

# **XJ860Pro driving floor scrubber**

## **operation instructions**



**Please read carefully before use**

## catalogue

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# Chapter 1 Explanation

## 1.1 Content and Purpose

The following content points out potential hazardous situations. Carefully read these instructions and take necessary preventive and protective measures. The essence of this machine operation manual is to prevent injury. Safe prevention without accidents is necessary. Most accidents occur during work without paying attention to basic safety rules. A careful and cautious user is the best guarantee to stay away from accidents, even stronger than some other preventive measures. When using the machine, be sure to pay attention to your surroundings and nearby people, especially children.

## 1.2 General Instructions

- 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 individuals are not allowed to use this machine.
- Keep the battery away from sparks, flames, and smoke.
- Do not use in places with dangerous, flammable, or explosive gases, liquids, or water vapor.
- Please keep loose clothing, hair, fingers, and any other part of your body away from the machine's vents and any moving parts.
- Remember to turn off the power when the machine stops.
- Do not use the machine in areas where the slope exceeds the rated value of the machine.
- Please do not smoke while charging the battery.
- Do not use this machine in very dirty areas. If there is thick dust on the ground, please clean it before using this product 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 ground.
- In case of a fire, please remember to use a powder fire extinguisher instead of using water to extinguish the fire.
- When machine operation malfunctions, it is important to ensure that the problem is not caused by a 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 conditions of the machine, professionals or service

centers must follow the relevant maintenance sections of this manual.

- Even when the machine needs to be dismantled and scrapped, someone should be present to pay attention. Because certain harmful substances (such as batteries, waste oil, etc.) have met the standards and should be sent to specific centers for treatment.

### 1.3 Safety requirements related to batteries

- It is necessary to avoid the battery being in a low voltage state and charge it as soon as possible;
- To avoid leakage, please keep the battery dry and clean, especially removing pollutants such as metal dust;
- Do not place metal parts (such as tools) on the battery to prevent it from short circuiting and burning out;
- The charging room should have good ventilation;
- **Do not connect or disconnect the battery when the key switch is in the ON position;**
- **Before disassembling the battery, disconnect the negative (-) battery wire first, and then disconnect the positive (+) battery wire. When rewiring, be sure to pay attention to the polarity of the battery, as incorrect connections can damage electrical components;**
- Avoid direct contact between the positive and negative electrodes, as it can cause high current short circuits, generate high heat, and even have the possibility of fire.

### 1.4 General Safety Regulations

In addition to the provisions made in this manual, it is also necessary to comply with the required general safety regulations and accident prevention guidelines. Even if you have used a similar floor scrubber before, please read the instructions carefully. Reading the manual in advance will save you a lot of time in the future. It is crucial for you to be familiar with all the accessories, controls, and their functions before starting to use them. Read this manual thoroughly to avoid getting flustered after turning it on.

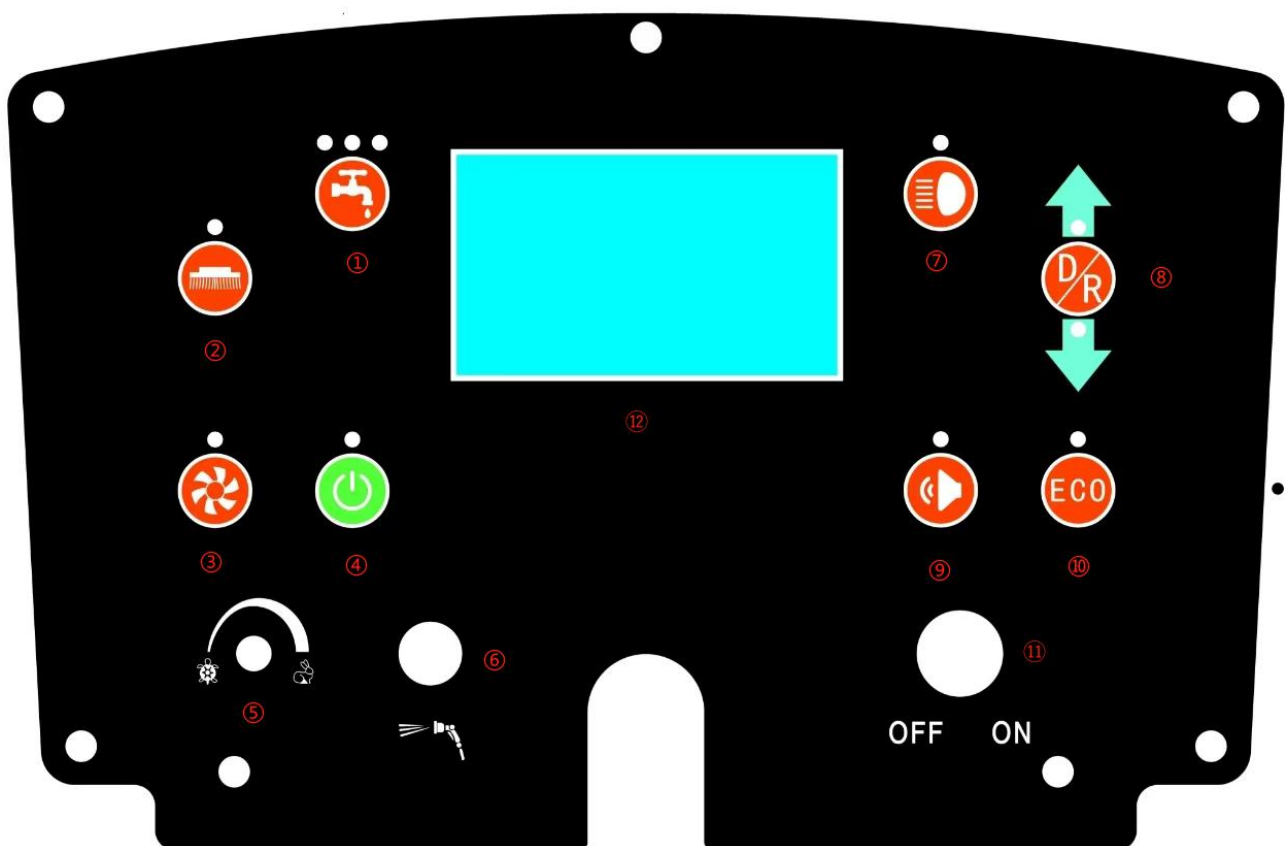
## Chapter 2 Performance Parameters

product name	unit	Specification and model	notes
cleaning efficiency	m <sup>2</sup> /h	8000 m <sup>2</sup> /h	
Brush width	Inch/piece	16 inches * 2	
Squeegee Width	mm	1000mm	
Cleaning width	mm	1150mm	
Brush disk speed	Rpm	225Rpm	
Brush disk motor power	W	24V/500W*2	
Water absorption motor power	W	24V/500W	
Drive motor power	W	24V/600W	
Clear water tank capacity	L	150L	
Capacity of sewage tank	L	160L	
battery capacity	V/AH	DC24V/200ah	
working hours	H	5-6H	
Whole machine weight	KG	386KG	
Product size	mm	1610*1200*1380mm	

## Chapter 3: Use of Machines

### 3.1 Machine Performance

#### 3.1.1 Introduction to Control Panel



#### XJ860Pro Control Panel

- ① Water volume adjustment button
- ② **Brush disk button**
- ③ Water absorption motor button
- ④ One key start button
- ⑤ Speed adjustment knob
- ⑥ High pressure water gun button
- ⑦ Lighting button
- ⑧ Forward/backward button (reverse, suction scraper will automatically lift, suction brush disc cannot work)

- ⑨ Horn button
- ⑩ ECO button
- ⑪ Key emergency stop switch button (press this button in case of emergency, the machine will power off and stop)
- ⑫ The instrument display screen can show working time, voltage, and battery level. If it is below 21V, the machine will power off and prompt the need for timely charging

### 3.1.2 Charging socket for battery

- The socket is located below the seat side, and the charging socket requires a power cord with a diameter of at least 6mm.
- Attention: The charger should be moisture-proof, waterproof, and drop proof.
- Each charging must ensure sufficient charging time (6-8 hours in summer and 6-10 hours in winter). Ensure that the battery is fully charged during operation.

### 3.1.3 Adding water to the water tank

**Water inlet:** The machine comes with a standard water inlet hose, which can be pulled out to add water. Before using the machine, open the water tank cover and inject clean water into the water tank. Pay attention to the cleanliness of the water quality to prevent blockage of the waterway.

**Drainage outlet:** The machine comes with a standard drainage hose, which can be pulled out to drain water. When winter comes, after using the machine, it is necessary to promptly drain the clean water from the water tank to avoid freezing and affecting its reuse.



## 3.2 Operation process of the machine

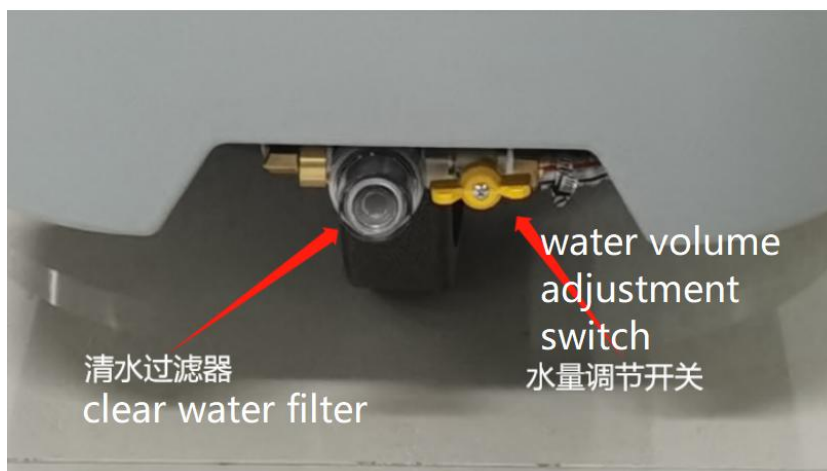
### 3.2.1 Preparation before operation

3.2.1.1 Before normal operation of the machine, confirm that the suction scraper has been installed correctly and that the suction pipe is inserted into the suction nozzle of the scraper



3.2.1.2 Adjust the water volume to the appropriate position through the water valve switch under the machine head (depending on the dryness of the ground)

**It depends on the degree, the machine must be operated with a water brush on the ground, and sufficient water should be maintained during the working process. Do not dry suction to prevent dust from entering the suction motor and causing it to malfunction. )**



3.2.1.3 Install the brush disc cover onto the brush disc bracket and tighten it with a plastic knob.





3.2.1.4 Open panel work buttons 2 and 3 or ④, and the brush disc and suction scraper will automatically fall down. Press the accelerator pedal to start working.



### 3.2.2 During the operation process

**3.2.2.1 Turn on the power switch and wait for 3 seconds. The controller indicator light (4) will remain on, and the voltmeter (3) will display the battery voltage value. When the voltage is below 21V, please charge it promptly**

3.2.2.2. Press the work button to brush the disc and absorb water, then put down the brush disc and absorb water to remove it.

3.2.2.3 Set the machine to forward gear, lightly step on the accelerator pedal, and keep the machine running smoothly (note: do not drive too fast during cleaning)

3.2.2.4 If rapid stopping or operation on a sloping surface is required, the machine can be controlled by releasing the accelerator pedal.

### 3.2.3 After the operation is completed

3.2.3.1 Turn off the brush disc suction switch button, and the brush disc and suction scraper will automatically stop working (the suction has a delay function, 5-7 seconds).

3.2.3.2 Turn off the main power switch.

### 3.3 Precautions for machine operation

3.3.1 Avoid stopping the machine in the same place for a long time and allowing the brush to clean; This will leave unnecessary marks on the ground.

When cleaning epoxy flooring, it is necessary to add a scouring pad or replace the soft bristle brush to prevent the brush from wearing the epoxy flooring

3.3.3 When adding clean water to the machine, it is important to ensure that the water quality is clean to prevent impurities from blocking the drain valve and filter screen, which may prevent water from flowing out

3.3.4 After the machine has been working for a period of time, it is necessary to promptly discharge the sewage from the sewage tank to prevent excessive infiltration of sewage into the suction motor and damage.

3.3.5 To clean the ground with serious oil pollution, please put an appropriate amount of detergent in the clean water tank to achieve better cleaning effect, and at the same time, drip an appropriate amount of defoamer in the sewage tank to prevent the foam in the sewage tank from soaking in the air suction motor and causing burning

3.3.6 After each work is completed, please rinse the sewage tank in a timely manner to keep the machine well maintained.

3.3.7 After winter operation, please discharge the clean water from the water tank in a timely manner to avoid freezing and affecting reuse.

### 3.4 Storage and Maintenance of Machines

**3.4.1 It is necessary to strictly follow the daily, weekly, and monthly maintenance procedures in order to keep the machine in optimal working condition.**

3.4.1.1 Daily maintenance (after each use)

**Drain and clean the sewage tank.**

Drain the clean water tank and clean it with hot water not exceeding 60 degrees Celsius as needed.

Remove the scouring pad and brush for cleaning. If there is wear and tear, flip or replace the scouring pad.

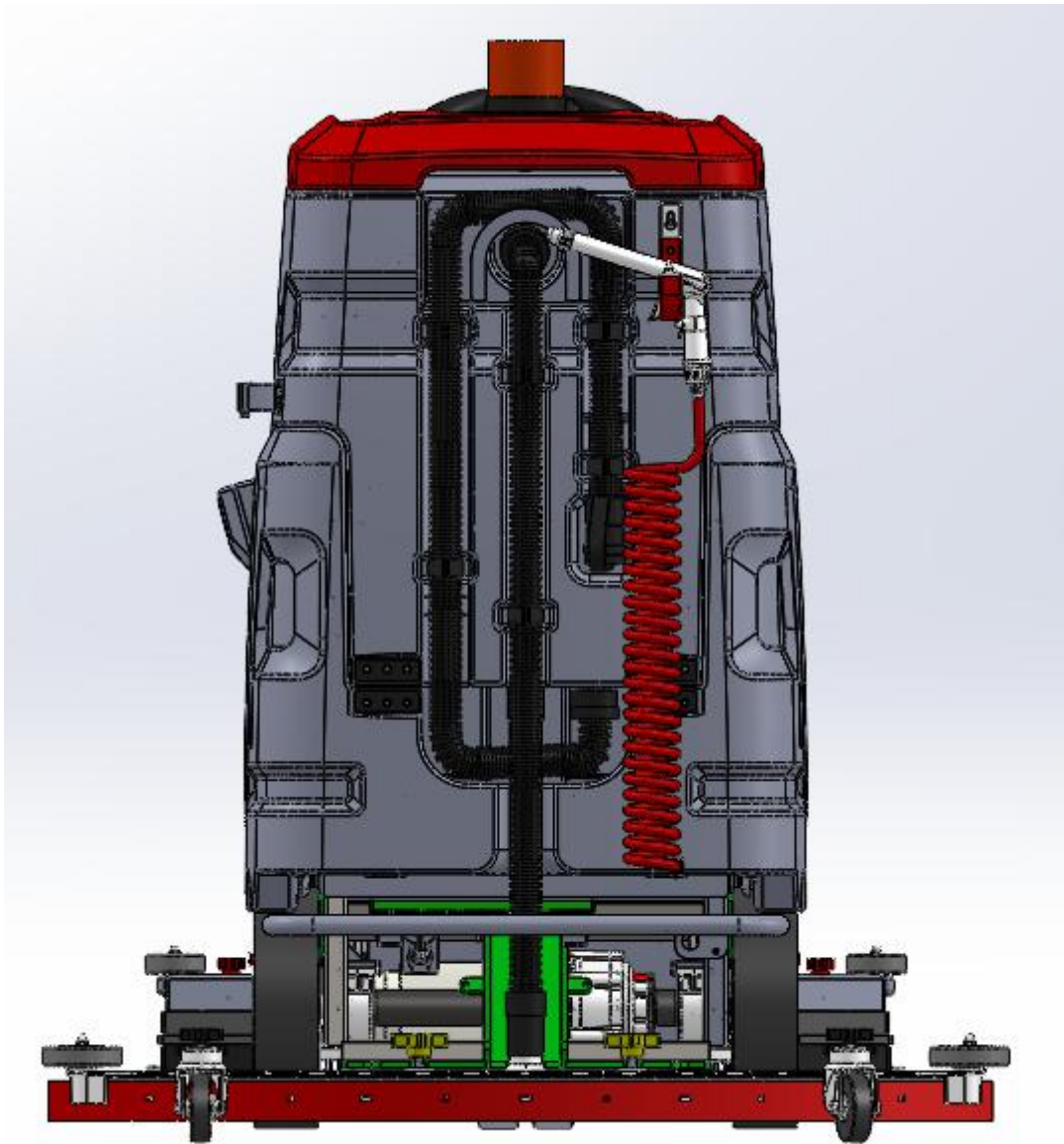
**Wipe the absorbent strip and lift it up to prevent damage to the strip.**

**Check the wear condition of the edge of the water absorbing rubber strip. If there is any wear, adjust the two sides of the rubber strip up and down.**

Use a multi-purpose cleaner and a damp cloth to wipe the machine. For safety reasons, do not use high-pressure spraying or water pipes to rinse the machine when cleaning. To avoid electronic component malfunctions.

Check the wear of the brush head skirt and replace it if there is any wear or damage.

To charge the battery, in order to extend its lifespan and ensure optimal performance of the machine, it is necessary to wait for at least 30 minutes of machine usage before charging the battery.



#### 3.4.1.2 Monthly Maintenance

Remove the water tank filter from under the machine and clean the filter screen, ensuring to empty the water tank before removing the filter.

Clean the top of the battery to prevent electrode corrosion.

Check if the battery connection wire is loose.

Check and clean the sealing strip of the sewage tank cover, and replace it if it is damaged.

Spray silicone dry lubricant on all pivot shafts and rollers, and then cover them with a layer of waterproof lubricant to ensure smooth operation of the wheel axle.

Check if the nuts and bolts on the machine are loose.

Check if the machine is leaking.

#### 3.4.1.3 Quarterly maintenance

Check the wear of the drive motor, vacuum motor, and brush disc motor every 250 hours. When the length of the carbon brush wears out within 10 millimeters, it needs to be replaced. If the machine needs to be sent for repair, please contact an authorized service center. 2. Regularly (monthly/weekly) clean the suction scraper components and suction/discharge pipe components, as well as the machine's clean water filter screen, to keep all piping systems in optimal working condition at all times, and regularly replace consumables. 3. Regularly clean the filter element of the suction motor at the float port according to the working environment to prevent garbage from

blocking the filter and affecting the operation of the suction motor. After cleaning the filter cotton each time, it must be promptly reinstalled in its original position, without missing any components, and the float cover should be tightly closed.



**Warning: Electric shock hazard. Please disconnect the battery connection cable before repairing the machine.**

#### **3.4.2 Handling Machinery**

When using trucks or trailers to transport machinery, please be sure to follow the following bundling procedures

Raise the brush head to the handling position and use the recommended loading dock to load the machine.

Place the front of the machine close to the front of the truck or trailer, place the machine properly, lower the brush head, and turn off the power.

Place obstacles behind each driving wheel to prevent the machine from sliding.

Use ropes to secure the top of the machine to prevent tilting. You must install brackets on the truck or trailer board.

For safety reasons: When handling the machine, please use the recommended loading and unloading platform to load and unload the machine from the truck or trailer, and secure the machine to the vehicle board with ropes.

#### **3.4.3 Storage Machine**

Please charge the battery before storage and do not store it when the battery is fully charged.

Thoroughly drain and rinse the sink box in the sink.

Store the machine in a dry place and keep the brush head in a raised position.

Open the sewage tank cover for ventilation. Caution: Do not expose the machine to rain and store it indoors.

If storing the machine in a cold environment, please ensure that all liquids inside the machine are completely drained.

## Chapter 4 Daily Maintenance and Replacement of Vulnerable 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 and wrapped with silk	√				
3	Check for debris in the water tank	√				
4	Check the buttons and electronic products on the control panel		√		√	
5	Check the wear level of the brush rubber strip		√	√		
6	Check if there are impurities in the filter	√				

### 4.2 Brush disk replacement and installation

4.2.1 Park the machine on a flat surface and put down the floor scrubber.

4.2.2 Rotate the plastic cross nut counterclockwise to remove the brush disc cover

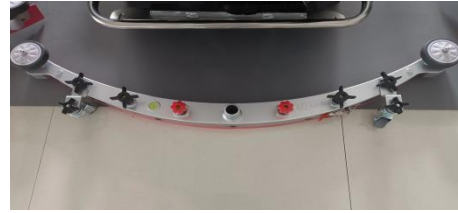
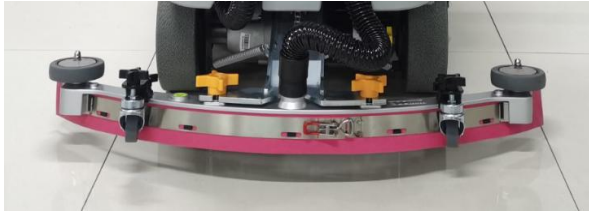
4.2.3 Press the brush disk work button again, lift the floor cleaning brush disk, grasp the brush disk holder, slightly lift it up, quickly rotate left and right, and the brush disk can be removed; When installing the brush disk, ensure that the flange is aligned with the brush disc buckle hole and quickly rotate it towards the go kart direction to complete the installation. Tips:



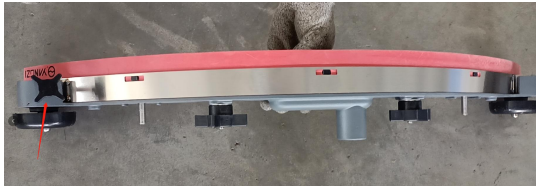
### 4.3 Replacement and installation of absorbent rubber strip

Park the machine on a flat surface, turn off the main power switch, and ensure that the machine is in a power-off state.

2. Use lifting hands to lower the water absorbing scraper; After rotating the plastic handle in reverse, remove the water absorbing scraper component.



3. Unscrew the nut of the suction scraper component, remove the bottom plate of the suction scraper component, and remove the front and rear rubber strips of the suction scraper



Install the water absorbing rubber strip.

1. Align the front rubber strip hole with the protrusion of the absorbent plastic component.
2. Fix the plastic components onto the water absorbing cast aluminum base plate.
3. Align the rear rubber strip hole with the protrusion of the absorbent plastic component.
4. Secure both ends of the pressure strip.
5. Tighten the nut



## 4.4 Battery maintenance and upkeep

The XJ600/XJ660 floor scrubber power system is powered by two 12V maintenance free lead-acid batteries connected in series, with a system voltage of 24V.

1. When the machine has been operating for a period of time and the battery level drops, leaving two grids of electricity on the meter or the brush motor not working, it indicates that the battery level is insufficient and needs to be charged in a timely manner;

When maintaining the battery, please wear protective gloves to avoid contact with acidic substances in the battery;

3. Check whether the battery connection wire is worn and whether the contact parts are loose, and replace them if necessary;

4. The battery terminals should be kept clean and dry, without any debris or dust covering them, which is extremely detrimental to the battery

In severe cases, it can burn the battery.



**!!! pay attention to**

**To ensure the battery has a long service life, it should be charged promptly after the machine is operated, and deep discharge is strictly prohibited.**

**The correct charging method for lead-acid batteries: first plug in the battery, then plug in the mains power; After being fully charged, first disconnect the mains power and then disconnect the battery plug.**

If the machine is not used for a long time, please fully charge the battery and disconnect the positive terminal of the battery before storing it.

**!!! warn**

**◆ During the use of batteries, the capacity of deep discharge batteries will decrease and their lifespan will be shortened.**

#### **4.5 Precautions and disassembly of suction motor**

1. After daily use of the machine, please discharge the sewage from the sewage tank in a timely manner to prevent the water level from being too high and being sucked into the suction motor, which may burn out the motor.
2. If there is too much foam during the use of the machine, it is recommended to use defoamer solution to prevent foam from entering the filter screen, entering the suction motor and causing the motor to burn.
3. Disassembly of suction motor: The suction motor is fixed at the bottom of the sewage tank.
  - 3.1 Disassembly method of suction motor: 1. Drain the sewage tank first; 2. Turn off the main power switch and keep the machine powered off; 3. Flip the sewage tank over and remove the suction motor from the socket to loosen the fixing nut of the suction motor; 4. Remove the suction motor.
  - 3.2 Installation method of suction motor: 1. Align the installation hole of the suction motor with the screw of the sewage tank and tighten it with anti slip nuts. 2. Connect the suction motor socket to the machine circuit to complete the installation.

#### **4.6 Controller Function, Diagnosis, and Disassembly and Assembly**

1. Machine controller; Fixed inside the control box below the panel console.
2. Drive function: Full bridge power MOSFET control, achieving stepless control of forward, backward, drive, and brake, realizing soft start and flexible braking.

**Host operation: Full bridge power MOSFET control, achieving stepless control of forward, backward, driving, and braking, realizing soft start and flexible braking.**

3. Downhill speed limit and anti slip function: When driving downhill, do not exceed the maximum allowed speed, and when parking on a slope, reverse slip speed limit.
4. Braking function: When the brake switch is activated, the vehicle immediately decelerates and brakes, ultimately coming to a stop.
5. Diagnostic function: It can observe the number of flashes of the panel indicator light to determine the corresponding cause of the fault. For example, when the controller malfunctions,

the control panel indicator light flashes continuously 7 times, pauses for 2-3 seconds, and then flashes continuously 7 times, repeating this process.

### SA860\_DC18 fault code

Fault code	LED flashing	Fault content	Troubleshooting
E[01]	Flash flash once	Pre charge fault 1	1. Brake output short circuit to ground 2. Controller walking motor control MOS damaged or brake control MOS damaged Troubleshooting method: Remove the brake from the controller. If the fault disappears, check if the brake is short circuited to ground. If the fault does not disappear, it is an internal fault of the controller
E[03]	Flash flash 3 times	PVDD1 overvoltage fault	P2-1 voltage exceeds 34V
E[04]	Flash flash 4 times	PVDD1 undervoltage fault	P2-2 voltage below 12V
E[07]	Flash flash 7 times	12V-CPU overvoltage fault	Internal malfunction of controller
E[08]	Flash flash 8 times	12V-CPU undervoltage fault	Internal malfunction of controller
E[12]	One slow, two fast	Key switch overvoltage fault	P4-14/13 voltage higher than 34V
E[13]	One slow, three fast	Key switch undervoltage fault	P4-14/13 voltage below 12V
E[14]	One slow, four fast	Battery undervoltage fault	The battery voltage is higher than 34V
E[15]	One slow, five fast	Battery overvoltage fault	The battery voltage is below 12V
E[16]	One slow, six fast	Low battery voltage limit fault	The battery voltage is below 12V
E[17]	One slow, seven fast	High battery voltage limit fault	The battery voltage is higher than 36V
E[25]	Two slow and five fast	UART overvoltage fault	Internal malfunction of controller
E[26]	Two slow and six fast	UART undervoltage fault	Internal malfunction of controller
E[29]	Two slow and nine fast	Relay 1 connection fault	Short circuit of walking motor or electromagnetic brake



E[30]	Slow flashing 3 times	Walking motor A-phase NTC fault	Internal malfunction of controller
E[31]	3 slow and 1 fast	Walking motor B-phase NTC fault	Internal malfunction of controller
E[32]	3 slow and 2 fast	Brush disk motor NTC fault	Internal malfunction of controller

6. Disassembly and assembly of controller: 1 Unscrew the battery connection cable and keep the machine powered off; Use the corresponding tool to unscrew the fixing screws of the rotary molding machine head and remove the rotary molding machine head. (The controller is located inside the rotational molding machine head)

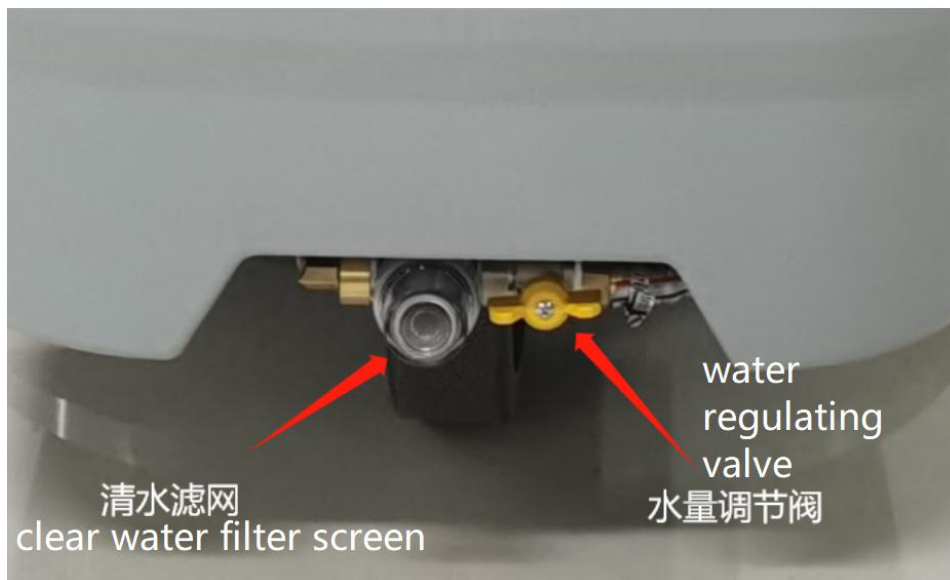


2. Disconnect the control panel cable from the controller connector port, unscrew the positive and negative terminals of the controller, and connect the positive and negative terminals of the walking motor; Remove the fixing screws between the controller and the machine head iron plate, and the controller can be disassembled.

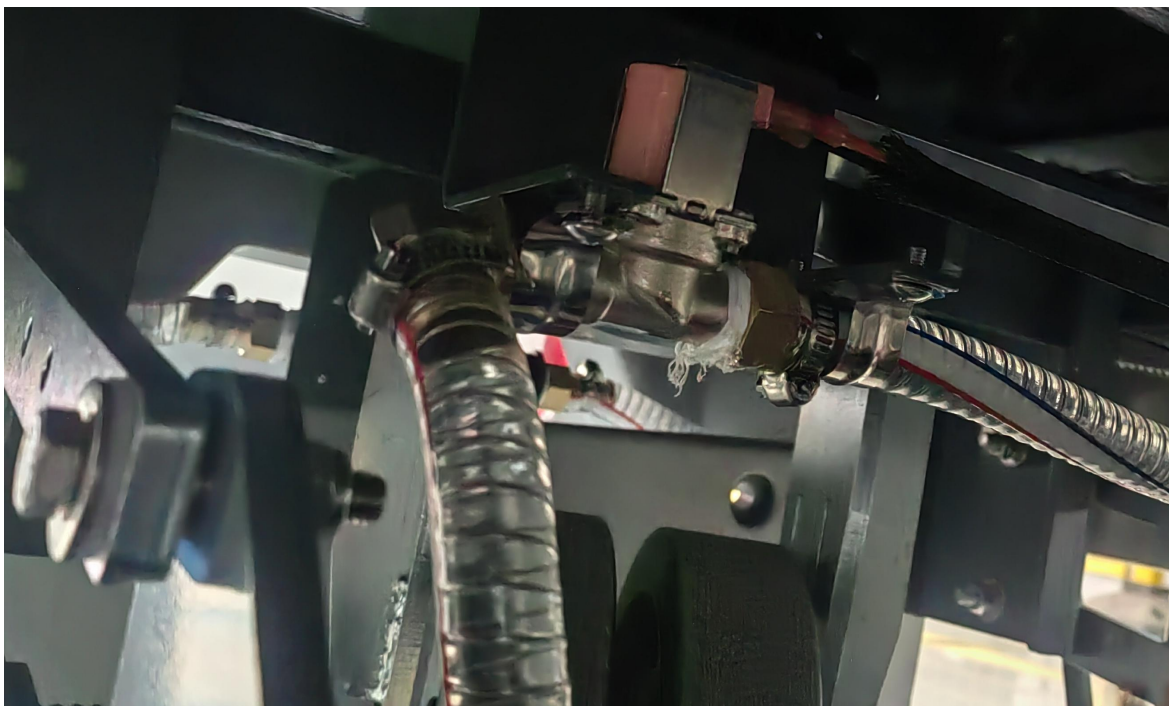
3. Reverse the installation and disassembly process of the controller. (Note: When wiring the controller, the positive and negative wires must not be connected incorrectly)

#### **4.7 Disassembly and assembly of solenoid valve and filter**

1. Disassembly and assembly of filter: The filter is located in front of the front wheels of the machine. After a period of use, if it is found that the machine has a small or no water output, most of the reasons are due to clogging of filter particles and impurities. You need to loosen the transparent cover at the bottom of the filter and remove the internal filter screen for cleaning.



**1. Disassembly and assembly of solenoid valve: The solenoid valve is located directly in front of the brush disc motor and is fixed to the iron plate with nylon zip ties; When replacing, simply cut the tie and pull out the solenoid valve outlet pipe. (Note: During installation, ensure that the clean water pipe is fully connected to the solenoid valve outlet to prevent loosening.)**



## Chapter 5 Analysis Table of Common Problems with Floor scrubbers

problem	reason	processing method
The machine cannot be operated	The battery is out of battery	Battery charge
	Battery malfunction	Replace the battery
	The main fuse is blown	Better fuses
Brushing motor does not work	Brush the disk and lift it off the ground	Lower the flash drive
	Insufficient machine voltage	Timely charging
	Brush disk switch malfunction	Please contact the service center
	Disk flashing controller malfunction	Please contact the service center
fan Not working	The sewage tank is full of water	Timely discharge of sewage
	under voltage	Please charge in a timely manner
	The suction motor is burnt out	Replace the suction motor
	Carbon brush wear	Please contact the service center
Small or no water outflow	The filter screen of the clean water tank is blocked	Clean or replace the drain valve of the clean water tank
	The solenoid valve is damaged	Replace the solenoid valve
Low efficiency in recycling wastewater	Blockage of suction pipe	Timely and regularly clean the suction pipe
	Wear of absorbent rubber strip	Replace the water absorbing rubber strip
	The drain pipe cover is not tightly closed	Cover the sewage pipe tightly
	Fault in the suction motor	Replace the suction motor
	The sealing strip of the sewage tank is damaged	Replace the sealing strip
Reduced working hours	The voltage of two batteries is not equal	Please contact the service center
	Battery charging malfunction	Repair or replace the charger

## Chapter 6 Maintenance

The lifespan and operational safety of the machine must be ensured through proper and routine maintenance. The following is a table of routine maintenance requirements. Under suitable working conditions, the maintenance interval can be changed, which must be determined by the professional responsible for maintenance.

To perform maintenance operations, the machine must be stopped (by removing the start switch key), so please carefully read the safety section of the instruction manual.

### Usage conditions:

- Environmental temperature: -10 °C to 40 °C;
- Relative humidity of the air: 5% to 70%;
- An environment free from conductive dust and explosion hazards;
- An environment that does not contain gases or vapors that corrode metals;
- Indoor use, ventilated, vibration free environment, with a front and rear space of at least 300mm.

### Maintenance schedule:

**Pinsidun Floor Washer Maintenance Schedule**

Maintenance Operations	Daily	Weekly	Monthly	Quarterly	Annually
Water circuit system, check for leaks					
Check water absorption condition and suction head status					
Inspect and clean the brush disc					
Inspect and clean the suction head					
Clean the sewage tank hygienically					
Check the water output and condition of the brush disc					
Check the sealing strip of the sewage tank cover					
Check the suction and discharge pipes, and the suction – drainage status					
Check the wear condition of the brush disc					
Check the wear condition of the suction rubber strip					
Inspect and clean the clean water filter					
Check the air inlet of the sewage tank float ball and the filter element					
Check the status of the drive motor (power, abnormal noise, moisture, etc.)					
Check the status of the suction fan motor (suction force,					

noise, water ingress, etc.)					
Check the tightness of the screws on the brush disc frame and suction head frame					
Maintain movable parts (lubricate the suction frame and brush disc support with grease)					
Check the status of the hub and bearing					
Check the wear of the hub and rubber ring					
Replace vulnerable parts of the frame and bushings					
Check the battery capacity and its changes					
Inspect the electrical system (vehicle connectors, electronic control system)					

**Warranty coverage:**

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