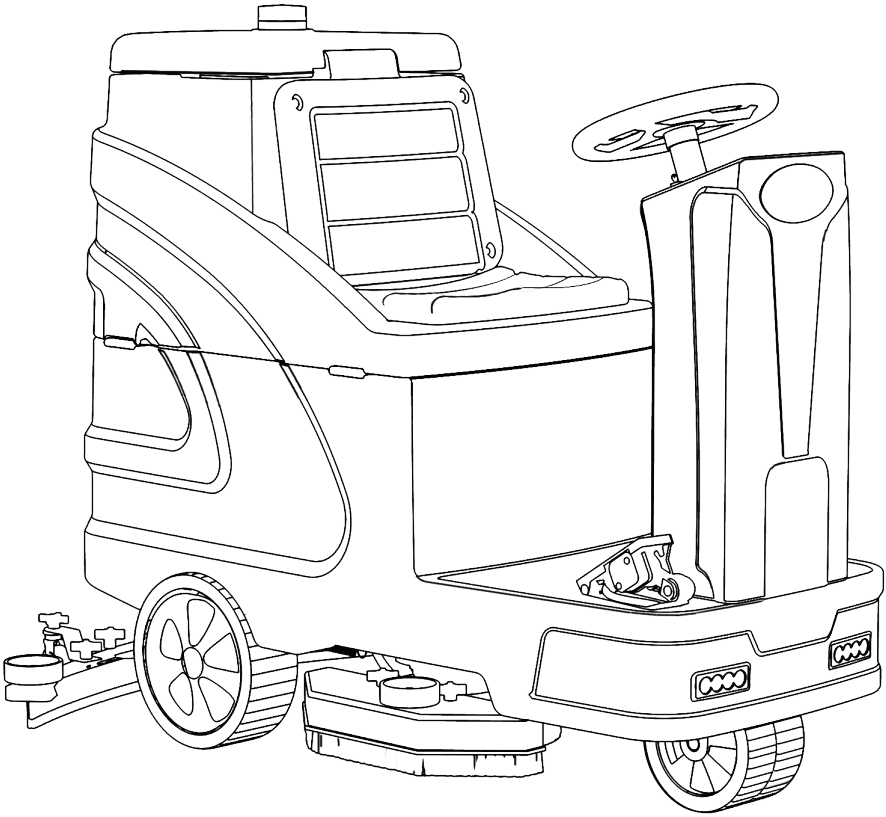
FLOOR SCRUBBER
MODEL: X68



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 X68 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.

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▸ 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.

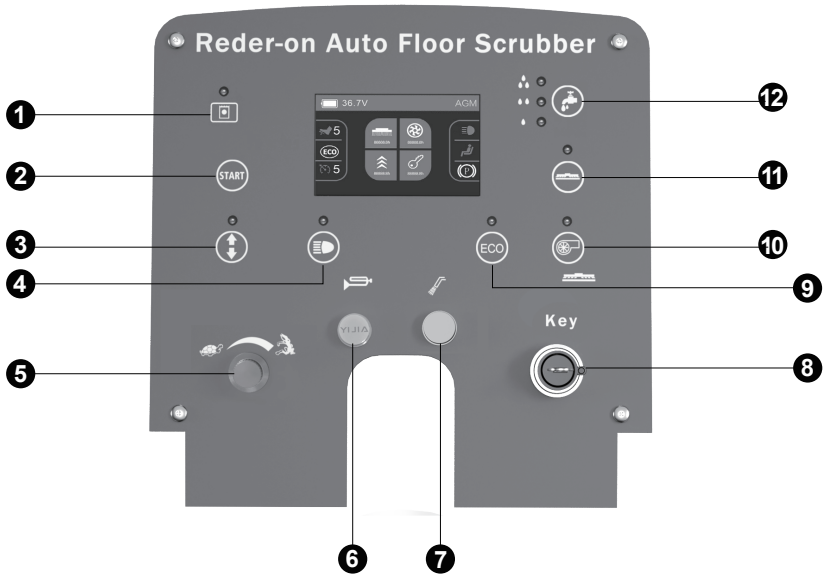
▸ MACHINE COMPONENTS

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 wheel
14. Drive wheel
15. Chassis
16. Motor base
17. Squeegee kit holder
18. Suspended platform
19. Flange
20. Water baffle
21. Controller
22. Control panel
23. Vacuum motor
24. Brush motor
25. Steering linkage assembly
26. Diaphragm pump
27. Rear axle assembly
28. Push rod
29. Steering large gear
30. Float cage
31. Filter basket
32. Sponge
33. Water gun
34. Spiral tube
35. Warning light
36. Socket
37. Liquid level tube
38. Wastewater tank sensor
39. Tension spring
40. Accelerator pedal
41. Lighting lamp
42. Solenoid Valve
43. Filter
44. PE12 Tee
45. Pipe
46. Squeegee
47. Steel wire rope
48. Rotating arm + ship block
49. Relay
50. Nut

▸ OPERATING CONTROLS

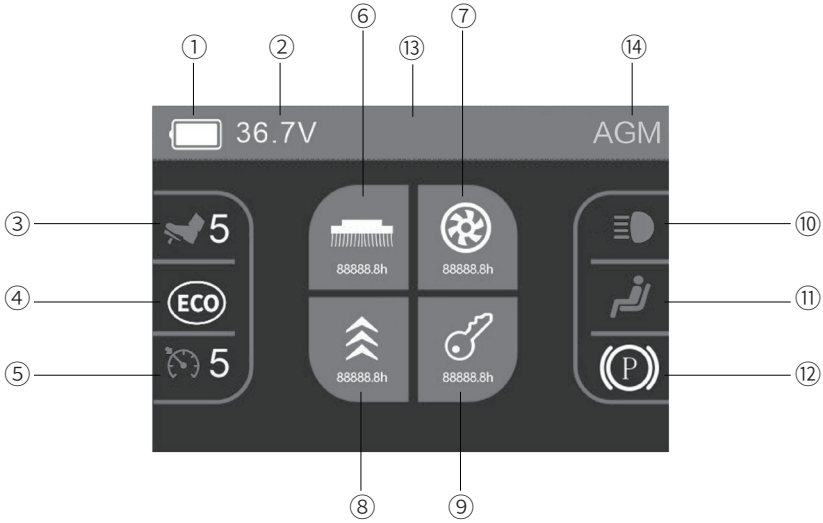
Smart control panel, featuring an added Eco-mode to enhance environmental friendliness and energy efficiency. Speed adjustment switch with an adjustable range of 1-12 km/h.

CONTROL PANEL



1. Dirty water tank full light
2. Start
3. Forward and backward
4. LED light
5. Speed adjustment
6. Trumpets
7. Water gun
8. Key switch
9. Energy-saving Mode
10. Squeegee
11. Brush
12. 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 large-capacity dirty water tank design ensures operational efficiency, while the integrated water float ball device provides enhanced protection for the motor.

Before use, check the following:

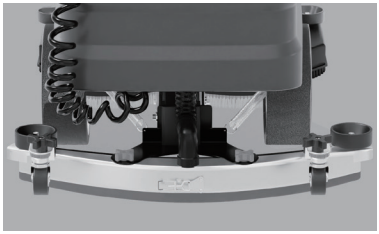
1. Whether the dirty water tank lid is securely closed.
2. Whether the cleaning access cover at the bottom of the dirty water tank is properly closed and tightened.
3. Whether there is air leakage in the suction hose.

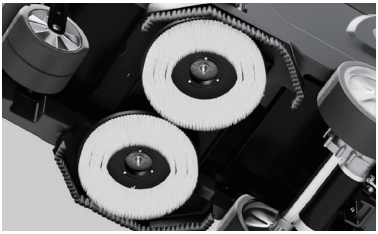
CLEAN WATER TANK

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.

LED LIGHT

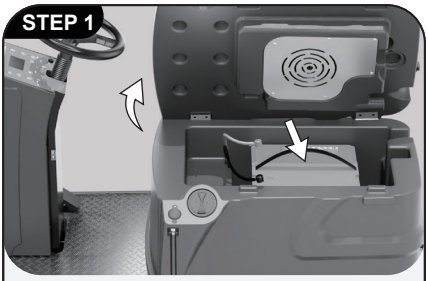
When working in dimly lit environments, please turn on the LED headlamps to improve both work efficiency and safety.

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.

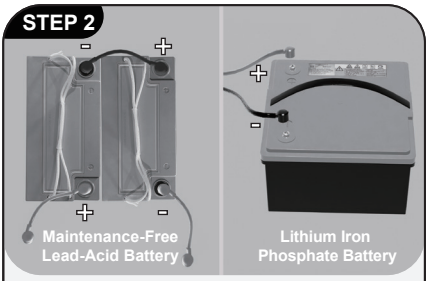
▸ INSTALLATION AND OPERATION

STEP 1



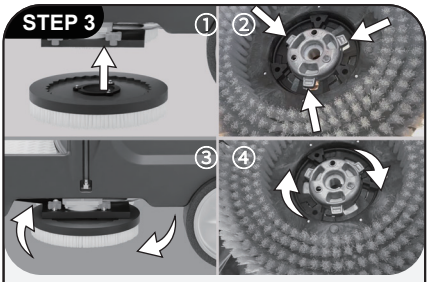
Open the dirty water tank cover and put in the battery.

STEP 2



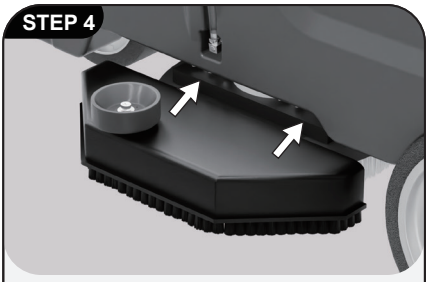
Connect the battery's positive and negative terminals with wires as shown in the picture, and then connect them to the device.

STEP 3



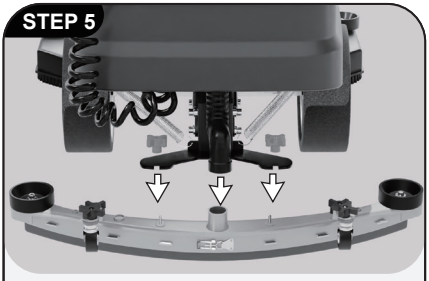
Align the brush plate with the upper flange, rotate it clockwise until the brush plate locks into place with the flange, and the installation is then complete.

STEP 4



Align the grooves of the water shield with the two nuts on the brush plate, secure them in place, then tighten the nuts to complete the water shield installation.

STEP 5



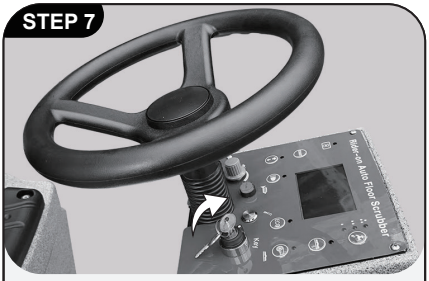
Install the squeegee assembly and tighten the knob securely. Connect the vacuum hose to the squeegee assembly, inspect the rubber blade, and make necessary adjustments.

STEP 6

Open the water filler lid, align the hose with the water filler port, and fill the tank.

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

STEP 7

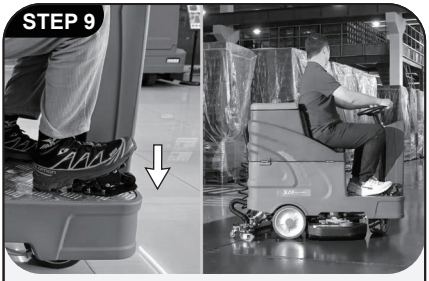


Sit in the driver's seat, then turn the key to light up the screen.

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

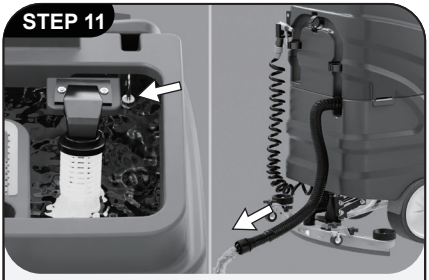


Step on the accelerator pedal to begin efficient operation.

STEP 10

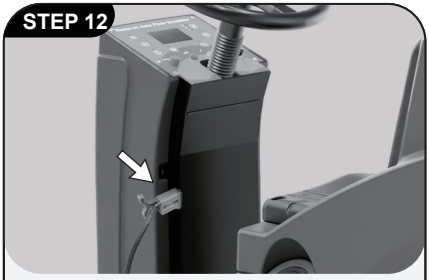
After cleaning is completed, click the Start button again, then turn off the key switch.

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 21.5V-25V, low-voltage protection 21.5V, high-voltage protection 34V.
LFP: Voltage range 22V-26V, low-voltage protection 22V, high-voltage protection 34V.
LIT: Voltage range 22V-26V, low-voltage protection 23.5V, high-voltage protection 34V.

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.

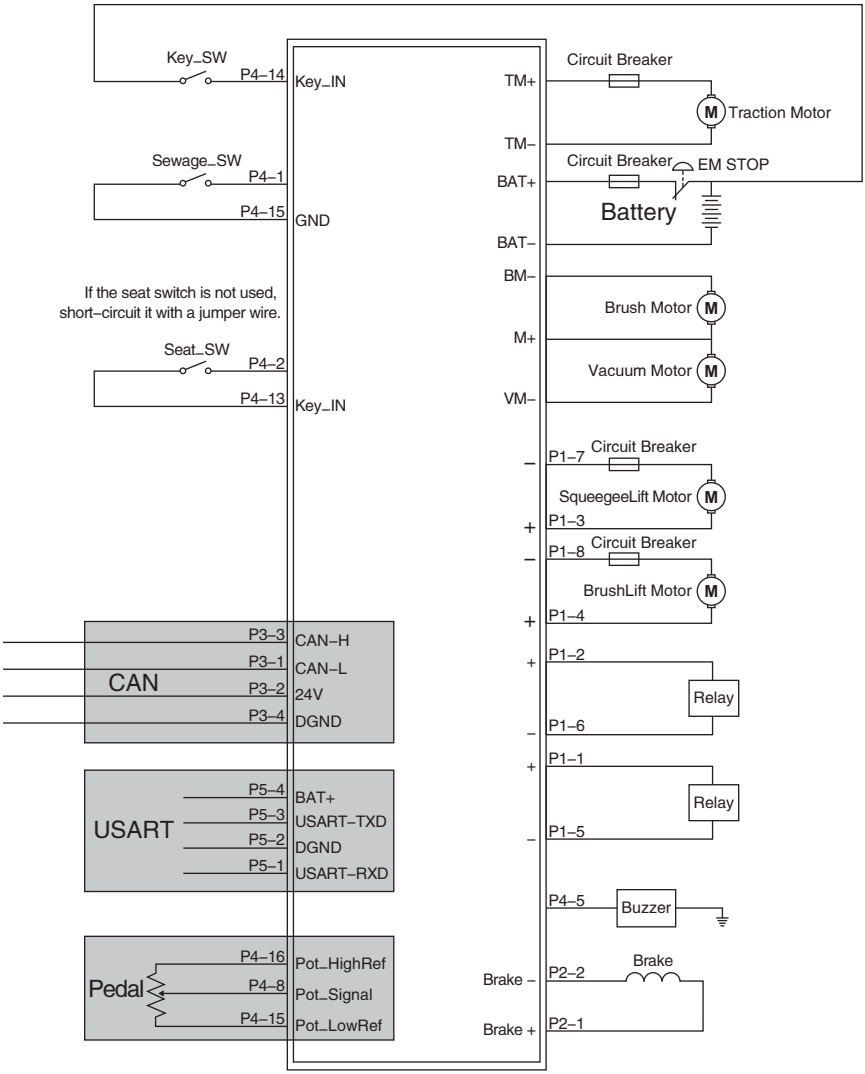
8. After charging is complete, check the electrolyte level again.

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—X68



▸ 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 drive motor control MOS damaged or brake control MOS damaged Troubleshooting: Disconnect the brake from the controller. If the fault disappears, inspect the brake for a short to ground.If the fault persists, this indicates an internal controller failure.
E[03]	3 quick flashes	PVDD1 over-voltage fault.	P2-1 voltage above 34V.
E[04]	4 quick flashes	PVDD1 under-voltage fault.	P2-2 voltage below 12V.
E[07]	7 quick flashes	12V-CPU over-voltage fault.	Internal controller failure.
E[08]	8 quick flashes	12V-CPU under-voltage fault.	Internal controller failure.
E[12]	1 Slow, 2 Fast	Key switch over-voltage fault.	P4-14/13 voltage above 34V.
E[13]	1 Slow, 3 Fast	Key switch under-voltage fault.	P4-14/13 voltage below 12V.
E[14]	1 Slow, 4 Fast	Battery under-voltage fault.	Battery voltage below 12V.
E[15]	1 Slow, 5 Fast	Battery over-voltage fault.	Battery voltage above 34V.
E[16]	1 Slow, 6 Fast	Battery critically low voltage fault.	Battery critically low voltage (<12V).
E[17]	1 Slow, 7 Fast	Battery critically high voltage fault.	Battery critically high voltage (>36V).
E[25]	2 Slow, 5 Fast	UART over-voltage fault.	Internal controller failure.
E[26]	2 Slow, 6 Fast	UART under-voltage fault.	Internal controller failure.
E[29]	2 Slow, 9 Fast	Relay 1 connection failure.	Drive motor short circuit or electromagnetic brake short to ground.
E[30]	Slow flash 3 times	Traveling motor phase A NTC failure.	Controller internal failure.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[31]	3 Slow, 1 Fast	Traveling motor phase B NTC failure.	Controller internal failure.
E[32]	3 Slow, 2 Fast	Brush motor NTC failure.	Controller internal failure.
E[33]	3 Slow, 3 Fast	Blower motor NTC failure.	Controller internal failure.
E[34]	3 Slow, 4 Fast	Traveling motor A control overtemperature failure	Traveling motor drive circuit temperature exceeds 75°C.
E[35]	3 Slow, 5 Fast	Traveling motor A control overtemperature limit fault.	Traveling motor drive circuit temperature exceeds 85°C.
E[36]	3 Slow, 6 Fast	Traveling motor B control overtemperature fault.	Traveling motor drive circuit temperature exceeds 75°C.
E[37]	3 Slow, 7 Fast	Traveling motor B control overtemperature limit fault.	Traveling motor drive circuit temperature exceeds 85°C.
E[38]	3 Slow, 8 Fast	Brush motor control overtemperature fault.	Brush motor drive circuit temperature exceeds 75°C.
E[39]	3 Slow, 9 Fast	Brush motor control overtemperature limit fault.	Brush motor drive circuit temperature exceeds 85°C.
E[3A]	3 Slow, 10 Fast	Blower motor control overtemperature fault.	Blower motor drive circuit temperature exceeds 75°C.
E[40]	Slow flash 4 times	Blower motor control overtemperature limit fault.	Blower motor drive circuit temperature exceeds 85°C.
E[41]	4 Slow, 1 Fast	Traveling motor phase A MOS overvoltage fault.	Traveling Motor Phase A has excessive voltage. Disconnect the traveling motor wiring from the controller, restart the controller. If the fault persists, it indicates an internal controller fault. If the fault clears, check whether the traveling motor wiring has a short circuit to the battery positive (+).
E[42]	4 Slow, 2 Fast	Traveling motor phase A MOS undervoltage fault.	Traveling Motor Phase A has an undervoltage fault. Disconnect the traveling motor wiring from the controller, restart the controller. If the fault persists, it indicates an internal controller fault. If the fault clears, check whether the traveling motor wiring has a short circuit to the battery positive (+).
E[43]	4 Slow, 3 Fast	Traveling motor phase B MOS overvoltage fault.	Traveling Motor Phase B has excessive voltage. Disconnect the traveling motor wiring from the controller, restart the controller. If the fault persists, it indicates an internal controller fault. If the fault clears, check whether the traveling motor wiring has a short circuit to the battery positive (+).

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[44]	4 Slow, 4 Fast	Traveling motor phase B MOS undervoltage fault.	Traveling Motor Phase B has an undervoltage fault. Disconnect the traveling motor wiring from the controller, restart the controller. If the fault persists, it indicates an internal controller fault. If the fault clears, check whether the traveling motor wiring has a short circuit to the battery positive (+).
E[45]	4 Slow, 5 Fast	Brush motor MOS overvoltage fault.	/
E[46]	4 Slow, 6 Fast	Brush motor MOS undervoltage fault.	Brush motor BM - undervoltage. Troubleshooting: Disconnect the brush motor from the controller and restart. If the fault disappears, check if the brush motor is shorted to ground. If the fault persists, it indicates an internal fault in the controller.
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: Disconnect the suction motor from the controller and restart. If the fault disappears, check whether the suction motor has a ground short.If the fault persists, then the controller has an internal fault.
E[63]	6 Slow, 3 Fast	Walking motor open circuit fault.	Troubleshooting: 1.Check whether the walking motor has an open circuit. Disconnect the walking motor from the controller and test for continuity between the two motor wires. 2.Check whether the walking motor is properly connected to the controller.
E[64]	6 Slow, 4 Fast	Walking motor MOS-A short circuit fault.	Walking motor short circuit. Restart and check whether the fault disappears. If it occurs every time during operation, check whether the motor is damaged or has a short circuit to external components.
E[65]	6 Slow, 5 Fast	Walking motor MOS-B short circuit fault.	Walking motor short circuit. Restart and check whether the fault disappears. If it occurs every time during operation, check whether the motor is damaged or has a short circuit to external components.
E[66]	6 Slow, 6 Fast	Walking motor overload fault.	/
E[67]	6 Slow, 7 Fast	Brush motor open circuit fault.	Troubleshooting: 1.Check whether the brush motor has an open circuit. Disconnect the brush motor from the controller and test for continuity between the two motor wires. 2.Check whether the brush motor is properly connected to the controller.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[68]	6 Slow, 8 Fast	Brush motor short circuit fault.	Brush motor short circuit. Restart and check whether the fault disappears. If it occurs every time during operation, check whether the motor is damaged or has a short circuit to external components.
E[69]	6 Slow, 9 Fast	Brush motor overload fault.	The brush motor's operating current and duration exceed the parameter-configured protection current and time limits. Check for blockages 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 fan motor. Remove the suction fan motor from the controller and measure whether there is a connection between the two motor wires. 2.Verify if the wiring between the suction fan motor and the controller is correct.
E[70]	Slow flash 7 times	Suction motor short circuit fault.	Check if the suction fan motor has short-circuited; restart it to see if the fault disappears. If the issue occurs every time it operates, inspect whether the motor is damaged or has an external short circuit.
E[71]	7 Slow, 1 Fast	Suction motor overload fault.	Check if the suction fan motor's operating current and duration exceed the parameter settings for protection current and time. Inspect for locked-rotor conditions or other unexpected situations.
E[86]	8 Slow, 6 Fast	Output point 1 (P1-5) open circuit fault.	Output point 1 improperly connected — solenoid valve. Troubleshooting: 1.Remove the solenoid valve and measure whether it has an open circuit. 2.Check if wiring is correct, or if broken wires exist in the circuit.
E[87]	8 Slow, 7 Fast	Output point 1 (P1-5) short circuit fault.	Output point 1 solenoid valve connection short circuit. Troubleshooting: 1.Check for a short circuit between the two wires of the solenoid valve (indicated by very low resistance). 2.Inspect whether the solenoid valve is shorted to B- or B+.
E[88]	8 Slow, 8 Fast	Output point 2 (P1-6) open circuit fault.	Output point 1 improperly connected — solenoid valve. Troubleshooting: 1.Remove the solenoid valve and measure for an open circuit. 2.Check wiring connections for correctness and inspect for broken wires in the circuit.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[89]	8 Slow, 9 Fast	Output point 2 (P1-6) short circuit fault.	Output point 2 vehicle lamp connection short circuit. Troubleshooting: 1.Check for a short circuit between the two wires of the vehicle lamp (typically indicated by near 0 Ω resistance). 2.Inspect whether the lamp circuit is shorted to B- or B+.
E[8A]	8 Slow, 10 Fast	Output point 3 (P2-2) open circuit fault.	Output point 1 electromagnetic brake open circuit fault. Troubleshooting: 1.Check for an open circuit between the two wires of the electromagnetic brake. 2.Verify whether the brake circuit is open to B- or B+ (unusual condition requiring isolation check).
E[90]	Slow flash 9 times	Output point 3 (P2-2) short circuit fault.	Output point 1 electromagnetic brake short circuit fault. Troubleshooting: 1.Check for a short circuit between the two wires of the electromagnetic brake (indicated by very low resistance, typically <5Ω). 2.Inspect whether the brake is shorted to B- or B+.
E[91]	9 Slow, 1 Fast	Output point 4 (P4-5) open circuit fault.	/
E[92]	9 Slow, 2 Fast	Output point 4 (P4-5) short circuit fault.	/
E[99]	9 Slow, 9 Fast	Throttle fonnection fault.	Check whether the throttle input voltage is within the configured input voltage range of the controller.
E[A1]	10 Slow, 1 Fast	High pedal prohibited fault.	High Pedal Inhibit: Vehicle enters drivable state immediately upon startup. Must check gear position and throttle input; verify throttle input voltage is within the controller's configured input voltage range.
E[A2]	10 Slow, 2 Fast	Brush disk function low voltage fault.	Battery voltage is below the configured brush protection voltage. Determine the protection voltage value based on battery type.
E[A3]	10 Slow, 3 Fast	Suction wind function low voltage fault.	The battery voltage is lower than the set suction protection voltage threshold. The protection voltage value shall be determined by referring to the battery type.
E[A4]	10 Slow, 4 Fast	System time storage fault.	Controller internal fault.
E[A5]	10 Slow, 5 Fast	Parameter storage fault.	Controller internal fault.
E[A6]	10 Slow, 6 Fast	System information storage fault.	Controller internal fault.
E[A7]	10 Slow, 7 Fast	PFC file storage fault.	Controller internal fault.

FAULT CODE	LED BLINKING	FAULT DESCRIPTION	DIAGNOSIS
E[A8]	10 Slow, 8 Fast	Program file fault.	Controller internal fault.
E[A9]	10 Slow, 9 Fast	Emergency stop fault.	Controller internal fault.
E[AA]	10 Slow, 10 Fast	Reverse lock fault.	Controller internal fault.
E[97]	9 Slow, 7 Fast	CAN bus off fault.	/

▸ 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	X68	COMMENTS
Working width	680mm	
Squeegee width	920mm	
Working capacity	4650m²/h	
Brush diameter	330mm*2	
Brush motor	24V/380W*2	
Motor speed	180rpm	
Vacuum motor	24V/500W	
Motor pressure	145mbar	
Clean/Dirty water tank	75L/80L	
Batteries	12V/100Ah*2	
Noise level	≤68dB(A)	
Net/Gross weight	145/215kg	
Brush pressure	38kg/cm²	
Max gradient	15%	
Drive motor	24V/500W	
Machine size(L*W*H)	1400*920*1100mm	
Water gun pressure	2.8bar	
Water flow rate	5.6L/min	

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