connect the input plug of the charger to the AC power source as shown in FIG.29.
 - 4) If the charger's indicator shows a red or yellow flashing light, it means the battery is charging.
 - 5) When the battery is fully charged (the indicator shows a green light), unplug both the AC input and DC output plugs.

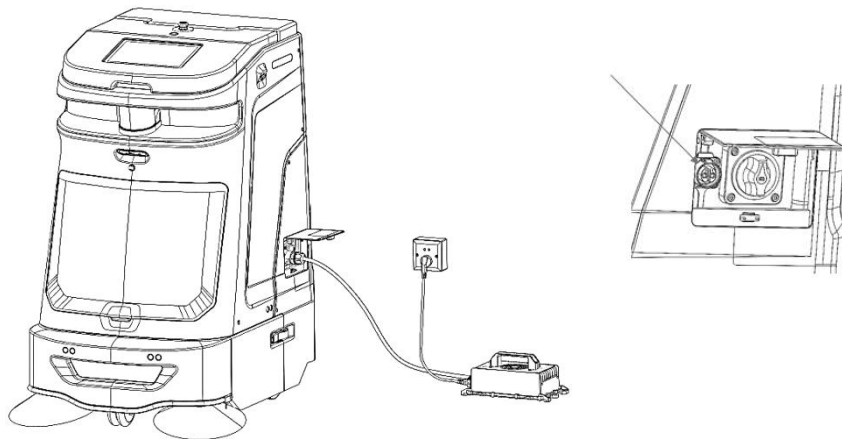


FIG.29

Notice: Steps 2 and 3 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 /113°F.
- 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.
- This battery is for use with CenoBots robots only.
- 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.

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 mode	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 or CenoBots for technical support.
	Key switch failure	Contact local dealer or CenoBots for technical support
	Control board failure	Contact local dealer or CenoBots for technical support
Initialization failure	Choose a wrong map	Choose the right map
	Significant changes in the surrounding environment or surrounded by the crowd during initialization	Move the machine and leave the crowd

Maintenance

	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 stopped moving	Battery is out of power	Charge the battery
	The emergency stop is pressed	Release the emergency stop
Machine is making unusual noises while running	Foreign objects stuck in the roller brush or side brush	Check and clean the roller brush and side brush
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 or CenoBots for technical support
Poor vacuum performance	The dustbin lid is not tightly closed	Close the lid of dustbin tightly
	Dust filter bag is full	Replaced the dust filter bag
	Dust filter bag is broken and HEPA is full of dust	Replace the dust filter bag and clean the HEPA
	Deck filter mesh is full of floc	Clean the filter mesh.
	Vacuum motor is in the low mode	Turn the clean mode to high intensity
Fail to clean the trash	The roller brush synchronous belt damaged	Contact local dealer for technical support
	Baffle damaged.	Contact local dealer for technical support
	Trash tray is full; Trash tray isn't installed	Clean or install the trash tray

Specifications

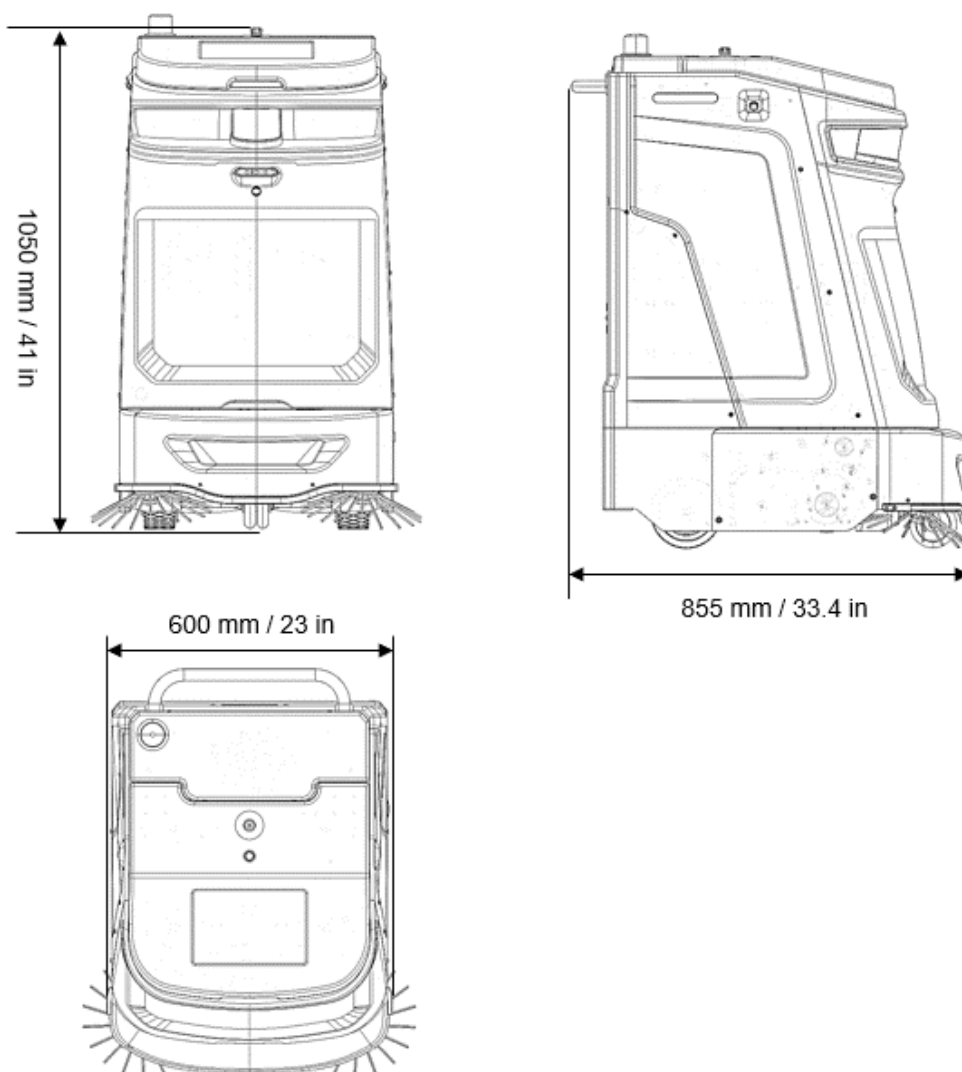
1. SP50 specifications

DIMENSION	
Length	855 mm 33.4 in
Width	600 mm 23 in
Height	1050 mm 41 in
GVW	132 KG 291 lbs
Sweeping Width (w/ side brushes)	720 mm 28 in
Roller Brush Length	460 mm 18 in
CLEANING	
Max. Theoretical Productivity (spot cleaning)	15550 m ² /hr 167379 ft ² /hr
Max. Theoretical Productivity (regular cleaning)	1987 m ² /hr 21387.9 ft ² /hr
Roller Brush Rotation Speed	1000 RPM
Trash Tray Capacity	5 L 1.3 gal
Dust Filter Bag Capacity	18 L 4.8 gal
Max. Suction of Vacuum Motor	25 kPa
MOVEMENT	
Max. Speed	1.2 m/s 2.68 mph
Min. Distance from Wall	<5 mm 2 in
Min. Passable Width	800 mm 31 in
Min. Turn-around Width	1200 mm 47 in
Gradeability	8% (The machine is not recommended for running on slopes in automatic mode, and it can be operated manually on slopes ≤8%.)
POWER	
Battery Type	Lithium Iron Phosphate
Battery Capacity	120 Ah
Rated Voltage	24 VDC
Charging Time	4 hours
Max. Runtime(spot-cleaning)	13 hours
Max. Runtime (regular cleaning)	8 hours
SENSING	3D LiDAR, 3D Depth Camera, Camera, Bumper Sensor
SOUND LEVEL (EN 60335-2-72:2012)	
Sound Pressure Level	≥58 dB (A) L _{pA} , 3dB(A) K _{pA}
Sound Power Level	≥70 dB(A) L _{WA}
VIBRATION AT THE HANDLE	< 2.5 m/s ²
OPERATING ALTITUDE	<2000 m 6561 ft

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

Machine Dimensions



Declaration of Conformity

This Declaration of conformity is issued under the sole responsibility of the manufacturer:

Product name: Commercial Cleaning Robot
Model number: SP50

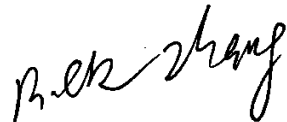
The object of the declaration described above is in conformity with Directives:

2006/42/EC	Machinery Directive
2014/30/EU	Radio Equipment Directive
2014/53/EU	Electromagnetic Compatibility

The following harmonized standards were applied:

EN 60335-2-72:2012
EN 60335-1:2012+A11:2014+A13:2017 +A1:2019+ A14:2019+ A2:2019 + A15:2021
EN 62233:2008
EN IEC 61000-6-2: 2019
EN IEC 61000-6-4: 2019
EN 301 489-1 V2.2.3
EN 301 489-52 V1.2.1
EN 301 908-1 V15.1.1
EN 301 908-13 V13.1.1
EN IEC 62311: 2020

Signed for and behalf of the manufacturer:



Rick Zhang, Chief Product Manager
July 31, 2023



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