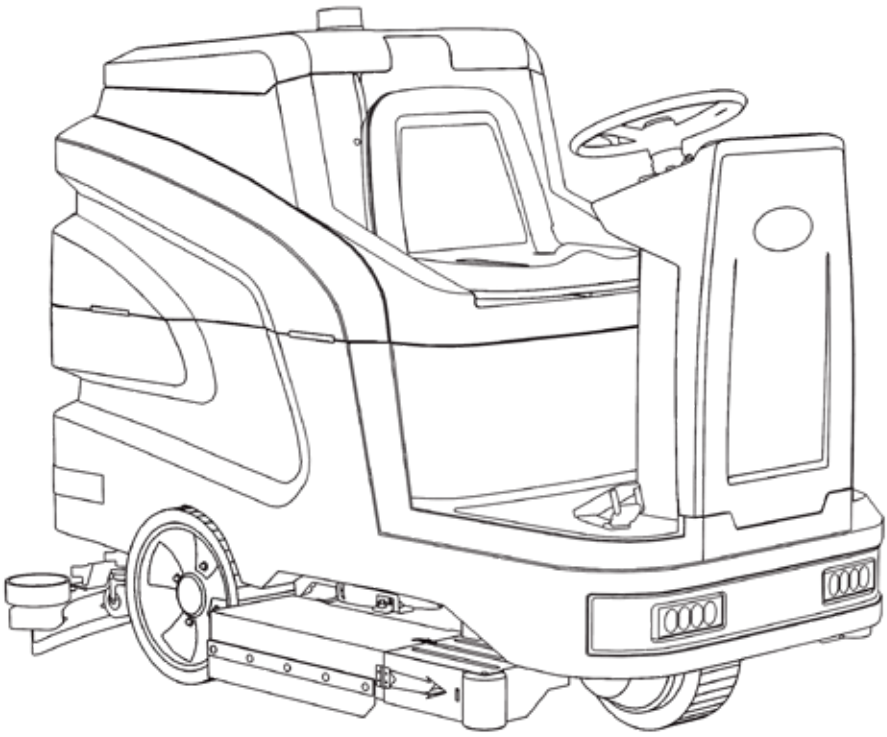
FLOOR SCRUBBER
MODEL: F1100



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 F1100 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.

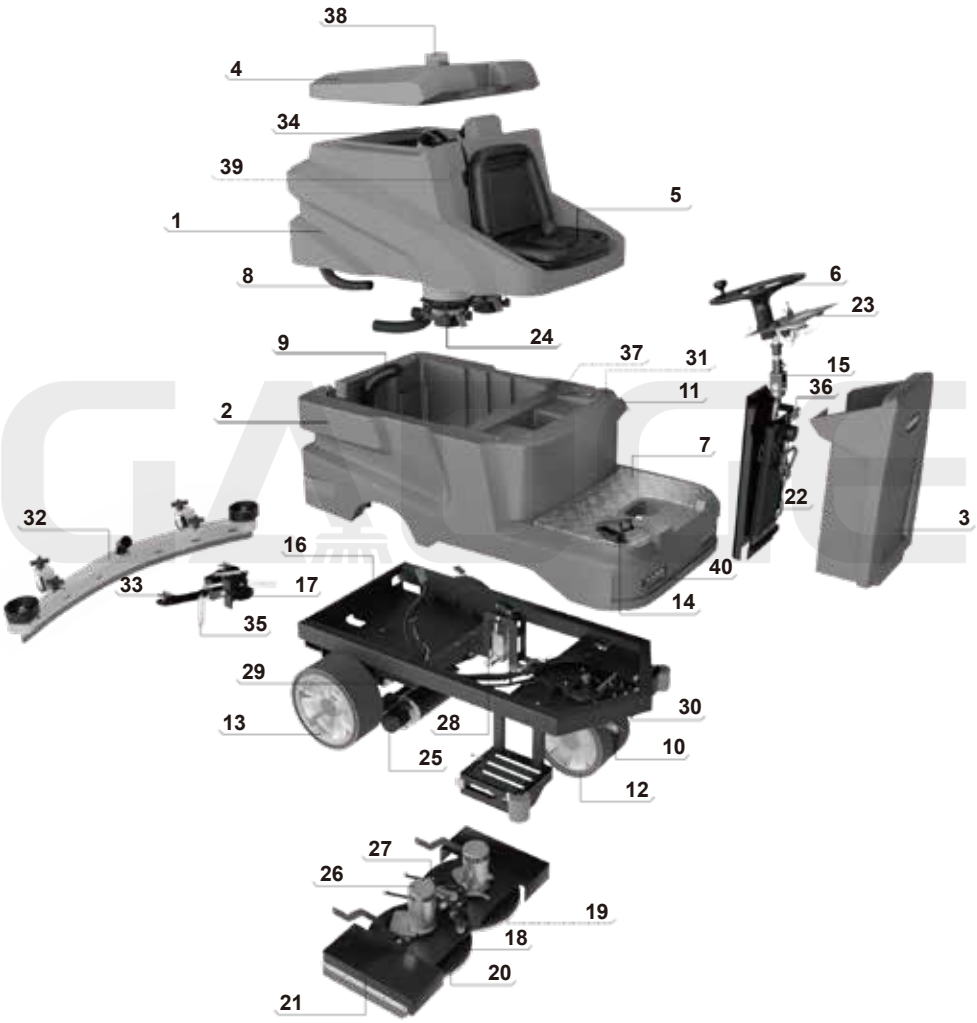
⑨ Operation in special environments (e.g., pharmaceutical industry, hospitals, chemical plants) must strictly comply with all applicable safety standards and regulations.

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

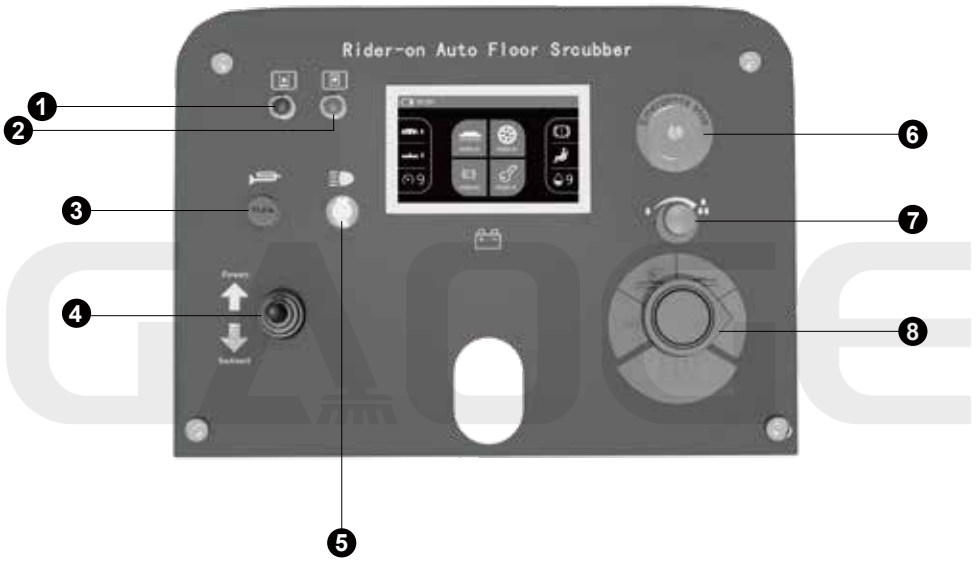


1. Dirty water tank
2. Clean water tank
3. Console housing
4. Sewage tank lid
5. Seat
6. Steering wheel
7. Aluminum step
8. Drain pipe
9. Suction hose
10. Steel wire hose
11. Clean water tank lid
12. front wheel
13. Drive wheel
14. Accelerator pedal
15. Steering linkage assembly
16. Chassis
17. Squeegee kit holder
18. Motor base
19. Flange
20. Brush
21. Water shield
22. Controller
23. Control panel
24. Vacuum motor
25. Rear axle assembly
26. Brush motor
27. Solenoid valve
28. Push rod
29. Push rod
30. Steering gear
31. clean water tank strainer
32. Squeegee
33. Nut
34. Float cage
35. Tension spring
36. Socket
37. Liquid level tube
38. Warning light
39. Wastewater tank sensor
40. Lighting lamp

▸ OPERATING CONTROLS

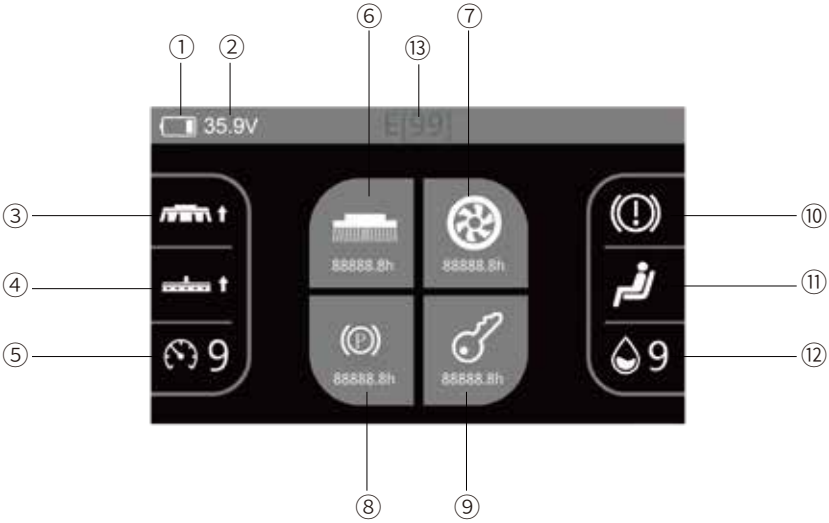
Centralized control panel with intuitive and easy-to-use operation. When operating, strictly follow these steps:
Activate the key switch and set the forward direction, adjust the water flow rate, then rotate the function knob to the "Scrubbing Disk + Water Suction" detent position to initiate the machinery.

CONTROL PANEL



1. Clean water tank indicator light
2. Dirty water tank indicator light
3. Trumpets
4. Forward and backward
5. LED light
6. Key switch
7. Water regulation
8. Squeegee and brush disk gear adjustment

DISPLAY SCREEN FUNCTION DESCRIPTION



①	Battery level.
②	Battery voltage.
③	Brush disc lifting motor operating status; Flashing during operation.
④	Squeegee lifting motor operating status; Flashing during operation.
⑤	Throttle input; with 10 gear positions (0-9).
⑥	Brush motor operating status & time.
⑦	Vacuum motor operating status & time.
⑧	Travel motor operating status and duration, with three positions: forward, neutral, and reverse.
⑨	Startup time.
⑩	Emergency stop state: An exclamation mark appears when the emergency stop switch is not released.
⑪	Seat switch status; flashes when the seat switch is invalid.
⑫	Water flow settings; 8 positions (0-7).
⑬	Fault Code Display: When a fault occurs, the fault code will be displayed in this area. The specific meaning of the code can be found in the Fault Code Descriptions.

▸ MAIN STRUCTURE

DIRTY WATER TANK

Large-capacity water tank design ensures work efficiency, with a float ball device for better motor protection.

Before use, check the following:

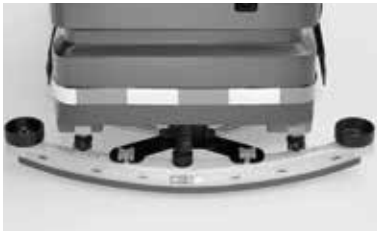
1. Whether the dirty water tank lid is securely closed.
2. Whether the cleaning access cover at the bottom of the dirty water tank is properly closed and tightened.
3. Whether there is air leakage in the suction hose.

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.

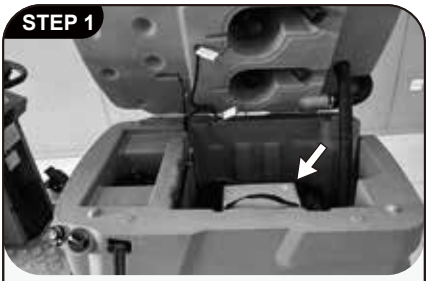


BRUSH

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.

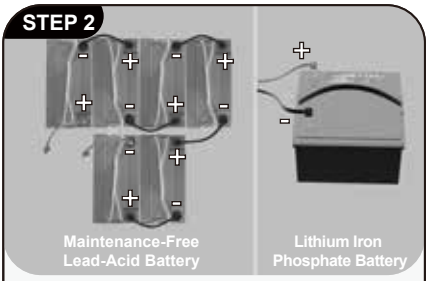
▸ INSTALLATION AND OPERATION

STEP 1



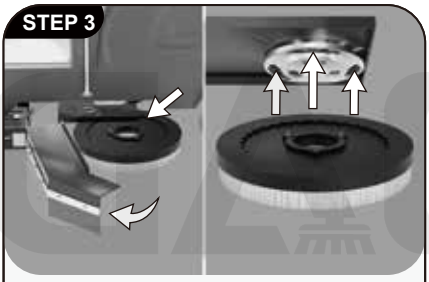
Open the dirty water tank cover and put in the battery.

STEP 2



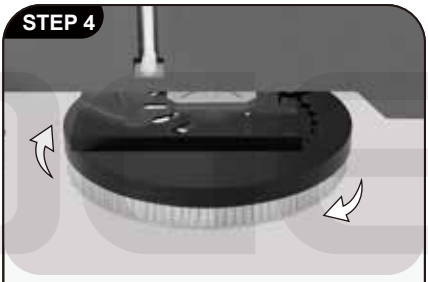
Connect the battery's positive and negative terminals with wires as shown in the picture, and then connect them to the device.

STEP 3



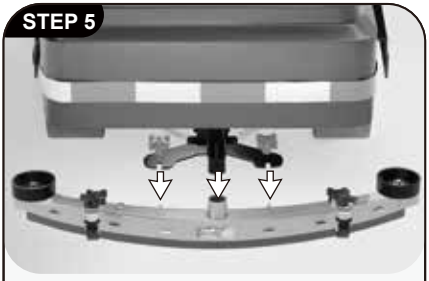
Open the water shield, position the brush plate into place, and align it precisely with the three positioning clips above.

STEP 4



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

STEP 5



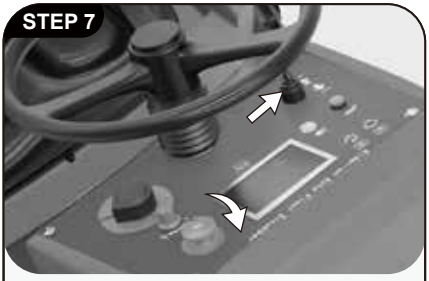
Install the squeegee assembly and tighten the knob securely. Connect the vacuum hose to the squeegee assembly, inspect the rubber blade, and make necessary adjustments.

STEP 6

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

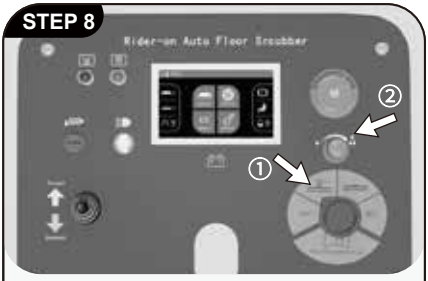
Note:If cleaning agent is added, an antifoaming agent must be simultaneously added to the dirty water tank to prevent motor damage.

STEP 7



First activate the key switch, then select the forward travel direction.

STEP 8



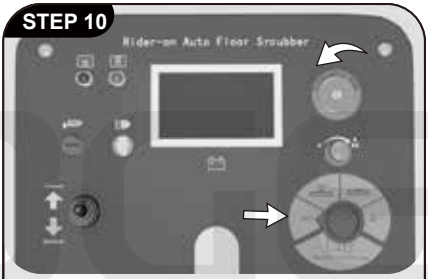
① Rotate the selector to the "Brush Plate & Squeegee Simultaneous Operation" position.

② Adjust the water volume level.

STEP 9

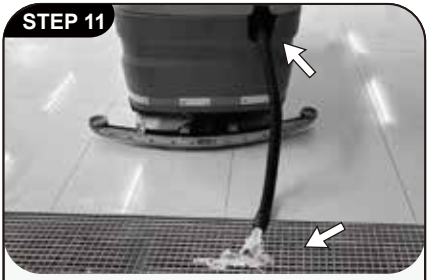
Step on the accelerator pedal to begin efficient operation.

STEP 10



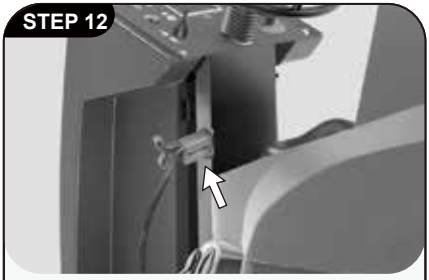
Turn the selector knob to the OFF position and switch the key to OFF.

STEP 11



When the dirty water tank reaches full capacity, promptly detach the dirty water hose and fully empty the sewage.

STEP 12



Recharge promptly after use. When the panel battery level reaches ≥84%, the display shows full bars. At ≤13%, the battery indicator shows zero bars and charging shall commence 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 Level: Voltage Range 33V–39V, Low-voltage Protection 33V

(On display panel: ≥84% = full bars; ≤13% = empty)

OVER/UNDER VOLTAGE PROTECTION

During operation, if the battery voltage falls below the low-voltage protection threshold or exceeds the high-voltage protection threshold, the brushing motor, solenoid valve, and suction motor will deactivate.

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.

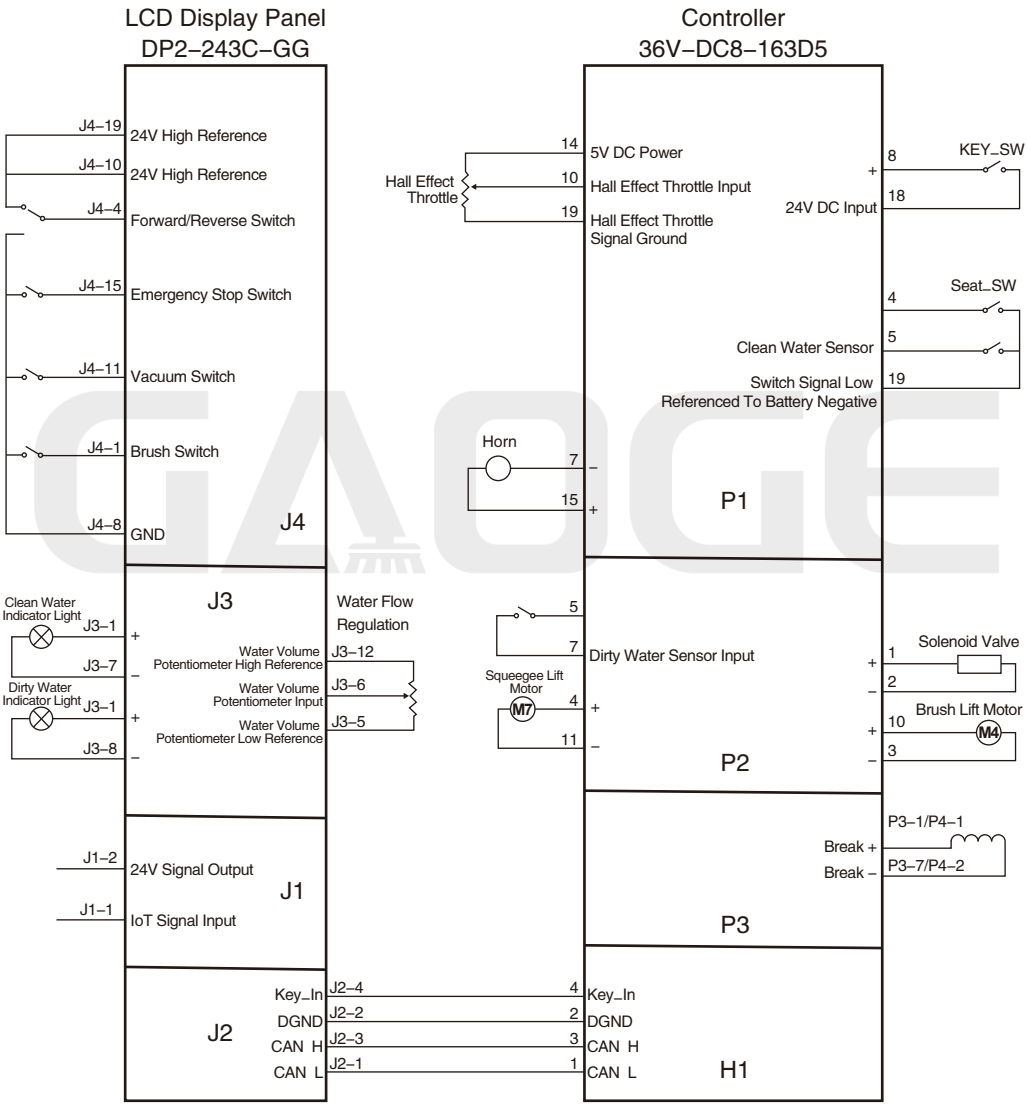
8. After charging is complete, check the electrolyte level again.

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—F1100



▸ 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 Shorted to Ground. 2.Controller Drive Motor Control MOSFET Damaged or Brake Control MOSFET Damaged. Troubleshooting: Disconnect the brake from the controller.If the fault disappears: Check for brake-to-ground short circuit. If the fault persists: Internal controller failure.
E[02]	2 quick flashes	Precharge fault 2.	1. Other Output Points Excluding Brake Shorted to Ground. (P1-15/P2-1/P2-8/P3-4/P3-5) 2. Motor Positive Terminal Shorted to Ground on Non-Drive Motors. (Brush/Suction/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 P1, P2, and P3 from the controller. Use a jumper wire to short P1-8 and P1-18. After powering on the controller, measure the voltage between P1-15 and B-. If the measured voltage is greater than the voltage at P1-18 minus 5V, there is a ground short circuit on the output points of P1, P2, or P3. Check each point 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 the voltage at P1-18 minus 5V, sequentially remove the brush disc and suction fan motor. If the fault disappears, inspect the brush disc or suction fan for ground short circuits. If the fault persists, the issue is likely an internal fault within the controller.
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 under-voltage 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 over-voltage fault.	Controller internal fault.
E[06]	6 quick flashes	12V-front under-voltage fault.	Controller internal fault.
E[07]	7 quick flashes	12V-CPU overvoltage fault.	Controller internal fault.
E[08]	8 quick flashes	12V-CPU undervoltage fault.	Controller internal fault.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[09]	9 quick flashes	CAN overvoltage fault.	Controller internal fault.
E[0A]	10 quick flashes	CAN undervoltage fault.	Controller internal fault.
E[10]	Slow flash once	PVDD2 overvoltage fault.	For 24V systems, BM+ voltage exceeds 34V. For 36V systems, BM+ voltage exceeds 45V.
E[11]	1 Slow, 1 Fast	PVDD2 under-voltage fault.	For 24V systems, BM+ voltage is below 12V. For 36V systems, BM+ voltage is below 12V.
E[12]	1 Slow, 2 Fast	Key switch overvoltage fault.	For 24V systems, P1-18 voltage exceeds 34V. For 36V systems, P1-18 voltage exceeds 45V.
E[13]	1 Slow, 3 Fast	Key switch under-voltage fault.	For 24V systems, P1-18 voltage is below 12V. For 36V systems, P1-18 voltage is below 12V.
E[14]	1 Slow, 4 Fast	Battery under-voltage fault.	For 24V systems, BAT+ voltage is below 12V. For 36V systems, BAT+ voltage is below 12V.
E[15]	1 Slow, 5 Fast	Battery overvoltage fault.	For 24V systems, BAT+ voltage exceeds 34V. For 36V systems, BAT+ voltage exceeds 45V.
E[16]	1 Slow, 6 Fast	Battery voltage limit low fault.	For 24V systems, BAT+ voltage is below 12V. For 36V systems, BAT+ voltage is below 12V.
E[17]	1 Slow, 7 Fast	Battery voltage limit high fault.	For 24V systems, BAT+ voltage exceeds 36V. For 36V systems, BAT+ voltage exceeds 47V.
E[18]	1 Slow, 8 Fast	12V drive voltage overvoltage fault.	Controller internal fault.
E[19]	1 Slow, 9 Fast	12V drive voltage undervoltage fault.	Controller internal fault.
E[1A]	1 Slow, 9 Fast	12V output overvoltage fault.	Controller internal fault.
E[20]	Slow flash 2 times	12V output undervoltage fault.	Controller internal fault.
E[21]	2 Slow, 1 Fast	VQEP1 overvoltage fault.	Controller internal fault.
E[22]	2 Slow, 2 Fast	VQEP1 undervoltage fault.	Controller internal fault.
E[23]	2 Slow, 3 Fast	5V output overvoltage fault.	Controller internal fault.
E[24]	2 Slow, 4 Fast	5V output undervoltage fault.	Controller internal fault.
E[25]	2 Slow, 5 Fast	UART overvoltage fault.	Controller internal fault.
E[26]	2 Slow, 6 Fast	UART undervoltage fault.	Controller internal fault.
E[27]	2 Slow, 7 Fast	VQEP2 overvoltage fault.	Controller internal fault.
E[28]	2 Slow, 8 Fast	VQEP2 undervoltage fault.	Controller internal fault.
E[29]	2 Slow, 9 Fast	Relay 1 connection fault.	The traveling motor control relay has opened, and it requires troubleshooting in conjunction with other faults.
E[2A]	2 Slow, 10 Fast	Relay 2 connection fault.	The floor cleaning function control relay has opened, and it requires troubleshooting in conjunction with other faults.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[30]	Slow flash 3 times	Phase A NTC Thermistor Fault of Drive Motor.	Controller internal fault.
E[31]	3 Slow, 1 Fast	Phase B NTC fhermistor Fault of Drive Motor.	Controller internal fault.
E[32]	3 Slow, 2 Fast	Brush plate motor NTC thermistor fault.	Controller internal fault.
E[33]	3 Slow, 3 Fast	Suction fan motor NTC thermistor fault.	Controller internal fault.
E[34]	3 Slow, 4 Fast	Drive motor A control temperature overheat fault.	Drive motor A control temperature overheat fault.
E[35]	3 Slow, 5 Fast	Drive motor A control temperature high limit fault.	Drive motor A control temperature high limit fault.
E[36]	3 Slow, 6 Fast	Drive motor B control temperature overheat fault.	Drive motor B control temperature overheat fault.
E[37]	3 Slow, 7 Fast	Drive motor B control temperature high limit fault.	Drive motor B control temperature high limit fault.
E[38]	3 Slow, 8 Fast	Brush plate motor control temperature overheat fault.	Brush plate motor control temperature overheat fault.
E[39]	3 Slow, 9 Fast	Brush plate motor control temperature high limit fault.	Brush plate motor control temperature high limit fault.
E[3A]	3 Slow, 10 Fast	Suction fan motor control temperature overheat fault.	Suction fan motor control temperature overheat fault.
E[40]	Slow flash 4 times	Suction fan motor control temperature high limit fault.	Suction fan motor control temperature high limit fault.
E[41]	4 Slow, 1 Fast	Drive motor A phase A MOS high voltage fault.	The Phase A voltage of the drive motor is excessively high. Disconnect the drive motor's wiring from the controller, restart the controller, and observe the fault. If the fault persists, it indicates an internal malfunction within the controller. Should the fault be resolved upon restart, inspect the drive motor's wiring for potential short circuits with the battery's positive (+) terminal.
E[42]	4 Slow, 2 Fast	Drive motor A phase A MOS low voltage fault.	The Phase A voltage of the drive motor is excessively low. Disconnect the drive motor's wiring from the controller, restart the controller, and observe the fault. If the fault persists, it indicates an internal malfunction within the controller. Should the fault be resolved upon restart, inspect the drive motor's wiring for potential short circuits with the battery's positive (+) terminal.
E[43]	4 Slow, 3 Fast	Drive motor B phase B MOS high voltage fault.	The Phase B voltage of the drive motor is excessively high. Disconnect the drive motor's wiring from the controller, restart the controller, and observe the fault. If the fault persists, it indicates an internal malfunction within the controller. Should the fault be resolved upon restart, inspect the drive motor's wiring for potential short circuits with the battery's positive (+) terminal.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[44]	4 Slow, 4 Fast	Travel motor B-phase MOS voltage low fault.	The B-phase voltage of the travel motor is too low. Disconnect the travel motor wiring from the controller and restart the controller. If the fault persists, it indicates an internal controller failure. If the fault disappears, check whether the travel motor wiring is short-circuited to the battery positive terminal.
E[45]	4 Slow, 5 Fast	Travel motor B-phase MOS voltage low fault.	/
E[46]	4 Slow, 6 Fast	Brush motor MOS undervoltage fault.	Brush motor BM undervoltage. Troubleshooting procedure: Disconnect the brush motor from the controller and restart the system. If the fault disappears: Check for ground short circuit in the brush motor wiring If the fault persists: Internal controller failure confirmed
E[47]	4 Slow, 7 Fast	Suction motor MOS overvoltage fault.	/
E[48]	4 Slow, 8 Fast	Suction motor MOS undervoltage fault.	Suction motor VM undervoltage. Troubleshooting steps: Disconnect the suction motor from the controller and restart the system. If fault clears: Inspect for ground short circuit in suction motor circuit If fault remains: Internal controller failure identified.
E[49]	4 Slow, 9 Fast	Brush lift MOS-A overvoltage fault.	Troubleshooting procedure: Disconnect the brush lift motor (terminals P2-3/P2-10) from the controller. If fault clears: Check for short circuit to B+/PVDD2 in motor wiring. If fault persists: Internal controller failure confirmed.
E[4A]	4 Slow, 10 Fast	Brush lift MOS-A undervoltage fault.	Troubleshooting procedure: Disconnect the brush lift motor (terminals P2-3/P2-10) from the controller. If fault clears: Check for ground short circuit in motor circuit If fault persists: Internal controller failure confirmed.
E[50]	4 Slow, 9 Fast	Brush lift MOS-B overvoltage fault.	Troubleshooting procedure: Disconnect the brush lift motor (terminals P2-3/P2-10) from the controller. If fault clears: Check for short circuit to B+/PVDD2 in motor circuit. If fault persists: Internal controller failure confirmed.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[51]	5 Slow, 1 Fast	Brush lift MOS-B low voltage fault.	Troubleshooting procedure: Disconnect the brush lift motor (terminals P2-3/P2-10) from the controller. If fault clears: Check for ground short circuit in motor circuit. If fault persists: Internal controller failure confirmed.
E[52]	5 Slow, 2 Fast	Water rake lift MOS-A high voltage fault.	Troubleshooting procedure: Disconnect the squeegee lift motor (terminals P2-4/P2-11) from the controller. If fault clears: Check for short circuit to B+/PVDD2 in motor circuit. If fault persists: Internal controller failure confirmed.
E[53]	5 Slow, 3 Fast	Water rake lift MOS-A low voltage fault.	Troubleshooting procedure: Disconnect the squeegee lift motor (terminals P2-4/P2-11) from the controller. If fault clears: Inspect for ground short circuit in motor wiring. If fault persists: Internal controller failure confirmed.
E[54]	5 Slow, 4 Fast	Water rake lift MOS-B high voltage fault.	Troubleshooting procedure: Disconnect the squeegee lift motor (terminals P2-4/P2-11) from the controller. If fault clears: Check for short circuit to B+/PVDD2 in motor circuit. If fault persists: Internal controller failure confirmed.
E[55]	5 Slow, 5 Fast	Water rake lift MOS-B low voltage fault.	Troubleshooting procedure: Remove the water raking mechanism lifting motor (P2-4/P2-11) from the controller. If the fault disappears, inspect the motor for a ground short circuit. If the fault persists, it indicates an internal fault in the controller.
E[63]	6 Slow, 3 Fast	Walking motor open circuit fault.	Troubleshooting procedure: Check if the drive motor is open circuit. Disconnect the drive motor from the controller, and measure whether there is continuity between the two motor wires. Verify that the wiring between the drive motor and the controller is correct.
E[64]	6 Slow, 4 Fast	Walking motor MOS-A short circuit fault.	The drive motor has a short circuit. Restart and check if the fault persists. If it reoccurs during every operation, inspect the motor for damage or external short circuit conditions.
E[65]	6 Slow, 5 Fast	Walking motor MOS-B short circuit fault.	The drive motor has a short circuit. Restart and check if the fault persists. If it reoccurs during every operation, inspect the motor for damage or external short circuit conditions.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[66]	6 Slow, 6 Fast	Walking motor overload fault.	/
E[67]	6 Slow, 7 Fast	Brush disk motor open circuit fault.	Troubleshooting procedure: 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. 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.	Translation: The brush disk motor has a short circuit. Restart and check if the fault persists. If it reoccurs during every operation, inspect the motor for damage or external short circuit conditions.
E[69]	6 Slow, 9 Fast	Brush disk motor overload fault.	Translation: The operating current and duration of the brush disk motor exceed the parameter-set protective current and time limits. Check for a locked rotor or other unexpected conditions.
E[6A]	6 Slow, 10 Fast	Suction motor open circuit fault.	Troubleshooting Method: 1.Check for an open circuit in the suction motor. Disconnect the suction motor from the controller and measure whether there is a connection between the two motor wires. 2.Check if 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 experiencing a short circuit. Restart and check if the fault has cleared. If the issue occurs every time it operates, inspect the motor for damage or potential external short circuit conditions.
E[71]	7 Slow, 1 Fast	Suction motor overload fault.	The operating current and duration of the suction motor exceed the preset protection thresholds for current and time. Check for potential blockages or other unexpected conditions.
E[72]	7 Slow, 2 Fast	Brush plate lifting motor open circuit fault.	Troubleshooting Method: 1.Check if the brush plate lifting motor is open-circuited. Disconnect the brush plate lifting motor from the controller and measure whether there is a connection between the two motor wires. 2.Check if the wiring between the brush plate lifting motor and the controller is correct.
E[73]	7 Slow, 3 Fast	Brush plate lifting motor short circuit fault.	The brush plate lifting motor is experiencing a short circuit. Restart and check if the fault disappears. If the issue recurs every time it operates, inspect the motor for damage or potential external short circuit conditions.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[74]	7 Slow, 4 Fast	Brush plate lifting motor overload fault.	The operating current and duration of the brush plate lifting motor exceed the preset protection thresholds for current and time. Check for potential blockages or other unexpected conditions.
E[75]	7 Slow, 5 Fast	Water squeegee lifting motor open circuit fault.	Troubleshooting Method: 1.Check if the water squeegee lifting motor is open-circuited. Disconnect the water squeegee lifting motor from the controller and measure whether there is a connection between the two motor wires. 2.Check if the wiring between the water squeegee lifting motor and the controller is correct.
E[76]	7 Slow, 6 Fast	Water squeegee lifting motor short circuit fault.	The water squeegee lifting motor is experiencing a short circuit. Restart and check if the fault disappears. If the issue recurs every time it operates, inspect the motor for damage or potential external short circuit conditions.
E[77]	7 Slow, 7 Fast	Water squeegee lifting motor overload fault.	The operating current and duration of the water squeegee lifting motor exceed the preset protection thresholds for current and time. Check for potential blockages or other unexpected conditions.
E[86]	8 Slow, 6 Fast	Output point 1 open circuit fault.	/
E[87]	8 Slow, 7 Fast	Output point 1 short circuit fault.	/
E[88]	8 Slow, 8 Fast	Output point 2 open circuit fault.	Output Point 2: Horn not properly connected. Troubleshooting Method: 1.Disconnect the horn and measure if it is open-circuited. 2.Check if the wiring is correct and whether there is a break in the wire.
E[89]	8 Slow, 9 Fast	Output point 2 short circuit fault.	Output Point 2: Horn connection has a short circuit. Troubleshooting Method: 1.Check if there is a short circuit between the two wires of the horn (resistance is very low). 2.Check if the horn is shorted to B- or B+.
E[8A]	8 Slow, 10 Fast	Output point 3 open circuit fault.	/
E[90]	Slow flash 9 times	Output point 3 short circuit fault.	/
E[91]	9 Slow, 1 Fast	Output point 4 open circuit fault.	Output Point 4: Solenoid valve not properly connected. Troubleshooting Method: 1.Disconnect the solenoid valve and measure if it is open-circuited. 2.Check if the wiring is correct and whether there are any breaks in the wire.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[92]	9 Slow, 2 Fast	Output point 4 short circuit fault.	Output Point 4: Solenoid valve connection has a short circuit. Troubleshooting Method: 1.Check if there is a short circuit between the two wires of the solenoid valve (with very low resistance). 2.Check if the solenoid valve is shorted to B- or B+.
E[93]	9 Slow, 3 Fast	Output point 5 open circuit fault.	/
E[94]	9 Slow, 4 Fast	Output point 5 short circuit fault.	/
E[95]	9 Slow, 5 Fast	Output point 6 open circuit fault.	Output Point 6: Electromagnetic brake not properly connected. Troubleshooting Method: 1.Disconnect the electromagnetic brake and measure if it is open-circuited. 2.Check if the wiring is correct and whether there are any breaks in the wire.
E[96]	9 Slow, 6 Fast	Output point 6 short circuit fault.	Output Point 6: Electromagnetic brake connection has a short circuit. Troubleshooting Method: 1.Check if there is a short circuit between the two wires of the electromagnetic brake (with very low resistance). 2.Check if the electromagnetic brake is shorted to B− or B+.
E[97]	9 Slow, 7 Fast	CAN dropped line fault.	The CAN connection between the controller and the LCD is disconnected. Check if the CAN communication lines are properly connected.
E[98]	9 Slow, 8 Fast	UART dropped line fault.	/
E[99]	9 Slow, 9 Fast	Throttle connection fault.	Check if the throttle input voltage is within the range configured by the controller. (For 24V machines: 0–5.4V; for 36V machines: 0.2–4.6V)
E[A0]	Slow flash 10 times	Throttle speed limiter connection fault.	Check if the throttle speed limiter potentiometer is correctly connected.
E[A1]	10 Slow, 1 Fast	High pedal inhibition fault.	High Pedal Inhibition: When the machine starts up, it enters a walkable state. Check the direction gear position and throttle input; verify if the throttle input voltage is within the controller's configured input voltage range. (For 24V machines: 0–5.4V; for 36V machines: 0.2–4.6V).
E[A2]	10 Slow, 2 Fast	Brush plate function low voltage fault.	The battery voltage is below the preset brush plate protection voltage. Refer to the battery type to determine the corresponding protection voltage value.
E[A3]	10 Slow, 3 Fast	Suction function low voltage fault.	The battery voltage is below the preset suction protection voltage. Refer to the battery type to determine the corresponding protection voltage value.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
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]	/	Communication fault between controller and panel.	Check if the wiring between the controller and the panel has loose connections, and verify whether the sequence of the four wires is correctly matched one-to-one.

▸ 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	F1100	COMMENTS
Working width	1050mm	
Squeegee width	1200mm	
Working capacity	9450m²/h	
Brush diameter	510mm*2	
Brush motor	36V/500W*2	
Motor speed	180rpm	
Vacuum motor	36V/450W*2	
Motor pressure	215mbar	
Clean/Dirty water tank	220L/235L	
Batteries	6V/200Ah*6	
Noise level	≤68dB(A)	
Net/Gross weight	586/780kg	
Brush pressure	65kg/cm²	
Max gradient	15%	
Front drive motor	36V1000W	
Rear drive motor	36V/1200W	
Machine size(L*W*H)	1800*1180*1480mm	

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