

PSD-XS660 Hand Push Double Brush

Instruction Manual



Please read this manual carefully before use

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Chapter one Precautions

1.1 Content and Purpose

The following points out potentially dangerous situations. Read these instructions carefully and take necessary precautions. The essence of this machine operating manual is to prevent injuries. Safety precautions are necessary to avoid accidents. Most accidents happen when working without paying attention to basic safety rules. A careful and cautious user is the best guarantee to avoid accidents, even better than some other preventive measures. When using the machine, always pay attention to your surroundings and nearby people, especially children.

1.2 General Description

- Before any maintenance or repair, please turn the start switch to the off position and remove the key from the main power switch.
- This machine must be used by qualified and authorized personnel. Children and disabled persons are not allowed to use this machine.
- Keep sparks, flames and smoke away from batteries.
- Do not use in locations with dangerous, flammable or explosive gases, liquids or vapors.
- Please keep loose clothing, hair, fingers and any other part of the body away from the air outlet and any moving parts of the machine.
- When the machine stops, pls turn off the power.
- Do not use the machine where the slope exceeds the rated value of the machine.
- Please do not smoke while the battery is charging.
- Do not use the machine in a very dirty area. If the ground is very dusty, please clean it before using the machine.
- The machine should be stored at a temperature between -10 degrees and 40 degrees.
- When using the machine, the temperature should be between -10 degrees and 40 degrees, and the humidity should be between 30% and 95%.
- Do not use the machine as a means of transportation.
- When the machine is not moving forward, do not let the brush continue to rotate to avoid damage to the floor.
- In case of fire, please remember to use a powder fire extinguisher instead of water.
- When a machine operation failure occurs, make sure that the failure is not caused by lack of scheduled maintenance.
- If some parts need to be replaced, you can purchase spare parts from the original manufacturer or authorized dealer.
- To confirm the proper operation and safety condition of the machine, professionals or service

centers must work in accordance with the maintenance chapters of this manual.

- Even when the machine is to be dismantled and scrapped, someone should be there to watch because some hazardous substances (such as batteries, waste oil, etc.) have met the standards and should be sent to a specific center for treatment.

1.3 Safety Requirements For Battery

- The battery must be kept away from low voltage and should be charged as soon as possible
- To avoid leakage, please keep the battery dry and clean, especially remove pollutants such as metal dust
- Do not place metal parts (such as tools) on the battery to prevent the battery from short circuiting and burning
- The charging room should be well ventilated
- **Do not connect or remove the battery when the key switch is in the ON position**
- **Before removing or installing the battery, first disconnect the negative (-) battery wire, then disconnect the positive (+) battery wire. When rewiring, be sure to pay attention to the polarity of the battery, as incorrect connection will damage the electrical components**
- Avoid direct contact between the positive and negative electrodes, as this will cause a large current short circuit, generate high heat and even cause fire.

1.4 General Safety Regulations

In addition to the regulations in this manual, you must also comply with the required general safety regulations and accident prevention guidelines. Even if you have used similar floor scrubbers before, please read the manual carefully. Reading the manual in advance will save you a lot of time in the future. It is very important for you to be familiar with all the accessories and controls and their functions before you start using them. Read this manual thoroughly to avoid being in a hurry after turning on the machine.

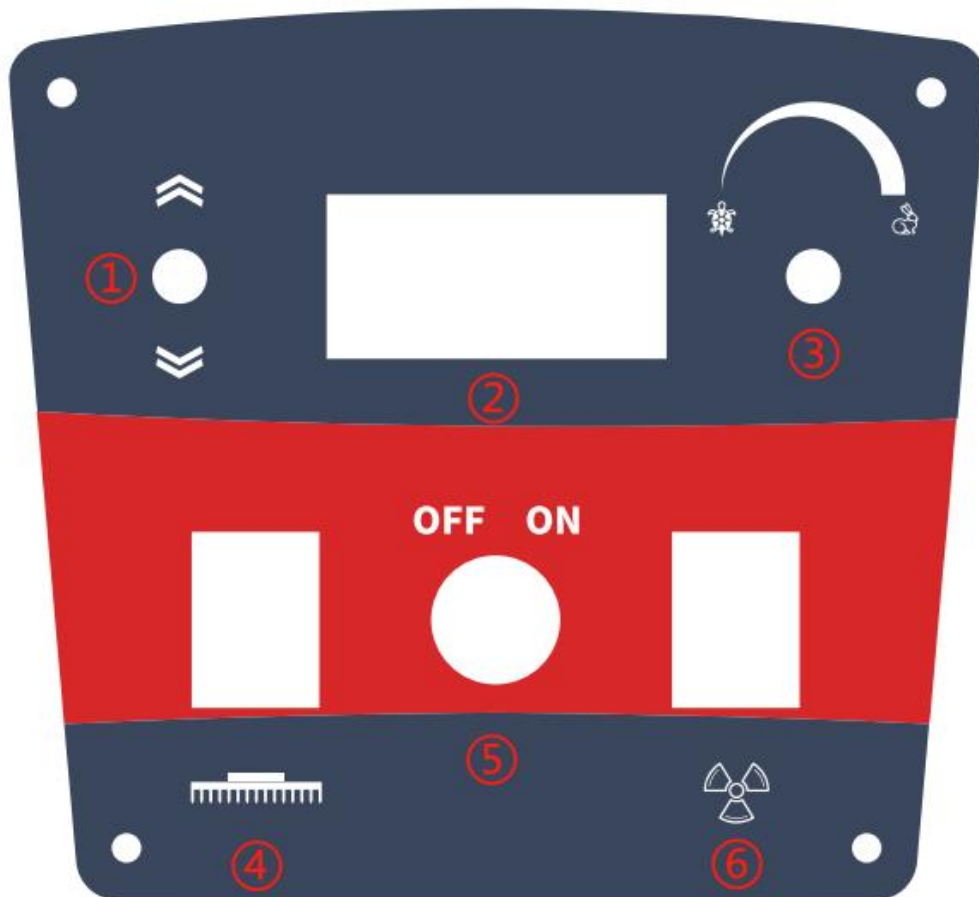
Chapter 2 Performance Parameters

Product	Units	Specifications	Remark
Cleaning efficiency	m ² /h	4500 m ² /h	
Brush width	Inch/piece	13 inch*2	
Width of water absorption	mm	1000mm	
Cleaning width	mm	660mm	
Brushing speed	Rpm	195Rpm	
Swiping motor power	W	24V/380W*2	
Water absorption motor power	W	24V/500W	
Drive motor power	W	24V/300W	
Water tank capacity	L	60L	
Sewage tank capacity	L	65L	
Battery capacity	V/AH	DC24V/100ah	
Working time	H	3-4H	
Weight	KG	115KG (no battery)	
Product Size	mm	1425*900*1075mm	

Chapter three Use of machine

3.1 Machine performance

3.1.1 Control Panel Introduction



XS660 Control Panel

- 1.Forward and reverse switch (can control the forward or reverse direction of the machine)
- 2.Power meter (can display working time, voltage, power, the machine will be powered off when it is lower than 21V, prompting that it needs to be charged in time)
- 3.Speed knob (adjustable forward and reverse speed)
- 4.Brush motor power switch (press this button, put down the brush, and step on the accelerator to start the brush)
- 5.Power switch, emergency stop switch. (Press this button in an emergency and the machine will shut down)
- 6.Water suction fan power switch (press this button to start the water suction motor)

3.1.2 battery charger port

- The socket is located at the bottom of the seat side, and the charging socket cable needs to have a

power cable with a diameter of at least 4mm.

- Note: The charger should be moisture-proof, waterproof and drop-proof.
- Each charging must ensure sufficient charging time (6-8 hours in summer; 6-10 hours in winter). Ensure that the battery is fully charged when working.

3.1.3 Water tank filling

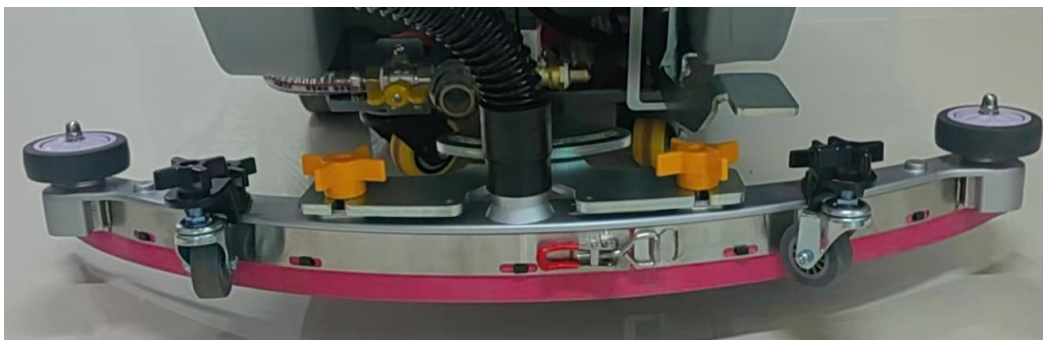
Water filling port: The machine is equipped with a filter as standard. Fill the water tank with clean water. Pay attention to the water quality to prevent clogging of the waterway.



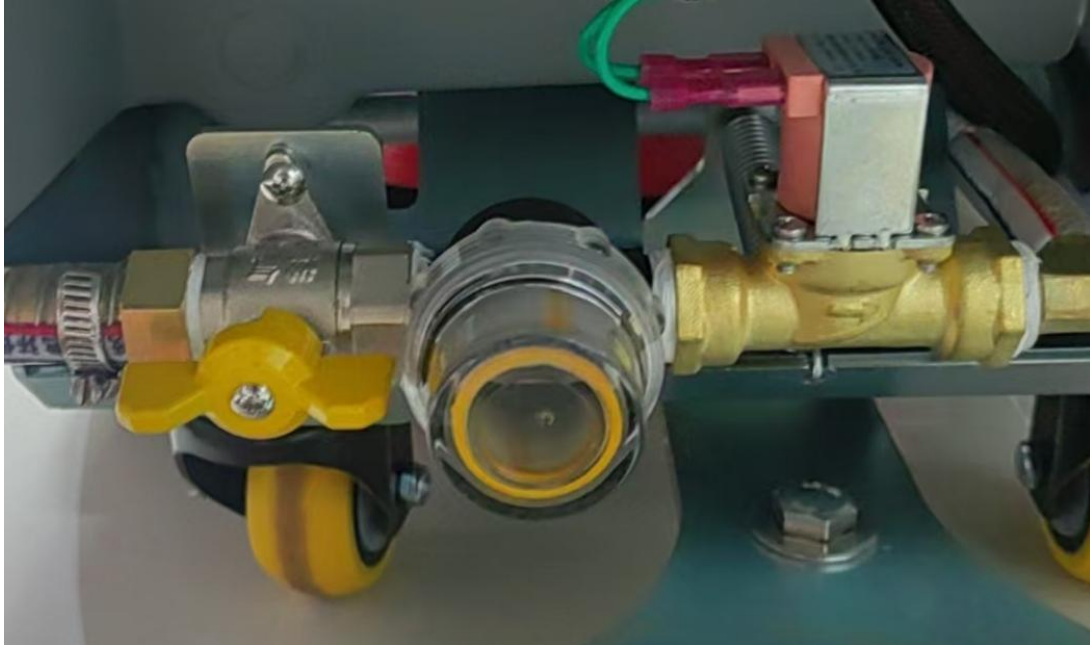
3.2 Machine operation process

3.2.1 Preparation before operation

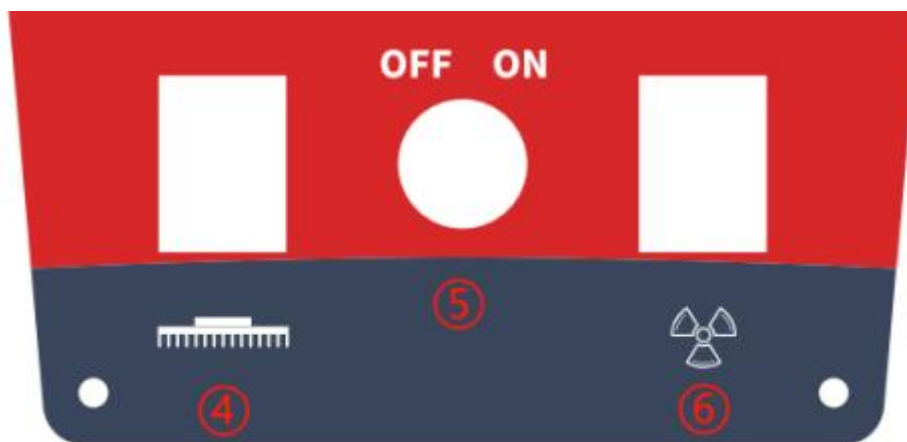
3.2.1.1 Before the machine is operated normally, make sure the squeegee is installed correctly and the sewage suction pipe is inserted into the squeegee suction port.



3.2.1.2 Adjust the water volume to the appropriate position through the water valve switch under the machine head (It depends on the dryness of the ground. The machine must be operated with water brushes. Sufficient water should be maintained during the operation. Do not dry-suction to prevent dust from entering the suction motor and causing the suction motor to malfunction)



3.2.1.4 Turn on the panel work buttons ④ and ⑥, the brush plate and suction scraper will automatically fall down, and press the accelerator pedal to start working



3.2.2 During operation

3.2.2.1 Turn on the power switch and wait for 3 seconds. The controller indicator light (4) will be on and the voltmeter (3) will display the battery voltage. If the voltage is lower than 21V, please charge it immediately.

3.2.2.2 Manually lower the handle of the vacuum cleaner to place it on the ground

3.2.2.3 Step on the brush plate support to lower the brush plate to the ground

3.2.2.4 Press the brush plate button and water absorption button to start working

3.2.2.5 Put the machine into forward gear, press the handle lightly, and keep the machine running steadily (Note: Do not run too fast when cleaning)

3.2.3 After the machine working

3.2.3.1 Turn off the brush plate water absorption switch button, brush the plate, absorb water with delay function, 5-7 seconds

3.2.3.2 Manually pull up the handle of the vacuum cleaner to lift it off the ground;

3.2.3.3 Step on the brush plate bracket to lift the brush plate off the ground

3.2.3.4 Turn off power switch.

3.3 Precautions for machine operation

3.3.1 Avoid leaving the machine and the brushes clean for long periods of time in the same place; this can leave unnecessary marks on the floor

3.3.2 When cleaning epoxy floor, you need to add a scouring pad or replace the soft brush to avoid the brush from wearing the epoxy floor

3.3.3 When filling the machine with clean water, make sure the water is clean to prevent the drain valve and filter from being clogged by impurities and causing water to not flow out

3.3.4 After the machine has been working for a period of time, the sewage in the sewage tank must be discharged in time to prevent excessive sewage from entering the suction motor and causing damage

3.3.5 When cleaning the floor with serious oil pollution, please put an appropriate amount of detergent in the clean water tank to achieve better cleaning effect. At the same time, drop an appropriate amount of defoaming agent into the sewage tank to prevent the foam in the sewage tank from soaking into the suction motor and causing burning.

3.3.6 After each work is completed, please flush the sewage tank in time to keep the machine well maintained.

3.3.7 After winter operation, please drain the water from the water tank in time to avoid freezing and affecting the next use.

3.4 Storage and maintenance of the machine

3.4.1 Be sure to follow the daily, weekly, and monthly maintenance procedures to keep your machine in top working condition.

3.4.1.1 Daily maintenance (after each use)

① Drain and clean the sewage tank

- ② Drain the clean water tank and clean it with hot water not higher than 60 degrees as needed③ Remove the scouring pad and brush for cleaning. If there is wear, turn over or replace the scouring pad
- ④ Wipe the absorbent strip and lift it up to prevent it from being damaged
- ⑤ Check the wear of the edge of the water-absorbing rubber strip. If there is any wear, swap the two sides of the rubber strip up and down
- ⑥ Use a multi-purpose cleaner and a damp cloth to wipe the machine. For safety reasons, do not use high-pressure spray or hose to clean the machine. This may cause electronic parts failure
- ⑦ Check the brush head skirt for wear and replace if worn or damaged
- ⑧ To extend the life of the battery and ensure the best performance of the machine, the battery must be charged after the machine has been used for at least 30 minutes

3.4.1.2 Monthly Maintenance

- ① Remove the solution tank filter from underneath the machine and clean the screen, making sure to empty the solution tank before removing the filter
- ② Clean the top of the battery to prevent electrode corrosion
- ③ Check if the battery connection cable is loose
- ④ Check and clean the sewage tank cover seal and replace it if damaged
- ⑤ Spray silicone dry lubricant on all pivots and rollers, and then cover with a layer of waterproof lubricant to keep the axles running smoothly
- ⑥ Check whether the nuts and bolts on the machine are loose
- ⑦ Check the machine for leaks

3.4.1.3 Quarterly maintenance

- ① Check the wear of the drive motor, vacuum motor and brush motor every 250 hours. When the length of the carbon brush is worn within 10 mm, it is necessary to replace the carbon brush. If the machine needs to be repaired, please contact an authorized service center.
- ② **Regularly (monthly/weekly) clean the squeegee assembly and suction/discharge pipe assembly, as well as the machine water filter to keep all piping systems in optimal working condition at all times, and replace consumables regularly.**
- ③ **Clean the suction motor filter element at the float port regularly according to the working environment to prevent garbage from clogging the filter screen and affecting the suction motor's work if it is not cleaned for a long time. After cleaning the filter cotton each time, it must**

be installed back in place in time. Do not miss any components and tightly cover the float cover



WARNING: Risk of electric shock. Disconnect battery cables before servicing machine.

3.4.2 Moving the machine

When moving the machine on a truck or trailer, always follow the following tying procedures

- ① Raise the brush head to the carrying position and load the machine using the recommended loading dock
- ② Place the front of the machine close to the front of the truck or trailer. After the machine is properly placed, lower the brush head and turn off the power
- ③ Place a barrier behind each drive wheel to prevent the machine from sliding
- ④ Use ropes to secure the top of the machine to prevent tipping. You must always install the brackets on the bed of the truck or trailer. FOR SAFETY: When moving the machine, use the recommended loading dock to load and unload the machine from the truck or trailer and secure the machine to the bed with ropes

3.4.3 Storage of machines

- ① Please charge the battery before storage. Do not store it when the battery is exhausted.
- ② Drain and rinse the sink box thoroughly
- ③ Store the machine in a dry place with the brush head in the raised position
- ④ Open the sewage tank cover for ventilation. Note: Do not expose the machine to rain and store it indoors
- ⑤ If you store the machine in a cold environment, be sure to drain all liquid from the machine.

Chapter 4 Daily Maintenance and Replacement of Wearing Parts

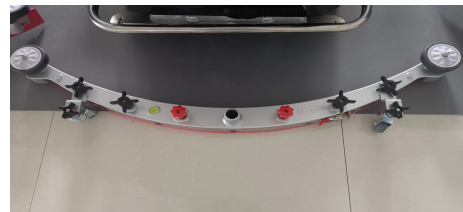
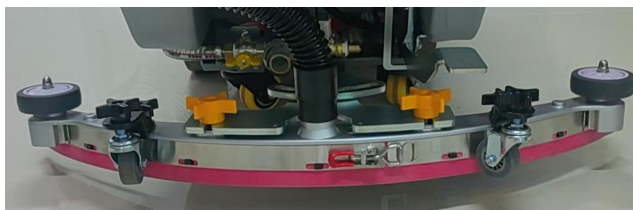
4.1 Regular inspection

Regular maintenance and inspection		Interval time (h)				
		4	50	100	200	500
1	Battery level detection	√				
2	Is the main brush wired or entangled	√				
3	Check if there is any debris in the water tank	√				
4	Check the buttons and electronic products on the control panel		√		√	
5	Check the wear of the brush strips		√	√		
6	Check the filter for impurities	√				

4.2 Replacement and installation of rubber

1 Park the machine on a flat surface, turn off the main power switch, and ensure that the machine is powered off.

2 Lower the squeegee by pulling the handle; rotate the plastic handle in the opposite direction and remove the squeegee assembly.



3 Unscrew the nut of the squeegee assembly, remove the bottom plate of the squeegee assembly, and remove the front and rear rubber strips of the squeegee



4 Install the squeegee strips.

1. Align the front rubber strip hole with the protrusion of the squeegee plastic component.
2. Fix the plastic component to the cast aluminum base of the squeegee.

3. Align the rear rubber strip hole with the protrusion of the squeegee plastic component.
4. Use the two ends of the pressure strip to clamp it.
5. Tighten the nut



4.3 Battery Maintenance

The power system of the push-type floor scrubber is powered by two 12V maintenance-free lead-acid batteries in series, with a system voltage of 24V.

1. After the machine has been operating for a period of time, the battery power decreases, the power meter has two bars left or the brush motor does not work, indicating that the power is insufficient and needs to be charged in time;
2. When maintaining the battery, please wear protective gloves to avoid contact with battery acid;
3. Check whether the battery connection wire is worn and whether the contact parts are loose, and replace them if necessary;
4. The battery terminal should be kept clean and dry, and no debris or dust should be covered on it, which is extremely bad for the battery and will burn the battery in serious cases.

!!! Note

- ◆ In order to make the battery have a long service life, it should be charged in time after the machine operation is completed. Deep discharge is strictly prohibited.
- ◆ Correct charging method of lead-acid battery: plug in the battery first, then plug in the mains; after full charge, disconnect the mains first, then unplug the battery plug.
- ◆ If the machine is not used for a long time, please fully charge the battery, disconnect the positive pole of the battery, and store it.

!!! Warn

- ◆ During the use of the battery, deep discharge will reduce the battery capacity and shorten its life.

4.4 Precautions and disassembly of suction motor

1. After daily use of the machine, please drain the sewage from the sewage tank in time to prevent the water level from being too high and being sucked into the suction motor, burning the motor.
2. During the use of the machine, if there is too much foam, it is recommended to use a defoaming agent solution to prevent the foam from entering the filter and the suction motor, causing the motor to burn.
3. Disassembly of the suction motor: The suction motor is fixed at the bottom of the sewage tank.
 - 3.1 Disassembly method of the suction motor: 1 First empty the sewage tank sewage; 2 Turn off the main power switch and keep the machine powered off; 3 Turn the sewage tank sideways, pull out the suction motor socket to loosen the suction motor fixing nut; 4 Take out the suction motor.
 - 3.2 Installation method of the suction motor: 1. Align the suction motor installation hole with the sewage tank screw and put it in, and tighten it with an anti-slip nut 2. Plug the suction motor socket into the machine line to complete the installation

4.5 Controller Function, Diagnosis and Disassembly

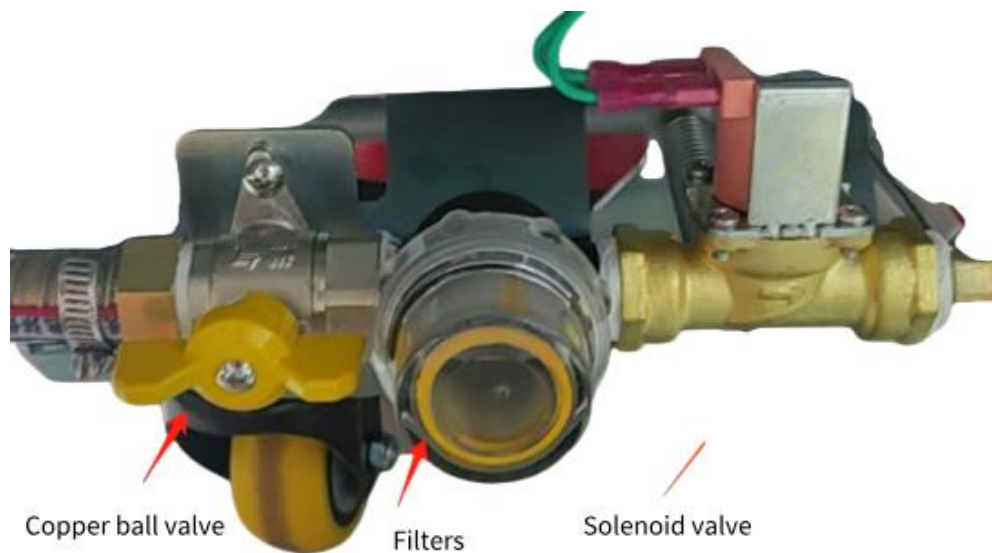
1. Machine controller; fixed inside the control box below the panel console.
2. **Driving function:** full-bridge power MOSFET control, to achieve stepless control of forward, backward, driving, braking, soft start and flexible braking.
Host operation: full-bridge power MOSFET control, to achieve stepless control of forward, backward, driving, braking, soft start and flexible braking.
3. **Downhill speed limit and anti-slip function:** do not exceed the maximum allowed speed when going downhill, and slip speed limit when parking.
4. **Braking function:** when the brake switch is effective, the vehicle will immediately slow down and brake, and finally stop.
5. **Diagnostic function:** the number of times the panel indicator light flashes can be observed to determine the corresponding fault cause. For example: when the controller fails, the control panel indicator light flashes 7 times in a row, pauses for 2-3 seconds, and then flashes 7 times in a row, and so on.

DC1 Fault Codes

error code	LED flashing	Fault content	Troubleshooting
E[01]	Flash 1 time	Precharge failure 1	1. The brake output is short-circuited to ground. 2. The controller's walking motor control MOS is damaged or the brake control MOS is damaged. Troubleshooting method: Remove the brake from the controller. If the fault disappears, check whether the brake is short-circuited to ground. If the fault does not disappear, it is an internal fault of the controller.
E[03]	Flash 3 time	PVDD1 Overvoltage fault	P2-1 voltage exceeds 34V
E[04]	Flash 4 time	PVDD1 Undervoltage fault	P2-2 voltage lower than 12V
E[07]	Flash 7 time	12V-CPU Overvoltage fault	Controller internal failure
E[08]	Flash 8 time	12V-CPU Undervoltage fault	Controller internal failure
E[12]	1 slow and 2 fast	Key switch overvoltage fault	P4-14/13 voltage higher than 34V
E[13]	1 slow and 3 fast	Key switch undervoltage fault	P4-14/13 voltage lower than 12V
E[14]	1 slow and 4 fast	Battery undervoltage fault	battery voltage is higher than 34V
E[15]	1 slow and 5 fast	Battery overvoltage fault	battery voltage is lower than 12V
E[16]	1 slow and 6 fast	Battery voltage limit low fault	battery voltage is lower than 12V
E[17]	1 slow and 7 fast	High battery voltage limit fault	battery voltage is higher than 36V
E[25]	2 slow and 5 fast	UART Overvoltage fault	Controller internal failure
E[26]	2 slow and 6 fast	UART Undervoltage fault	Controller internal failure
E[29]	2 slow and 9 fast	Relay 1 connection failure	Travel motor short circuit or electromagnetic brake short circuit
E[30]	Flash slowly 3 times	Walking motor phase A NTC fault	Controller internal failure
E[31]	3 slow and 1 fast	Walking motor B phase NTC fault	Controller internal failure
E[32]	3 slow and 2 fast	Brush motor NTC failure	Controller internal failure

4.6 Disassembly and assembly of solenoid valve and filter

1. Disassembly and assembly of the filter: The filter is located in front of the front wheel of the machine. After using it for a period of time, if you find that the machine has a small amount of water output or no water output, most of the reasons are that the filter particles are blocked. You need to loosen the transparent cover at the bottom of the filter, pull out the internal filter and clean it.
2. Disassembly and assembly of the solenoid valve: The solenoid valve is located just above the water suction pad and is fixed together by the filter; when replacing, just unscrew the filter and pull out the solenoid valve outlet pipe. (Note: During installation, the clean water pipe is completely in and out of the solenoid valve outlet nozzle to prevent it from loosening.)



Chapter 5 Analysis table of common problems of scrubbers

Problem	Reason	Processing method
Machine cannot operate	Battery is not electric	Battery charging
	Battery fault	Replace the battery
	Battery wiring loose	Tighten the battery wiring
Brush disc motor does not work	Brush leave the ground	lower Brush
	Circuit circuit broken router triggering power jumping	Reset the brush circuit circuit breaker button
	Main brush switch failure	Please contact the service center
	Carbon brush wear	Please contact the service center
Fan not working	Sewage tank full	Discharge sewage in time
	Insufficient voltage	Please charge in time
	Suction motor burnt out	Replace the suction motor
	Carbon brush wear	Please contact the service center
Small or no water outflow	Clean water tank filter is clogged	Clean or replace the clean water tank drain valve
	Solenoid valve damage	Replace the solenoid valve
Low efficiency of	The sewage pipe is blocked	Clean the sewage pipe regularly and in a timely manner

wastewater recycling	sewage tank is full	Drain the sewage tank
	Water absorption glue strip wear	Replace the water absorption
	Wind-absorbing motor failure	Replace the wind-absorbing motor
	Damage to sewage tank sealing	Replace the sealing strip
Shortened working time	Two battery voltage is not equal	Please contact the service center
	Battery charging failure	Maintenance or replacement charger

Chapter 6 Maintenance

The life and operation of the machine must be ensured by the correct and conventional maintenance of the machine. The following will make conventional maintenance requirements. Under suitable working conditions, the time interval of maintenance can be changed, which must be determined by professionals responsible for maintenance.

If the maintenance operation is performed, the machine stops (unplugged the switch key), so please read the instructions carefully about safety chapters.

Use conditions:

Environmental temperature: -10 °C ~ 40 °C;

The relative humidity of the air: 5 % to 70 %;

Non-conductive dust environment without explosion

Environments without corrosive gases or vapors

Indoor use, ventilated, vibration free environment, with a minimum front and rear space of 300mm

Maintenance schedule:

Maintenance Operations	Delivery time	Every 10h	Every 50h	Every 100h	Every 200h	Every 500h
Inspection of brush disc height adjustment						
Whether the disk is wired and the silk is wrapped						
Clean and inspect the integrity of the suction scraper						
Inspection of sealing strip for water tank cover						

Maintenance Operations	Delivery time	Every 10h	Every 50h	Every 100h	Every 200h	Every 500h
Screw and nut tightening inspection						
Check the wear of the brush disc						
Replacement of water absorbing adhesive strip						

Warranty scope:

- Under the following usage conditions, there is no warranty
- Failure to carry out maintenance according to the maintenance manual, resulting in mechanical damage or malfunction
- Significant damage to the mechanical appearance or structure caused by improper human operation
- Dismantling or modification without the consent and approval of the original factory
- Damage caused by weather or force majeure
- Exceeding the warranty period of 1 year or using for more than 1500 hours

