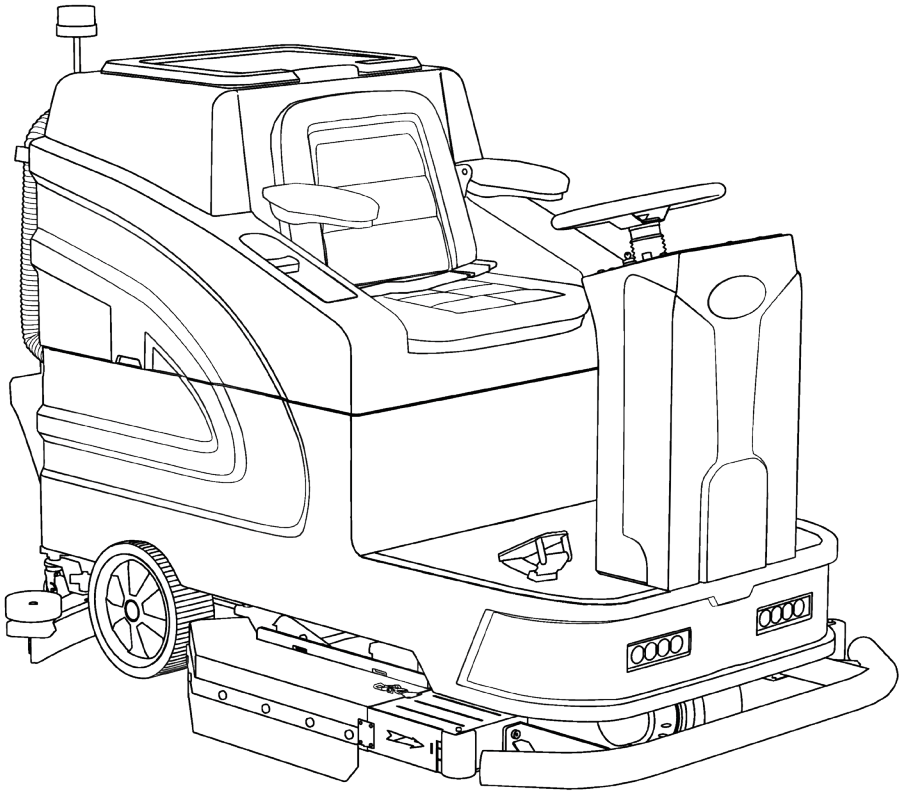
FLOOR SCRUBBER
MODEL: X96



INSTRUCTION MANUAL

▸ INTRODUCTION

Each new machine is supplied with this Operation Manual, containing complete operating instructions and maintenance procedures.

Before performing any operation or maintenance work, you must read this operation manual in full and familiarize yourself with the equipment.

This equipment delivers exceptional floor maintenance and cleaning performance.
To ensure optimal performance at the lowest operating costs, please strictly adhere to the following operating guidelines.

- The equipment must be operated in strict compliance with the operating procedures.
- This equipment must be maintained strictly in accordance with the maintenance instructions.
- This equipment must be maintained using original manufacturer parts or parts of equivalent quality.

PROTECT THE ENVIRONMENT

Please dispose of packaging materials and used components (such as batteries and liquids) in an environmentally friendly manner and comply with local waste disposal regulations.

Please always consider possible recycling.

▸ INTENDED PURPOSE

The X96 is an industrial/commercial ride-on floor scrubber designed for cleaning flat and hard surfaces (e.g., concrete, tiles, stone, and plastic). Typical application scenarios include educational facilities, hospitals/medical institutions, office complexes, and retail centers.

Do not use this machine on soil, grass, artificial turf, or carpeted surfaces.
The machine is intended for indoor use only and is not suitable for public roads.
Do not use the machine for purposes other than those described in this operating manual.

TABLE OF CONTENTS

▸ SAFETY PRECAUTIONS

This manual uses the following hazard symbols to alert operators to potential hazards.

WARNING: Hazards or unsafe operations that may result in serious or fatal injury.

CAUTION: This notice covers the operational procedures that must be strictly followed to ensure safe machine operation.

The following information alerts operators to potential hazards. Always remain vigilant to scenarios where these hazards may occur and thoroughly familiarize yourself with the locations of all safety devices on the machinery. Immediately cease operation if any machine damage or operational malfunction is detected.

WARNING

① Ensure no electrical sparks or open flames are near the battery, as this poses a risk of explosion or fire.

② Flammable liquids may cause explosions or fires.
Never inhale any flammable liquids, flammable gases, solvents, or acidic/alkaline liquids.

③ Flammable materials or reactive metals may cause explosions or fires.
Never use this machine to process such substances.

④ Operation of the equipment by untrained or unauthorized personnel is strictly prohibited.
The use of this equipment by children or individuals with disabilities is not allowed.

⑤ In case of fire, use a dry powder fire extinguisher. Water must not be used under any circumstances.

⑥ The machine's operational atmospheric humidity range is 30% to 95% (non-condensing).

⑦ Operate strictly within the manufacturer-specified climbing angle limit. When working on slopes with minimal gradients and elevations:
- Exercise extreme caution during lateral operation.
- Reverse operation is strictly prohibited.
- Retract brush disc and water absorption rake assemblies when traversing inclines.

⑧ All machine maintenance and repair operations must be performed with the battery terminals disconnected.

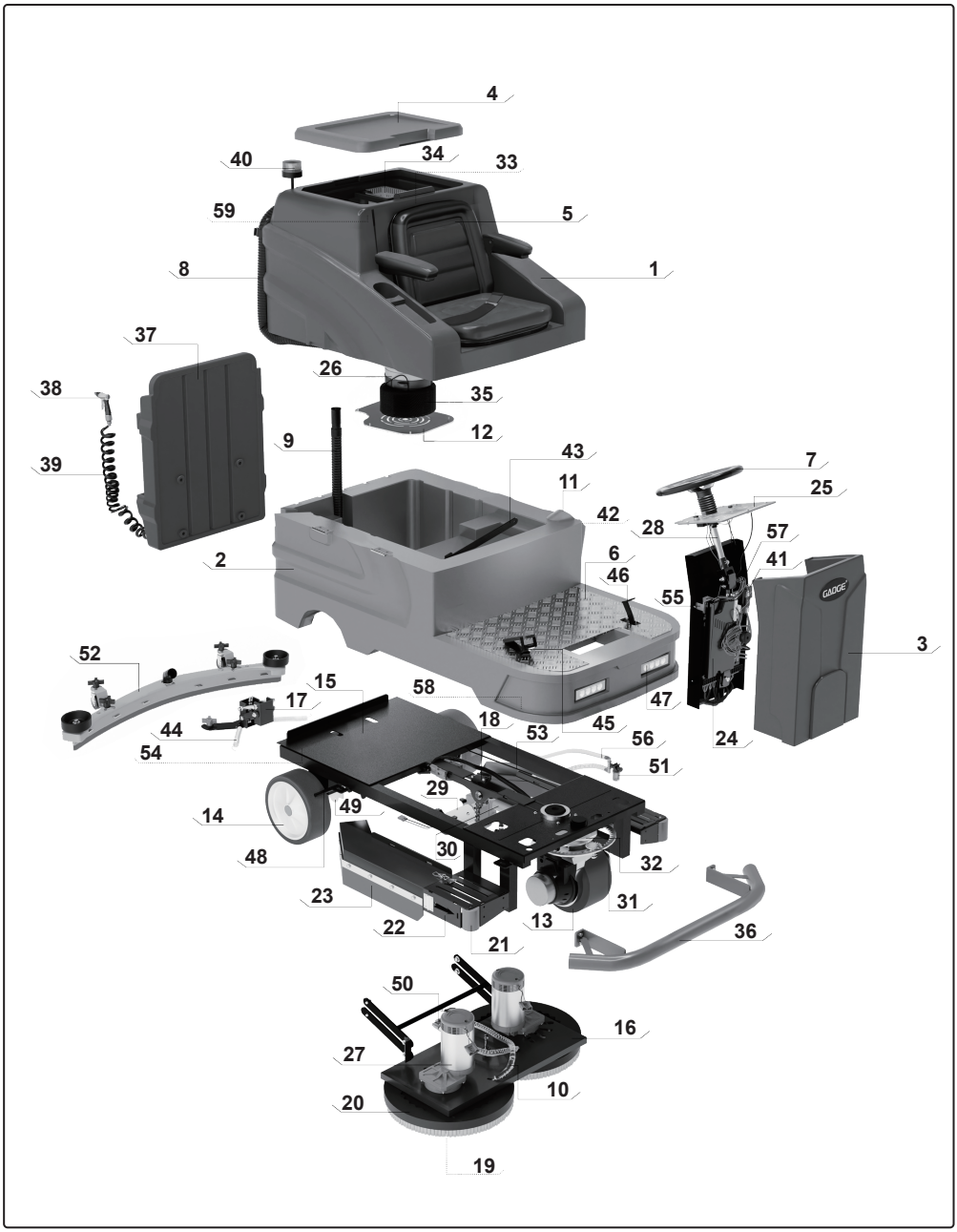
⑨ Operation in special environments (e.g., pharmaceutical industry, hospitals, chemical plants) must strictly comply with all applicable safety standards and regulations.

⑩ Ensure no tools are left above battery terminals to prevent potential short circuits and explosion risks.

⑪ The machine's circuits and motors are water-resistant treated, however, the following cleaning specifications must be strictly observed:
- High-pressure water jet cleaning is strictly prohibited.
- Cleaning must be performed using low-pressure, non-corrosive water.

⑫ The filling funnel must remain installed during water tank refilling operations to prevent foreign object ingress that may damage the pump or clog the hydraulic system.

▸ MACHINE COMPONENTS

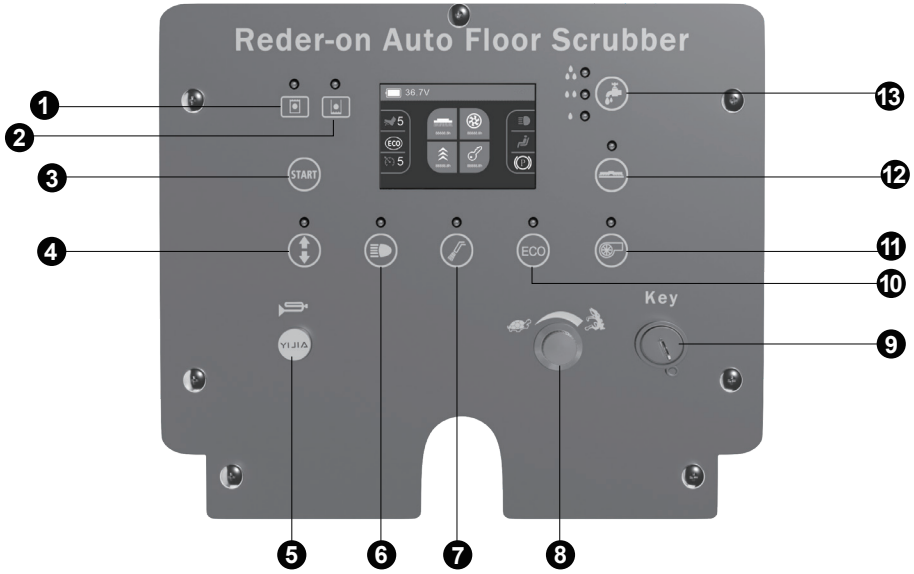


1. Dirty water tank
2. Clean water tank
3. Console housing
4. Sewage tank lid
5. Seat
6. Aluminum step
7. Steering wheel
8. Drain pipe
9. Suction hose
10. Steel wire hose
11. Clean water tank lid
12. Fan cover plate
13. Front drive motor
14. Drive wheel
15. Chassis
16. Motor base
17. Squeegee kit holder
18. Suspended platform
19. Flange
20. Brush
21. Anti-collision wheel
22. Pedal
23. Water shield with rubber seal strip kit
24. Controller
25. Control panel
26. Vacuum motor
27. Brush motor
28. Steering linkage assembly
29. Diaphragm pump
30. Push rod
31. Steering gear
32. Steering fixed bracket
33. Anti-overflow valve
34. Filter basket
35. Sponge
36. Crash barrier
37. Backplate
38. Water gun
39. Spiral tube
40. Warning light
41. Socket
42. Liquid level tube
43. Pull rod and bracket assembly
44. Tension spring
45. Accelerator pedal
46. Brake pedal
47. Lighting lamp
48. Brake lever
49. Rear axle
50. Solenoid valve
51. Filter, tee, and elbow
52. Squeegee
53. Steel wire rope
54. Rotating arm + ship block
55. Conversion module
56. Pipe
57. Relay
58. Clean water sensor
59. Wastewater tank sensor

▸ OPERATING CONTROLS

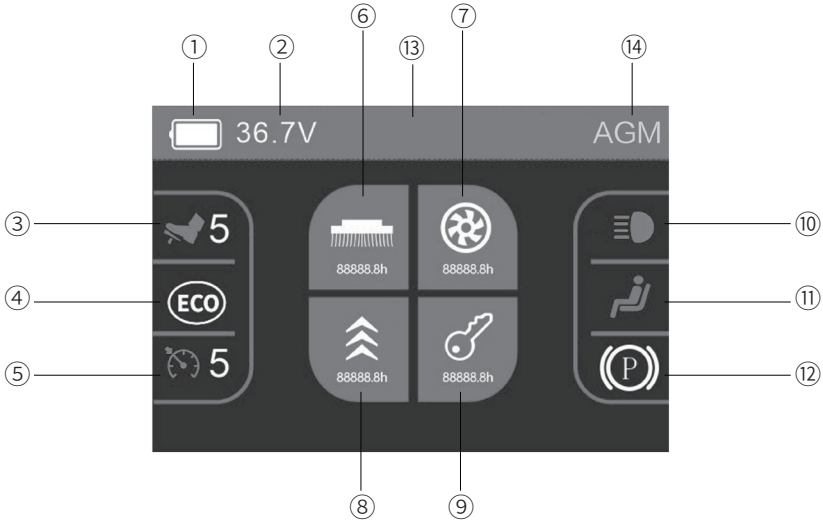
Smart control panel, featuring an added Eco-mode to enhance environmental friendliness and energy efficiency. Speed adjustment switch with an adjustable range of 1-12 km/h.

CONTROL PANEL



1. Dirty water tank full light
2. Solution tank light
3. Start
4. Forward and backward
5. Trumpets
6. LED light
7. Water gun
8. Speed adjustment
9. Key switch
10. Energy-saving mode
11. Squeegee
12. Brush
13. Water regulation

DISPLAY SCREEN FUNCTION DESCRIPTION



①	Battery level.
②	Battery voltage.
③	Throttle speed levels: 0-9.
④	ECO: When entering ECO mode, the ECO icon changes from white to green.
⑤	Speed-limiting potentiometer settings: 1-8 gears.
⑥	Brush motor operating status and runtime.
⑦	Suction motor operating status and runtime.
⑧	Walking motor operating status and indicators: Forward: The direction arrow (↑) is animated, and the button indicator remains steadily lit. Reverse: The direction arrow (↓) is animated, and the button indicator blinks. Neutral: The direction arrow (↑) is static, and the button indicator is off.
⑨	Startup time.
⑩	Headlights: The headlight icon changes from white to yellow when turned on.
⑪	Seat switch status: The seat switch icon turns red when active and white when inactive.
⑫	Brake status: The brake indicator displays red (with a "P" in the center) when the brake is engaged, and white (without the "P") when disengaged.
⑬	Fault code display: When a fault occurs, the corresponding fault code will appear in this area. Refer to the fault code manual for detailed descriptions of each code.
⑭	Battery type.

▸ MAIN STRUCTURE

DIRTY WATER TANK

The high-capacity dirty water tank design ensures operational efficiency, while the filtration system coupled with an electronic sewage sensing device effectively safeguards the air blower.

Before use, check the following:

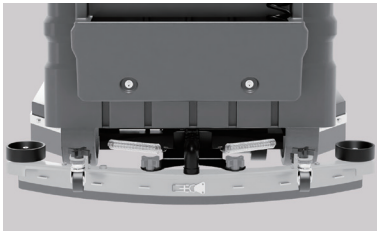
1. Whether the dirty water tank lid is securely closed.
2. Whether the cleaning access cover at the bottom of the dirty water tank is properly closed and tightened.
3. Whether there is air leakage in the suction hose.

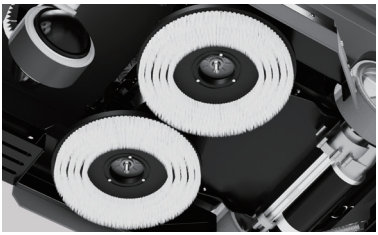
CLEAN WATER TANK

The water tank features a sandwich-structured design with enlarged and thickened dimensions. Its hollow inner wall allows clean water to be filled, saving space and enhancing equipment efficiency.

SQUEEGEE

The cast aluminum water absorption squeegee is robust and durable, while the natural rubber strip offers wear-resistant longevity. During machine operation, the scraping rubber of the suction squeegee maintains a slight rearward tilt at a specific angle relative to the ground surface.The enlarged and widened design doubles the cleaning efficiency.



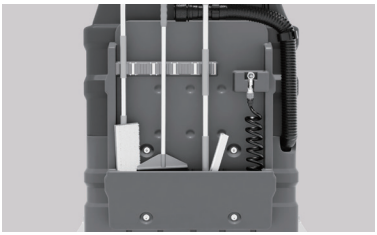


BRUSH

Wider dual brushes, paired with dual motors, significantly enhance efficiency.
Check the height of the brush plate of the floor scrubber every week. If the brush is worn out or the bristles are twisted, it is bestto reassemble them to avoid the different inclinations of the bristles causing the brush motor to overload and vibrate too much.

ERGONOMIC CHAIR

The ergonomic seat ensures enhanced comfort and incorporates a safety interlock system. This system is activated only when the operator is seated, enabling the machine to operate exclusively under safe conditions and providing additional safety assurance during use.



MULTI-FUNCTIONAL TOOL RACK

Equipped with a versatile tool rack that organizes various manual cleaning tools, effectively handling complex cleaning environments.

CRASH BARRIER

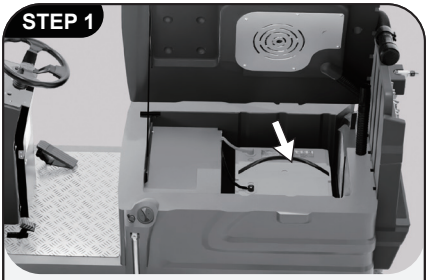
The crash barrier employs a triangular truss structure design, delivering impact-resistant and corrosion-resistant properties with significantly enhanced safety and durability.

WATER GUN

The water gun is equipped with a 2.8 bar pressure pump from the renowned marine pump brand Seaflo, capable of cleaning corners and tight spots, and is simple and easy to use.

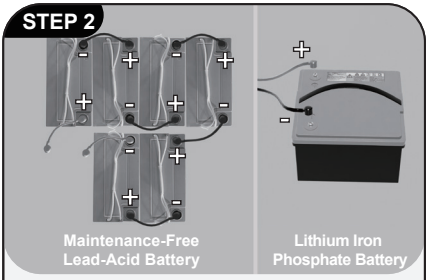
▸ INSTALLATION AND OPERATION

STEP 1



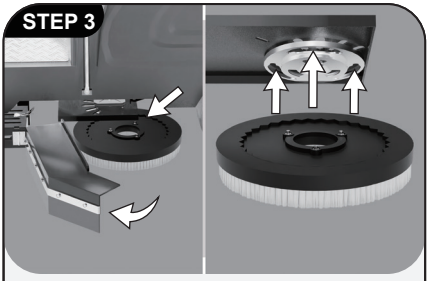
Open the dirty water tank cover and put in the battery.

STEP 2



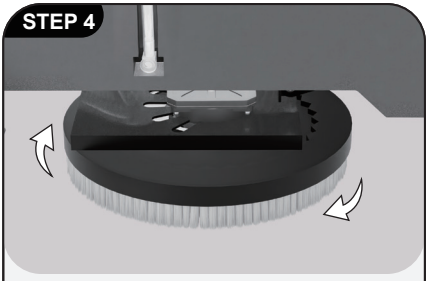
Connect the battery's positive and negative terminals with wires as shown in the picture, and then connect them to the device.

STEP 3



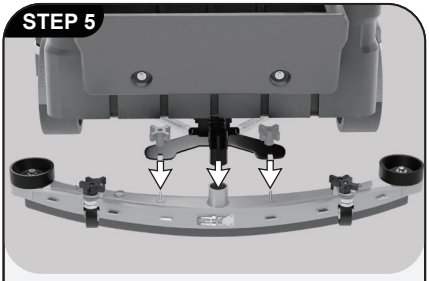
Open the water shield, place the brush plate into position, aligning the three screws on the brush plate with the three receiving clips above.

STEP 4



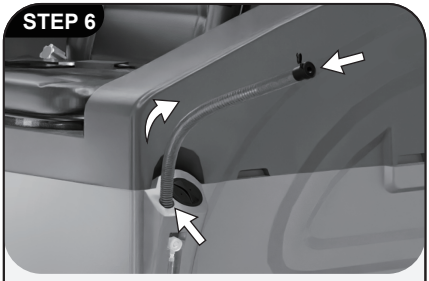
Rotate the brush plate clockwise to securely engage it with the upper clips. Installation complete.

STEP 5



Install the squeegee assembly and tighten the knob securely. Connect the vacuum hose to the squeegee assembly, inspect the rubber blade, and make necessary adjustments.

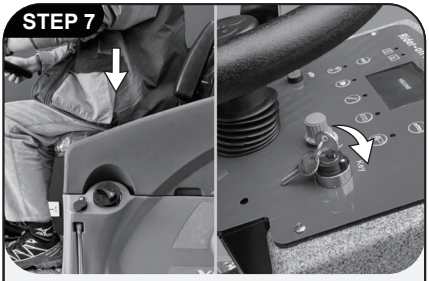
STEP 6



Pull out the water inlet hose, open the lid, and align it with the faucet to fill water.

Note:If cleaning agent is added, an antifoaming agent must be simultaneously added to the dirty water tank to prevent motor damage.

STEP 7



First, sit on the sensor seat, then turn on the key to light up the screen.

STEP 8

① Click the Start button to activate Intelligent Startup.
② Click the water volume adjustment button to choose the appropriate water level.
③ Click the direction button to set the travel direction.

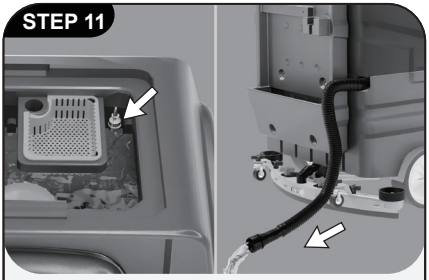
STEP 9

Step on the accelerator pedal to begin efficient operation.

STEP 10

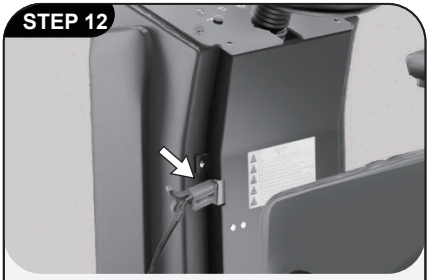
After cleaning is completed, click the Start button again, then turn off the key switch.

STEP 11



When the dirty water reaches full capacity, the sensor will alarm. Promptly detach the dirty water hose to empty the dirty water.

STEP 12



Recharge promptly after use. If the battery level on the panel falls to ≤26% (indicator turns red), charge immediately.

▸ OPERATIONAL PRECAUTIONS

PRE-OPERATION CHECK

- Remove dust from the floor.
- Verify the charge level indicators on the battery gauge. (refer to the battery gauge)
- Inspect wear condition of brushes/cleaning pads.
- Check the wear of the squeegee rubber blade and adjust the angle appropriately.
- Check the wear on the brush head skirt.
- Ensure the wastewater tank is empty and that a clean floating filter ball cage has been installed.

NOTE: Before starting the machine, ensure all safety devices are properly positioned and functioning correctly.

DURING MACHINE OPERATION

- Ensure a 5 cm overlap between adjacent cleaning paths.
- Maintain continuous machine travel to prevent floor damage.
- If streaking occurs after using the squeegee, clean the rubber blade with a lint-free cloth to remove debris. Pre-sweep surfaces to eliminate potential contaminants that cause streaks.
- Do not operate the machine on slopes exceeding a 5% (3°) incline.
- When using detergent for cleaning, add defoamer solution to the wastewater tank to suppress foam formation.

WARNING: Prevent foam ingress into the filter assembly to avoid suction motor damage. Foam accumulation may disable the safety switch mechanism.

- When cleaning heavily soiled areas, first raise the squeegee to begin cleaning and allow the solution to soak for 3-5 minutes. Then lower the squeegee and repeat the cleaning process.
- Replace the scouring pad as needed based on the cleaning scenario.
- Monitor the battery power consumption (refer to the battery gauge).
- Check the remaining liquid level through the clean water tank level gauge. The traditional floor cleaning method consumes approximately 10 liters every 10 minutes.
- When the solution in the clean water tank is depleted, empty the waste water tank first before refilling with fresh solution.
- When the operator leaves the machine, park it on level ground and remove the key.
- After cleaning is completed, perform the daily maintenance procedures.

NOTE: It is recommended to use a cleaning speed of 45-60 meters per minute.

▸ BRUSHES AND SCOURING PADS

To ensure optimal performance, always use the correct brush type for cleaning tasks. Recommendations for using brushes and scouring pads are as follows:

White soft nylon brush
Recommended for cleaning coated floors without damaging the surface.

White polishing pad
Recommended for maintaining high-gloss or polished floors.

Red buffer pad
Recommended for gently scrubbing away light dirt without damaging the floor.

Black gravity scrub pad
Recommended for aggressively removing heavy coatings or substrates, or for ultra-intensive cleaning.

INSTALL BRUSH AND SCRUB PAD

1. Park the machine on level ground and remove the key.
2. First place the scrub pad on the needle adapter, then install the drive plate. Secure the scrub pad by tightening the central lock.
3. Align the needle adapter/brush mounting stud with the motor drive plate latch, then press the brush motor switch.
4. To remove the needle adapter and brush, step on the brush head lifting pedal to raise the brush head off the ground, then press the brush motor switch.
5. Step on the brush head lifting pedal to raise the brush head off the ground.

NOTE: For instructions on using brushes and scrub pads, refer to the usage recommendations for brushes and scrub pads provided above.

▸ DRAIN THE WATER TANK

Drain and clean the dirty water tank after each use.
Regularly clean the clean water tank to remove any corrosion.

Move the machine to the drainage area, turn off the power key, and drain the water according to the following instructions:

1. Rotate the drain pipe cap of the dirty water tank counterclockwise and remove it.
2. Open the dirty water tank cover and rinse the tank.
3. Remove and rinse the floating filter screen located inside the dirty water tank.

NOTE: For safety reasons, before leaving the machine to drain, please ensure that the machine is parked on level ground, turned off, and the key is removed.

▸ BATTERY INSTALLATION

WARNING: When installing the battery, ensure the machine key is in the OFF position and remove the key to prevent electric shock hazards!

FOR SAFETY REASONS: Wear protective gloves and eye protection when servicing the machine or handling the battery and battery terminals. Avoid contact with battery acid.

- Park the machine on level ground, shut down the machine, and remove the key.
- Lift the wastewater tank and place it into the battery compartment. Before connecting the battery, ensure that the electrodes and terminals are clean. Use an electrode cleaning wave and a soft brush as needed.

NOTE: Do not drop the battery into the battery compartment, as this may cause damage to both the battery and the machine.

- Connect the cables correctly according to the battery electrodes.

NOTE: Apply a thin layer of non-metallic grease or protective spray to the connected terminals to prevent battery corrosion.

- After the battery is securely installed, check the charge level on the battery indicator. Recharge the battery as needed.

▸ BATTERY CHARGING

WARNING

To extend the battery life and ensure the machine's optimal performance, the battery must be charged only after the machine has been used for at least 30 minutes. Do not leave the battery in an uncharged state for extended periods. The following charging instructions apply to the charger provided with this machine.

NOTE:The battery's lifespan is limited by the number of charging cycles. To avoid permanent damage, ensure the battery is never fully discharged.

BATTERY TYPE

Simultaneously press and hold the water volume and ECO buttons to power on the device. Then press the ECO button to select the battery type. After selection is complete, power off and restart the device to finalize the setup.

When the battery level on the panel reaches ⩾84%, it shows full bars; when the level drops to ⩽26%, the battery indicator turns red; at ⩽13%, the battery display shows zero bars.Recharge immediately when the indicator turns red.

AGM: Voltage range 32.5V~37.5V, low voltage protection at 32.5V, high voltage protection at 45V.
LFP: Voltage range 33V~39V, low voltage protection at 33V, high voltage protection at 45V.
LIT: Voltage range 33V~39V, low voltage protection at 33V, high voltage protection at 45V.

CHARGE THE BATTERY USING AN EXTERNAL CHARGER

IMPORTANT NOTE: Before charging, ensure the charger settings match the battery type.

1. Move the machine to a well-ventilated area.
2. Place the machine on a flat, dry surface and turn it off.
3. Before charging, check the electrolyte level in each cell of the battery.

FOR SAFETY REASONS: When servicing the machine, wear protective gloves and eye protection when handling the battery and battery terminals. Avoid contact with battery acid.

4. When charging, open the side of the wastewater tank to ensure ventilation. (As shown in the figure)

WARNING: The battery releases hydrogen gas, which poses a risk of explosion or fire. Keep away from electrical sparks or open flames near the battery. Keep the battery compartment open during charging.

5. Plug the charger into the machine's charging port.
6. Plug the battery charger into the power outlet.
7. The charger will automatically shut off after the battery is fully charged.

NOTE: The machine cannot be operated when connected to the charger.

WARNING: Do not disconnect the charger's DC cable from the machine's charging port while the charger is operating, as this may cause an arc discharge. If it is necessary to disconnect the charger during charging, first unplug the power cord from the outlet.

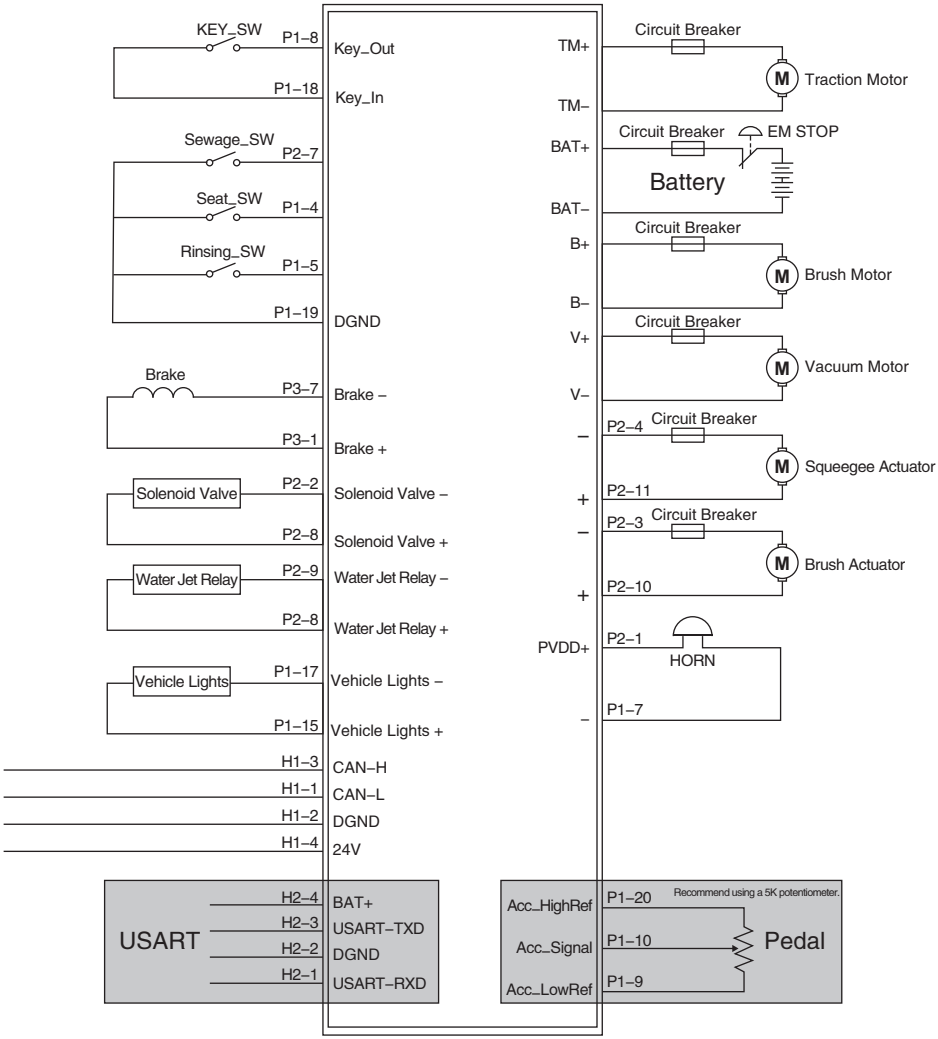
8. After charging is complete, check the electrolyte level again.

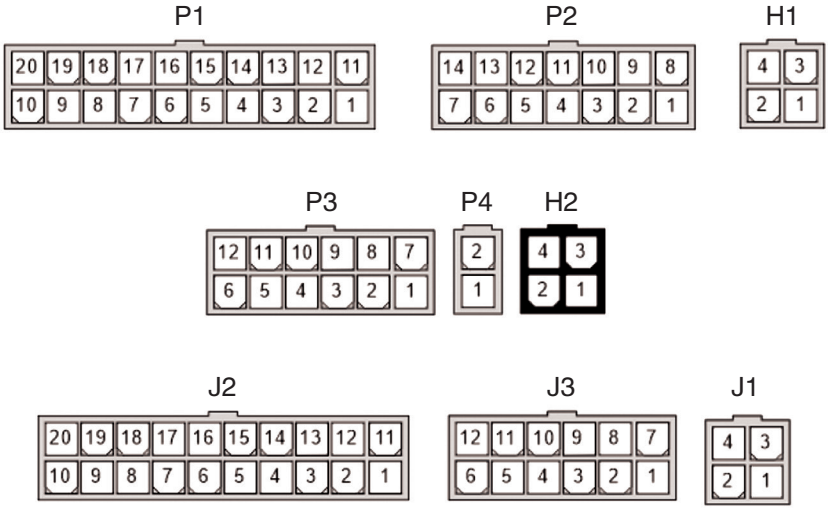
WARNING

Please select the appropriate charger based on the battery type. Before charging, ensure that the charger settings match the battery type.
This device must be charged using the original manufacturer's charger or a charger with equivalent quality specifications.

▸CIRCUIT DIAGRAM

ELECTRICAL SCHEMATIC—X96





▸ TROUBLESHOOTING GUIDE

When a fault is detected in the drive system, operation should be halted. Please refer to the table below to determine the cause of the fault.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[01]	1 quick flash	Precharge fault 1.	1.Brake output short to ground. 2.Controller travel motor control MOS damaged or brake control MOS damaged. Troubleshooting method: Disconnect the brake from the controller. If the fault disappears, check for a short to ground in the brake circuit. If the fault persists, the issue is internal to the controller.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[02]	2 quick flashes	Precharge fault 2.	1.Short to ground in output points other than the brake (P1-15/P2-1/P2-8/P3-4/P3-5) 2.Short to ground at the motor positive terminal in motors other than the travel motor. (Shuapan/Xifeng/P2-3/P2-10/P2-4/P2-11/ P3-4/P3-10/P3-5/P3-11/P3-6/P3-12) 3. Controller damaged. Troubleshooting method: Disconnect connectors P1, P2, and P3 from the controller.Use a jumper wire to short pins P1-8 and P1-18.Power on the controller and measure the voltage between P1-15 and B-.,If the voltage is greater than (P1-18 voltage – 5V):A short to ground exists in the output points of P1, P2, or P3. Inspect the following points individually:P1-7, P1-15, P1-17, P2-2, P2-9, P2-1, P2-8, P3-4, P3-10, P3-5, P3-11. If the voltage is less than (P1-18 voltage minus 5V):Disconnect the brush motor and suction motor one by one. If the fault disappears: Check for a short to ground in the brush motor or suction motor. If the fault persists: The issue is an internal controller malfunction.
E[03]	3 quick flashes	PVDD1 overvoltage fault.	For 24V systems: P4-1 voltage exceeds 34V. For 36V systems: P4-1 voltage exceeds 45V.
E[04]	4 quick flashes	PVDD1 undervoltage fault.	For 24V systems: P4-1 voltage is below 12V. For 36V systems: P4-1 voltage is below 12V.
E[05]	5 quick flashes	12V-Front overvoltage fault.	Internal controller fault.
E[06]	6 quick flashes	12V-Front undervoltage fault.	Internal controller fault.
E[07]	7 quick flashes	12V-CPU overvoltage fault.	Internal controller fault.
E[08]	8 quick flashes	12V-CPU undervoltage fault.	Internal controller fault.
E[09]	9 quick flashes	CAN overvoltage fault.	Internal controller fault.
E[0A]	10 quick flashes	CAN undervoltage fault.	Internal controller fault.
E[10]	Slow flash once	PVDD2 overvoltage fault.	For a 24V system, BM+ voltage exceeds 34V. For a 36V system, BM+ voltage exceeds 45V.
E[11]	1 Slow, 1 Fast	PVDD2 undervoltage fault.	For a 24V system, BM+ voltage is below 12V. For a 36V system, BM+ voltage is below 12V.
E[12]	1 Slow, 2 Fast	Key switch overvoltage fault.	For a 24V system, P1-18 voltage exceeds 34V. For a 36V system, P1-18 voltage exceeds 45V.
E[13]	1 Slow, 3 Fast	Key switch undervoltage fault.	For a 24V system, P1-18 voltage is below 12V. For a 36V system, P1-18 voltage is below 12V.
E[14]	1 Slow, 4 Fast	Battery undervoltage fault.	24V system, BAT+ voltage below 12V. 36V system, BAT+ voltage below 12V.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[15]	1 Slow, 5 Fast	Battery overvoltage fault.	For 24V system: BAT+ voltage exceeds 34V. For 36V system: BAT+ voltage exceeds 45V.
E[16]	1 Slow, 6 Fast	Battery voltage critically low fault.	For 24V system: BAT+ voltage below 12V. For 36V system: BAT+ voltage below 12V.
E[17]	1 Slow, 7 Fast	Battery voltage critically high fault.	For 24V system: BAT+ voltage below 36V. For 36V system: BAT+ voltage below 47V.
E[18]	1 Slow, 8 Fast	12V drive voltage overvoltage fault.	Internal controller fault.
E[19]	1 Slow, 9 Fast	12V drive voltage undervoltage fault.	Internal controller fault.
E[1A]	1 Slow, 10 Fast	12V output overvoltage fault.	Internal controller fault.
E[20]	2 Slow Flashes	12V output undervoltage fault.	Internal controller fault.
E[21]	2 Slow, 1 Fast	VQEP1 overvoltage fault.	Internal controller fault.
E[22]	2 Slow, 2 Fast	VQEP1 undervoltage fault.	Internal controller fault.
E[23]	2 Slow, 3 Fast	5V output overvoltage fault.	Internal controller fault.
E[24]	2 Slow, 4 Fast	5V output undervoltage fault.	Internal controller fault.
E[25]	2 Slow, 5 Fast	UART overvoltage fault.	Internal controller fault.
E[26]	2 Slow, 6 Fast	UART undervoltage fault.	Internal controller fault.
E[27]	2 Slow, 7 Fast	VQEP2 overvoltage fault.	Internal controller fault.
E[28]	2 Slow, 8 Fast	VQEP2 undervoltage fault.	Internal controller fault.
E[29]	2 Slow, 9 Fast	Relay 1 connection fault.	Travel motor control relay disconnected – investigate in conjunction with other faults.
E[2A]	2 Slow, 10 Fast	Relay 2 connection fault.	Floor washing control relay disconnected – investigate in conjunction with other faults.
E[30]	Slow flash 3 times	Travel motor phase A NTC fault.	Internal controller fault.
E[31]	3 Slow, 1 Fast	Travel motor phase B NTC fault.	Internal controller fault.
E[32]	3 Slow, 2 Fast	Brush motor NTC fault.	Internal controller fault.
E[33]	3 Slow, 3 Fast	Suction motor NTC fault.	Internal controller fault.
E[34]	3 Slow, 4 Fast	Travel motor A control over-temperature fault.	Travel motor A control over-temperature.
E[35]	3 Slow, 5 Fast	Travel motor A control temperature limit exceeded fault.	Travel motor A control temperature limit exceeded.
E[36]	3 Slow, 6 Fast	Travel motor B control over-temperature fault.	Travel motor B control over-temperature.
E[37]	3 Slow, 7 Fast	Travel motor B control temperature limit exceeded fault.	Travel motor B control temperature limit exceeded.
E[38]	3 Slow, 8 Fast	Brush motor control over-temperature fault.	Brush motor control over-temperature.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[39]	3 Slow, 9 Fast	Brush motor control temperature limit exceeded faul.	Brush motor control temperature limit exceeded.
E[3A]	3 Slow, 10 Fast	Suction motor control over-temperature fault.	Suction motor control over-temperature.
E[40]	Slow flash 4 times	Suction motor control temperature limit exceeded fault.	Suction motor control temperature limit exceeded.
E[41]	4 Slow, 1 Fast	Travel motor phase A MOS voltage high fault.	Travel motor Phase A voltage too high. Disconnect the motor wiring from the controller and restart. If the fault persists, it indicates an internal controller failure; If resolved, check for short circuits between the motor wiring and battery+ terminal.
E[42]	4 Slow, 2 Fast	Travel motor phase A MOS voltage low fault.	Travel motor Phase A voltage too low. Disconnect the motor wiring from the controller and restart. If the fault persists, it indicates an internal controller failure; If resolved, check for short circuits between the motor wiring and battery+ terminal.
E[43]	4 Slow, 3 Fast	Travel motor phase B MOS voltage high fault.	Travel motor Phase B voltage too high. Disconnect the motor wiring from the controller and restart. If the fault persists, it indicates an internal controller failure; If resolved, check for short circuits between the motor wiring and battery+ terminal.
E[44]	4 Slow, 4 Fast	Travel motor phase B MOS voltage low fault.	Travel motor Phase B voltage too low. Disconnect the motor wiring from the controller and restart. If the fault persists, it indicates an internal controller failure; If resolved, check for short circuits between the motor wiring and battery+ terminal.
E[45]	4 Slow, 5 Fast	Brush motor MOS voltage high fault.	/
E[46]	4 Slow, 6 Fast	Brush motor MOS voltage low fault.	Brush motor voltage too low. Troubleshooting:Remove the brush motor from the controller and restart. If the fault disappears, check for short circuits to ground in the brush motor; If the fault persists, it indicates an internal controller failure.
E[47]	4 Slow, 7 Fast	Suction motor MOS voltage high fault.	/
E[48]	4 Slow, 8 Fast	Suction motor MOS voltage low fault.	Suction VM voltage too low. Troubleshooting:Remove the suction motor from the controller and restart. If the fault disappears, check for short circuits to ground in the suction motor; If the fault persists, it indicates an internal controller failure.
E[49]	4 Slow, 9 Fast	Brush lift MOS-A voltage high fault.	Troubleshooting:Disconnect the brush disk lifting motor (P2-3/P2-10) from the controller.If the fault disappears, check whether the motor is short-circuited to B+/PVDD2.If the fault persists, the issue originates from an internal fault within the controller.
E[4A]	4 Slow, 10 Fast	Brush lift MOS-A voltage low fault.	Troubleshooting:Disconnect the brush disk lifting motor (P2-3/P2-10) from the controller.If the fault disappears, check whether the motor is short-circuited to ground.If the fault persists, the issue originates from an internal fault within the controller.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[50]	Slow flash 5 times	Brush lift MOS-B voltage high fault.	Troubleshooting:Remove the brush disk lifting motor (P2-3/P2-10) from the controller. If the fault disappears, check whether the motor is shorted to B+/PVDD2. If the fault persists, it indicates an internal fault within the controller.
E[51]	5 Slow, 1 Fast	Brush lift MOS-B voltage low fault.	Troubleshooting:Remove the brush disk lifting motor (P2-3/P2-10) from the controller. If the fault disappears, check whether the motor is shorted to ground. If the fault persists, it indicates an internal fault within the controller.
E[52]	5 Slow, 2 Fast	Squeegee lift MOS-A voltage high fault.	Troubleshooting:Remove the water squeegee lifting motor (P2-4/P2-11) from the controller. If the fault disappears, check whether the motor is shorted to B+/PVDD2. If the fault persists, it indicates an internal fault in the controller.
E[53]	5 Slow, 3 Fast	Squeegee lift MOS-A voltage low fault.	Troubleshooting:Remove the water squeegee lifting motor (P2-4/P2-11) from the controller. If the fault disappears, check whether the motor is shorted to ground. If the fault persists, it indicates an internal fault within the controller.
E[54]	5 Slow, 4 Fast	Squeegee lift MOS-B voltage high fault.	Troubleshooting:Disconnect the water rake lifting motor (P2-4/P2-11) from the controller. If the fault disappears, check whether the motor is short-circuited to B+/PVDD2. If the fault persists, it indicates an internal fault in the controller.
E[55]	5 Slow, 5 Fast	Squeegee lift MOS-B voltage low fault	Troubleshooting:Disconnect the water rake lifting motor (P2-4/P2-11) from the controller.If the fault disappears, check for a short circuit between the motor and ground (B+/PVDD2).If the fault persists, the issue originates from an internal fault within the controller.
E[63]	6 Slow, 3 Fast	Travel motor open circuit fault.	Troubleshooting: 1.Check for an open circuit in the travel motor. Remove the motor from the controller and measure continuity between the two motor wires. 2.Verify the wiring connections between the travel motor and the controller are correct.
E[64]	6 Slow, 4 Fast	Travel motor MOS-A short circuit fault.	The traveling motor is short-circuited. Restart and check if the fault disappears. If it occurs every time it runs, check whether the motor is damaged or there is an external short circuit.
E[65]	6 Slow, 5 Fast	Travel motor MOS-B short circuit fault.	The traveling motor is short-circuited. Restart and check if the fault disappears. If it occurs every time it runs, check whether the motor is damaged or there is an external short circuit.
E[66]	6 Slow, 6 Fast	Travel motor overload fault.	/

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[67]	6 Slow, 7 Fast	Brush disk motor open circuit fault.	Troubleshooting: 1.Check for an open circuit in the brush disk motor. Disconnect the brush disk motor from the controller and measure whether there is continuity between the two motor wires. 2.Verify that the wiring between the brush disk motor and the controller is correct.
E[68]	6 Slow, 8 Fast	Brush disk motor short circuit fault.	The brush disk motor is short-circuited. Restart and check if the fault disappears. If it occurs every time it runs, check whether the motor is damaged or there is an external short circuit.
E[69]	6 Slow, 9 Fast	Brush disk motor overload fault.	The operating current and duration of the brush disk motor exceed the protective current and duration set by the parameters; check for locked rotor or other unexpected conditions.
E[6A]	6 Slow, 10 Fast	Suction motor open circuit fault.	Troubleshooting: 1.Check for an open circuit in the suction motor. Disconnect the suction motor from the controller and measure whether there is continuity between the two motor wires. 2.Verify that the wiring between the suction motor and the controller is correct.
E[70]	Slow flash 7 times	Suction motor short circuit fault.	The suction motor is short-circuited. Restart and check if the fault disappears. If it occurs every time it runs, check whether the motor is damaged or there is an external short circuit.
E[71]	7 Slow, 1 Fast	Suction motor overload fault.	The operating current and duration of the suction motor have exceeded the preset protective levels; check for a locked rotor or other unexpected conditions.
E[72]	7 Slow, 2 Fast	Brush disk lifting motor open circuit fault.	Troubleshooting: 1.Check for an open circuit in the brush disk lifting motor. Disconnect the brush disk lifting motor from the controller and measure whether there is continuity between the two motor wires. 2.Verify that the wiring between the brush disk lifting motor and the controller is correct.
E[73]	7 Slow, 3 Fast	Brush disk lifting motor short circuit fault.	The brush disk lifting motor is short-circuited. Restart and check if the fault disappears. If it occurs every time it runs, check whether the motor is damaged or there is an external short circuit.
E[74]	7 Slow, 4 Fast	Brush disk lifting motor overload fault.	The operating current and duration of the brush disk lifting motor have exceeded the preset protective levels; check for a locked rotor or other unexpected conditions.
E[75]	7 Slow, 5 Fast	Water squeegee lifting motor open circuit fault.	Troubleshooting: 1.Check for an open circuit in the water squeegee lifting motor. Disconnect the brush disk lifting motor from the controller and measure whether there is continuity between the two motor wires. 2.Verify that the wiring between the water squeegee lifting motor and the controller is correct.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[76]	7 Slow, 6 Fast	Water squeegee lifting motor short circuit fault.	The water squeegee lifting motor is short-circuited. Restart and check if the fault disappears. If it occurs every time it runs, check whether the motor is damaged or there is an external short circuit.
E[77]	7 Slow, 7 Fast	Water squeegee lifting motor overload fault.	The operating current and duration of the water squeegee lifting motor have exceeded the parameter-set protective levels; check for a locked rotor or other unexpected conditions.
E[86]	8 Slow, 6 Fast	Output point 1 open circuit fault.	Unused
E[87]	8 Slow, 7 Fast	Output point 1 short circuit fault.	Unused
E[88]	8 Slow, 8 Fast	Output point 2 open circuit fault.	Speaker at output point 2 is not properly connected. Troubleshooting: 1.Remove the speaker and measure whether it has an open circuit; 2.Check if the wiring is correct and inspect for any broken wires or disconnections in the intermediate sections.
E[89]	8 Slow, 9 Fast	Output point 2 short circuit fault.	Short circuit in the speaker connection at output point 2. Troubleshooting: 1.Check if there is a short circuit between the two wires of the speaker (resistance should be very low); 2.Inspect whether the speaker is shorted to B- or B+.
E[8A]	8 Slow, 10 Fast	Output point 3 open circuit fault.	Unused
E[90]	Slow flash 9 times	Output point 3 short circuit fault.	Unused
E[91]	9 Slow, 1 Fast	Output point 4 open circuit fault.	Output point 4 is not properly connected to the solenoid valve. Troubleshooting: 1.Remove the solenoid valve and measure whether it is open-circuited or not. 2.Check if the wiring is correct and inspect for any broken wires in the connection.
E[92]	9 Slow, 2 Fast	Output point 4 short circuit fault.	Output point 4 solenoid valve connection short circuit. Troubleshooting: 1.Measure resistance between the two wires of the solenoid valve to check for short circuit (abnormally low resistance). 2.Verify whether the solenoid valve is shorted to B- or B+.
E[93]	9 Slow, 3 Fast	Output point 5 open circuit fault.	Unused
E[94]	9 Slow, 4 Fast	Output point 5 short circuit fault.	Unused
E[95]	9 Slow, 5 Fast	Output point 6 open circuit fault.	Output point 6 electromagnetic brake Improper connection. Troubleshooting: 1.Remove the electromagnetic brake and measure for open-circuit condition. 2.Check wiring connections for correctness and inspect for broken wires in the circuit.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[96]	9 Slow, 6 Fast	Output point 6 short circuit fault.	Output point 6 electromagnetic brake short circuit detected. Troubleshooting: 1.Measure resistance between its two wires to check for short circuit (abnormally low resistance). 2.Verify whether the electromagnetic brake is shorted to B- or B+ if present.
E[97]	9 Slow, 7 Fast	CAN offline fault.	The CAN connection between the controller and LCD is disconnected. Check whether the CAN communication lines are properly connected.
E[98]	9 Slow, 8 Fast	UART offline fault.	/
E[99]	9 Slow, 9 Fast	Throttle connection fault.	Verify whether the throttle input voltage is within the range configured in the controller. Note: • For 24V systems: 0~5.4V • For 36V systems: 0.2~4.6V
E[A0]	Slow flash 10 times	Throttle speed limiter connection fault.	Verify that the throttle limit potentiometer is properly connected.
E[A1]	10 Slow, 1 Fast	High pedal prohibition fault.	High pedal Inhibit - vehicle enters travel-ready state upon power-up. Inspect direction gear and throttle input; verify throttle input voltage is within controller-configured range. (24V systems: 0-5.4V 36V systems: 0.2-4.6V)
E[A2]	10 Slow, 2 Fast	Brush disk function low voltage fault.	Battery voltage has dropped below the configured brush motor protection threshold. Consult battery type specifications to determine the required protection voltage.
E[A3]	10 Slow, 3 Fast	Suction function low voltage fault.	Battery voltage has fallen below the configured suction motor protection threshold. Determine the required protection voltage by consulting battery type specifications.
E[A4]	10 Slow, 4 Fast	System time storage fault.	/
E[A5]	10 Slow, 5 Fast	Parameter storage fault.	/
E[A6]	10 Slow, 6 Fast	System information storage fault.	/
E[A7]	10 Slow, 7 Fast	PFC file storage fault.	/
E[A8]	10 Slow, 8 Fast	Program file fault.	/
E[FF]		Controller and panel communication fault.	Check for loose connections between the controller and the panel, and ensure the four wires are correctly ordered.

▸ MACHINE MAINTENANCE

Please strictly adhere to the daily, weekly, and monthly maintenance procedures to ensure the machine remains in optimal working condition!

Warning: Electric shock hazard. Disconnect the battery terminals before servicing the machine.

DAILY MAINTENANCE (AFTER EACH USE)

1. Drain and clean the dirty water tank.
2. Remove and rinse the floating filter screen inside the dirty water tank.
3. Drain the clean water tank, and rinse the tank with hot water not exceeding 60°C if necessary.
4. Remove the cleaning pad/brush for cleaning. If worn, flip or replace the cleaning pad.
5. Wipe the squeegee blade. Store the squeegee assembly in the raised position to prevent blade damage.
6. Check the wear on the scraper edge of the squeegee blade. If worn, swap the blade ends.
7. Wipe the machine with a multi-purpose cleaner and a damp cloth.

NOTE: For safety purposes, do not use high-pressure spray or flush the machine with a water hose during cleaning to avoid causing malfunctions in electronic components.

8. Check the wear condition of the brush head skirt. Replace immediately if worn or damaged.
9. Charge the battery only after the machine has been used for more than 30 minutes each time, to prolong the battery's service life and ensure optimal machine performance.

MONTHLY MAINTENANCE (EVERY 80 HOURS OF USE)

1. Remove and clean the clean water tank filter from beneath the machine.
   Ensure the clean water tank is emptied before removing the filter.
2. Clean the battery terminals to prevent corrosion (refer to "Battery Maintenance").
3. Check the battery terminals for looseness.
4. Inspect and clean the seal on the dirty water tank lid. Replace if damaged.
5. Spray silicone-based dry lubricant on all pivots and rollers, then apply a layer of water-resistant lubricating oil to maintain smooth axle operation.
6. Check all nuts and bolts on the machine for tightness.
7. Inspect the machine for leaks.

QUARTERLY MAINTENANCE

1. Every 250 hours: Inspect the carbon brush wear on the drive motor (drive-type models), vacuum motor, and brush motor.
2. Replace carbon brushes when their length is worn down to within 10 mm. If the machine requires servicing, contact an authorized service center.

▸ MACHINE PARAMETERS

MODEL	X96	COMMENTS
Working width	960mm	
Squeegee width	1200mm	
Working capacity	7980m²/h	
Brush diameter	460mm*2	
Brush motor	36V/500W*2	
Motor speed	180rpm	
Vacuum motor	36V/650W	
Motor pressure	165mbar	
Clean/Dirty water tank	170L/175L	
Batteries	6V/200Ah*6	
Noise level	≤68dB(A)	
Net/Gross weight	295/485kg	
Brush pressure	60kg/cm²	
Max gradient	15%	
Drive motor	36V/650W	
Machine size(L*W*H)	1800*1100*1350mm	
Water gun pressure	2.8bar	
Water flow rate	17L/min	

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