

N-20B

OPERATION

This manual is furnished with each new model.

It provides necessary operation and maintenance instructions.

Read this manual completely and understand the machine before operating or servicing it.

The descriptions contained in this document are not binding.

The company therefore reserves the right to make any modifications at any time to elements, details, or accessory supply, as considered necessary for reasons of improvement or manufacturing/commercial requirements.

The company reserves the right to make any technical and/or supply modifications. The images are for reference purposes only, and are not binding in terms of design and supply.

This machine will provide excellent service. However, the best results will be obtained at minimum costs if:

- The machine is operated with reasonable care.
- The machine is maintained regularly-per the machine maintenance instructions provided.
- The machine is maintained with manufacturer supplied or equivalent parts.



Specifications and parts are subject to change without notice

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SAFETY PRECAUTIONS

This scrubbing machine is designed for the professional cleaning of surface and floors in industrial, commercial and public environment. The machine is only suitable for use in closed or at least covered location.

Please use recommended pads, brushes and commercially approved floor cleaners intended for machine application.

The following warning alert symbol and the “FOR SAFETY” heading are used throughout this manual as indicated in their description.



WARNING: To warn of hazards or unsafe practices which could result in severe personal injury or death.

FOR SAFETY: To identify actions which must be followed for safe operation of equipment.

The following safety precautions signal potentially dangerous conditions to the operator or equipment. All operators must read, understand and practice them.



WARNING: Fire or Explosion Hazard

- Never use Flammable Liquids Or Operate Machine In Or Near Flammable Liquids, Vapors Or Combustible Dusts.

- This machine is not equipped with explosion proof motors. The electric motors will spark upon start up and during operation which could cause a flash fire or explosion if machine is used in an area where flammable vapors/liquids or combustible dusts are present.

- Do Not Pick Up Flammable Materials Or Reactive Metals.

- Batteries Emit Hydrogen Gas, Keep Sparks And Open Flame Away. Keep Battery Compartment Open When Charging.



WARNING: Electrical Hazard

- Disconnect Battery Cables and Charger Plug Before Servicing Machine.

- Do Not Charge Batteries with Damaged Power Supply Cord. Do Not Modify Plug.

If the charger supply cord is damaged or broken, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.



WARNING: Spinning brush, keep hands Away. Turn off power before working on machine.

OPERATION

FOR SAFETY:

1. Do not operate machine:
 - With flammable liquids or near flammable vapors as an explosion or flash fire may occur.
 - Unless trained and authorized.
 - Unless operator manual is read and understood.
 - If not in proper operating condition.
2. Before starting machine:
 - Make sure all safety devices are in place and operate properly.
3. When using machine:
 - Go slow on inclines and slippery surfaces.
 - Wear non-slip shoes.
 - Reduce speed when turning.
 - Report machine damage or faulty operation immediately.
 - Never allow children to play on or around.
 - Follow mixing and handling instructions on chemical containers.
 - Do not operate on inclines that exceed 5% (3°) .
4. Before leaving or servicing machine:
 - Stop on level surface.
 - Turn off machine.
 - Remove key.
5. When servicing machine:
 - Avoid moving parts. Do not wear loose jackets, shirts, or sleeves.
 - Disconnect battery cables and charger plug before working on machine.
6. Wear protective gloves and eye protection when handling batteries or battery cables.
 - Avoid contact with battery acid.
 - Do not power spray or hose off machine. Electrical malfunction may occur.
 - Use manufacturer supplied or approved replacement parts.
 - All repairs must be performed by a qualified service person.
 - Do not modify the machine from its original design.
7. When loading/unloading machine:
 - Drain tanks before loading.
 - Remove batteries before loading.
 - Move machine with others' assistance.
 - Turn machine off.
 - Put scrub head in the lowered position.
 - Use tie-down straps to secure machine.

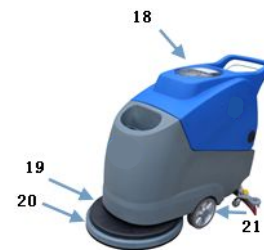
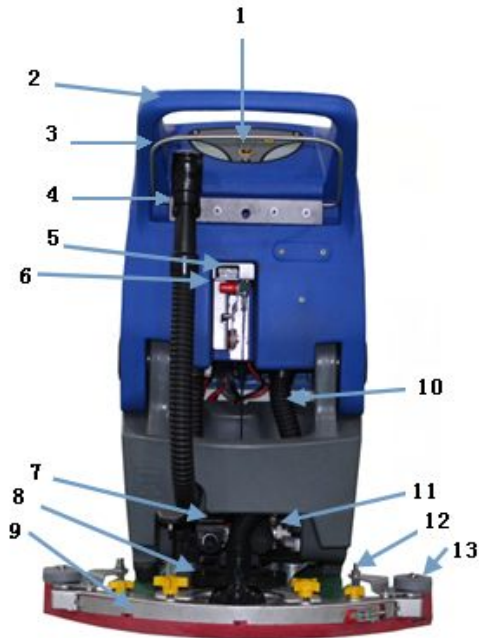
SAFETY LABELS

The safety labels appear on the machine in the locations indicated. Replace labels if they are missing , become damaged or illegible.

WARNING LABEL - Located on recovery tank cover.



MACHINE COMPONENTS



1. Main Power on/off Switch
2. Operating Handle
3. Startup Ring
4. Recovery Tank Drain Hose
5. Charging Socket
6. Squeegee Lift Pole
7. Solution Flow Control Knob
8. Brush Lift Pedal
9. Squeegee Assembly
10. Squeegee Vacuum Hose
11. Filter

12. Squeegee Wheel
13. Squeegee Fender Wheel
14. Brush Motor
15. Batteries
16. Recovery Tank Support Stand
17. Solution Tank / Water Tank
Injection Hole
18. Recovery Tank Cover
19. Brush Housing
20. Scrub Skirt
21. Wheel

PRELIMINARY MACHINE INSTALLATION

UNCRATING MACHINE

1. Carefully check the shipping crate for signs of damage. Report damage at once to carrier.
2. Check the contents list. Contact distributor for missing items.

Contents:

- . 100AH/150AH Batteries-Optional (Optional)
- . 24 V Battery Chargers-Optional
- . Squeegee Assembly
- . 1 Needle Base, 1 Brush (Optional)

Pads need to buy additional.

3. The machine is contained in specific packaging with a pallet for the handing with fork trucks. The packages Cannot be placed on top of each other.
4. Before uncrate your machine, remove the shipping hardware and straps that fixed the machine to the pallet. Careful unload the machine with others' help.

ATTENTION: Do not push machine from the pallet unless a ramp is used, machine damage may occur.

INSTALLING BATTERIES



WARNING: Fire Or Explosion Hazard. Batteries Emit Hydrogen Gas. Keep Sparks And Open Flame Away.

Keep Batteries Hood Open When Charging. You must carefully follow the instructions provided by the manufacturer, otherwise the manufacturer will not in charge of the consequence.

FOR SAFETY: For machine installing, please wear protective gloves and eye protection. Avoid contact with battery acids.

For a good operating performance, we suggest the use of 12V - 150Ah/C5 batteries.

1. Put the machine on level ground, and check the switch if closed;
2. Make sure the recovery tank is empty, otherwise empty it completely.



Figure 1.

3. Carefully install the batteries into the battery compartment tray. And arrange the battery binding posts as shown. (Figure 1)

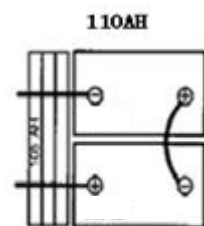


Figure 2.

4. House the batteries in the compartment(Figure 2), red to “+” and black to “-”, positioning them opposite each other.

CONNECTING THE BATTERY CHARGER

IMFORMATION: Make sure the charger is properly set for your battery type before charging, otherwise damage might be caused.

Please check the battery label to make sure the type of battery.

In order not to cause permanent damage to the batteries, it is essential to avoid their complete discharge: arrange the recharge within a few minutes of the switching on of the “discharged batteries” blinking light.



WARNING: Never leave the batteries completely discharged, even if the machine is not being used. Check the battery charger is suitable for the batteries installed, in terms of both capacity and type.

To connect the battery charger you must:

1. Move the machine near to the battery charger
2. Make sure the recovery tank is empty, otherwise empty it completely
3. Check the switch if closed



WARNING: This process must be carried out by qualified personnel. An incorrect connection of the connector may cause problems with machine functioning.

4. Disconnect the electric system connector from the battery connector.
5. Connect the battery charger cable to the battery connector.
6. Connect the recently wired cable to the external battery charger.
7. After the charging cycle is complete, the battery connector must be connected to the machine connector.

Attention: Please connect the charger connector to the power supply if use the onboard charger. The charger gets to work if the LED light comes on.



WARNING: Keep the recovery tank open for the duration of the battery recharging cycle to allow fumes to escape.

MACHINE CLEANING WAYS

Water and detergent from the solution tank flow to the floor through a solution valve. The brushes use the detergent and water to scrub the floor clean. As the machine moves forward, the squeegee wipes the dirty solution from the floor into the recovery tank.

BRUSH AND PAD INFORMATION

For best cleaning results use the appropriate brush type for your cleaning application. Refer to the Parts manual for part number information.

The proposed brushes and pads are as follow:

Soft Nylon Scrub Brush (53cm)

Recommended for cleaning coated floors without removing finish. Cleans without scuffing.

PAD HOLDER (53cm)

There are thousands of little hooks to hook up the pad.

Polishing pad (White)

Used to maintain highly polished or burnished floors.

Crash Pad (Red)

Used for light duty scrubbing without damaging floor finish.

MACHINE PREPARATION

SOLUTION TANK

The recovery tank must be completely empty each time the solution tank is filled. Remove the filler plug (1) on the right of the machine and check that the solution filter is installed properly.



WARNING: The recovery tank must be completely empty each time the solution tank is filled.

Check that the solution filter cap (Figure 3), under the solution tank in the front right of the machine, is properly closed.



Figure 3.

FILLING THE SOLUTION TANK

The solution tank can be filled in two different ways:

1. Filling it using a rubber tube (Figure 4).
2. Fill with clean water at a temperature not exceeding 50 C. The amount present in the tank can be seen through the level pipe on the front-right of the seat. The solution tank has a maximum capacity of about 65 litres. Add the liquid detergent to the tank in the concentration and manner indicated on the detergent manufacturer's label. To prevent the formation of excess foam that could damage the suction motor, use only the minimum amount of detergent that is necessary.



Figure 4.



WARNING: Always use detergents whose manufacturer's label indicates their suitability for scrubbing machines. Do not use acid or alkaline products or solvents without this indication. Acid or alkaline maintenance detergents can be used, as long as they have pH values between four and ten, and do not contain oxidising agent, chlorine or bromine, formaldehyde, mineral solvents.



WARNING: protective gloves should always be worn before handling detergents or acidic or alkaline solutions to avoid serious injury to hands.

ATTENTION: always use low foam detergent. To avoid the production of foam, before starting to clean, put a minimum quantity of antifoam liquid into the recovery tank. Do not use pure acids.

RECOVERY TANK

Make sure the recovery tank is empty, otherwise empty it completely.

- 1、Take down the wastepipes behind the machine and to the left, then rive the drain cover to complete drainage the sewage(**Figure 5**).
- 2、Check the cap of the drainage tube is correctly closed.



Figure 5↵

REPLACING SQUEEGEE BLADES AND ASSEMBLING THE SQUEEGEE

The squeegee, that for reasons of packaging comes disassembled from the machine, must be assembled while assembling the machine.

When the blades become worn, simply rotate the blades end-for-end or top-to-bottom to a new wiping edge. Replace blades when all edges worn.

1. Discharge the squeegee assembly from the machine.
2. Loosen the band clamp and remove the band from the squeegee assembly (**Figure 6**).
3. Replace or rotate the tear blade to a new wiping edge and replace band. Ensure the edge of the band lamp with sunken mouth is downward (**Figure 7**).

4. To change the front blade, discharge the rear band and loosen the four knobs. Replace the front blade to a new wiping edge, and then reinstall the positioning board (**Figure 8**). Ensure the sudden card of positioning board slots strip. Put back the band clamp in place and lock knobs.



Figure 6↵



Figure 7↵



Figure 8↵

ADJUSTING SQUEEGEE BLADES

Adjusting the squeegee blades only when the blades shifting.

To make the water absorption efficiency to achieve the best, adjust the height of the caster wheel as follow.

1. Remove the squeegee assembly to the surface floor and measure the distance between caster wheel and floor. The distance should be about 2mm. (Figure 9).



Figure 9

2. To adjust the height of caster wheel, loosen top nuts and take down plastic bearing cover. And then rotation the nuts until the height suitable (Figure 10). After adjusting, tighten top nuts and replace plastic bearing cover. Repeat the above steps to adjust the other foot wheel.



Figure 10

Attention: These operations must be carried out using protective gloves to avoid any possible contact with the edges or tips of metal objects.

ASSEMBLING THE BRUSH/PADS

For safety: Before installing brushes or needle base, stop machine on a level surface


1. Check the switch if closed.
2. Trample the brush head lift pedal. The brush head will rose from the floor, then put the brushes in the housing of the plate under the brush head (Figure 11), open the main switch and put the button, the machine will install the brush automatically.
3. Attach the pad to the needle base as installing the brush except put the pad on the needle base. (Figure 12)




Figure 11



Figure 12

 **WARNING:** You are advised to always wear protective gloves, to avoid the risk of serious injury to your hands.

 **WARNING:** During this operation, check there are no people or objects near the brush.

MACHINE OPERATION

For safety: Please do not operate the machine before reading and understanding this operation

manual.



WARNING: Fire Or Explosion Hazard. Do Not Pick Up Flammable Materials Or Reactive Metals.

PRE-OPERATIONAL EXAMINATION

1. Check the key switch if opened.
 2. The show-windows of panel show battery power.
 3. Check the wear of pad/brush.
 4. Check the squeegee assembly to ensure that it is properly adjusted.
 5. Make sure the recovery tank is empty, the float filter screen is installed and clean.
 6. Check the scrub head skirt for wear.
-

STARTING THE MACHINE

1. Turn the key to the (I) position (Figure 13).
2. Lower the squeegee assembly to the floor by lowering the squeegee lift lever (Figure 14), vacuum motor will automatically start.
3. Trample the brush head lift pedal. The brush head will rose from the floor (Figure 15).
4. Pull the startup ring to oneself and begin scrubbing (Figure 16), the motor drive will go ahead by pushing.

NOTE: 45-60 meters per minute is the recommended scrubbing speed.



Figure 13⁴



Figure 14¹



Figure 15⁴



Figure 16⁴

4. Scrubbing method: Adjust the solution control knob to a desired water flow (Figure 17).
5. Cleaning extremely dirty areas to raise the pressure pole for scrubbing heavily soiled area.



Figure 17⁴

OVERFLOW DEVICE

The machine is not equipped with an overfill device (**Figure 18**), because the capacity of the recovery tank is greater than the capacity of the solution tank. In extraordinary cases, there is a mechanical device (float) inside the recovery tank that, when the recovery tank is full, shuts off the air to the suction motor intake to protect it; and in this case the sound of the vacuum motor will be deeper. If this happens, raise the squeegee by turning the left-hand lever clockwise. After about 15–25 seconds, switch off the suction motor by turning the key to the “0” position. Take the machine to the designated water drainage area and then proceed with emptying the recovery tank through a special drainage pipe.



Figure 18

WHILE OPERATING MACHINE



WARNING: Fire Or Explosion Hazard. Do Not Pick Up Flammable Materials Or Reactive Metals.

For Safety: please walk slowly when the machine slopes and slips. Wearing non-slip shoes.

1. Overlap each scrub path by 5 cm.
2. Keep the machine moving to prevent damage to floor finish.
3. Scrub adhesive tape to avoid drag mark.
4. Do not operate the machine on inclines that exceed 5% (3°) .
5. Pour a commercially approved foam control solution into the recovery tank if excessive foam appears.
6. For heavily soiled areas, use double scrubbing method. First scrub the area with the squeegee up, let solution set for 3-5 minutes, then scrub the area a second time with squeegee down.
7. When leaving the machine unattended, remove the key and set parking brake, if equipped.

AT THE END OF WORK

At the end of the work, and before carrying out any type of maintenance, please perform the following operations:

1. Trample the lift pedal to rise the squeegee, the vacuum motor will closed automatically after about 15–25 seconds.
2. Turn the key to the “0” position and pull it out, then bring the machine to the place provided for draining the water.



WARNING: Before performing any maintenance, remove the keys from the panel and disconnect the battery connector of the machine.

3. Disconnect the tube from its seat, unscrew the drainage cap and empty the recovery tank.



WARNING: This operation must be carried out using gloves to protect against contact with

OPERATION

dangerous solutions.

4. Slide the suction tube from the squeegee sleeve.
5. Loose the two screws to discharge the squeegee (Figure 19).
6. Clean well both the squeegee and the rubbers with a jet of water.
7. After cleaning the squeegee and rubbers, replace the squeegee on the initial support.
8. Finally insert the squeegee tube in the special sleeve (Figure 20).
9. If you need to empty the solution tank, rive the cover.
10. Open the cap of the solution tank discharge pipe, empty the tank (Figure 21) .
11. Close the cap of the solution tank discharge pipe.
12. Park the machine in a closed place, in an area where it cannot cause damage to people or other property, but also be protected from an accidental fall of objects.
13. Lift the recovery tank and disconnect the battery connector.




Figure 19



Figure 20




Figure 21

 **WARNING:** do not leave the machine unattended without first removing the start-up switch key and applying the parking brake. In addition, do not park the machine in open places or on sloping floors.

CHARGING BATTERIES

Attention: To prolong the life of the batteries only recharge the batteries if the machine was used for a total of 30 minutes or more. Do not leave batteries discharged for lengthy periods.

 **WARNING:** Fire or Explosion Hazard. Batteries Emit Hydrogen Gas. Keep sparks and open flame away. Keep battery compartment open when charging.

For Safety: When servicing batteries, wear protective gloves and eye protection when handling batteries and battery cables. Avoid contact with battery acid.

BATTERY CHARGER SPECIFICATIONS

- CHARGER TYPE:
 - FOR SEALED (Gel) BATTERIES
 - FOR WET (Lead acid) BATTERIES
- OUTPUT VOLTAGE - 24VOLTS

- OUTPUT CURRENT - 11AMPS
- AUTOMATIC SHUTOFF CIRCUIT
- FOR DEEP CYCLE BATTERY CHARGING

DAILY MAINTENANCE

To keep the machine in good working condition, it's important that the following maintenance procedures are performed on a routine basis.

CLEANING THE RECOVERY TANK

1. Disconnect the tube (Figure 22) from its seat, unscrew the drainage cap and empty the recovery tank.



Figure 22



WARNING: Before performing any maintenance, remove the keys from

the panel and disconnect the battery connector of the machine.

ATTENTION: This operation must be carried out using gloves to protect against contact with dangerous solutions.

2. Remove the vacuum cover (Figure 23).
3. Clean and rinse the recovery tank.
5. Clean the filters.



Figure 23



WARNING: Be careful not to hit the recovery tank float directly, as this would enable water to enter the vacuum motor connected to it.

CLEANING THE SQUEEGEE

The careful cleaning of the whole vacuum unit ensures better drying and cleaning of the floor as well as greater duration of the suction motor. Proceed as follows for cleaning:

1. Slide the suction tube from the squeegee sleeve.
2. Remove the squeegee from the support arm by unscrewing the handwheels (Figure 24).



Figure 24

3. Use a damp cloth to clean the front and rear rubbers, and also clean the vacuum chamber of the squeegee body.

OPERATION

ATTENTION: this operation must be carried out using gloves to protect against contact with dangerous solutions.

4. Check the wear of the rubbers. If the edge of the rubber is badly damaged, the rear rubber can be turned on all four edges. If the rubbers are completely worn proceed with the replacement (Figure 25). To remove the rubber, turn the wing nuts in a horizontal position, remove the rubber-pressing blades and then remove the rubber to turn it or replace it.
5. Clean the vacuum nozzle. To do this, remove it from the squeegee body by rotating the knobs anticlockwise (Figure 26).
6. Reassemble the vacuum nozzle on the squeegee body.



Figure 25



Figure 26

7. After cleaning, replace the squeegee on the initial support, firstly inserting the squeegee in the initial support, tighten the rotary knobs (Figure 27).

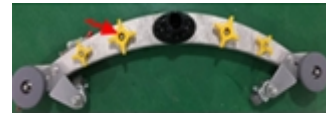


Figure 27

WEEKLY MAINTENANCE

CLEANING THE SUCTION HOSE

Whenever suction seems to be unsatisfactory, check that the suction tube is not obstructed. If necessary clean with a jet of water as follows:

1. Make sure the recovery tank is empty, otherwise empty it completely.
2. Check the main switch if closed.
3. Disconnect the suction hose from the squeegee nozzle.



WARNING: This operation must be carried out using gloves to protect against contact with dangerous solutions.

4. Detach the aspiration tube from the seat on the recuperation tank.
5. Clean it with a water jet introduced from the side where it is connected to the tank.
6. Reassemble all the elements.

CLEANING THE BRUSH

Thorough cleaning of the brush will guarantee a better working capacity. Proceed as follows for cleaning:

1. Check the main switch if closed.
2. Trample the lift pedal to rise the squeegee (Figure 28).
3. Pull the startup ring, the brush will fall off automatically (Figure 28).



Figure 28

⚠ WARNING: During this operation, check there are no people or objects near the brush.

4. Take the brush and clean it under a flowing jet of water.
5. Reassemble it on the brush head body.

CLEANING THE SOLUTION TANK FILTER

Careful cleaning of the detergent/water solution filter ensures a better working capacity.

Proceed as follows for cleaning:

1. Check the main switch is if closed.
2. Close the filter valve.
3. Open the filler cap (Figure 29).
4. Remove the internal filter cartridge and rinse everything thoroughly with running water.
5. Reassemble all the elements.



Figure 29

EXTRAORDINARY MAINTENANCE

REPLACING THE SQUEEGEE RUBBER

Suction will be poor and the machine will not dry perfectly if the squeegee rubber is worn. Proceed as follows to replace:

1. Check the main switch if closed.
2. Disconnect the squeegee by loosening the 4 knobs (Figure 30).

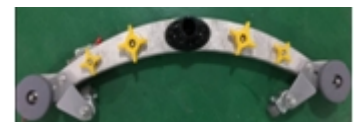


Figure 30

⚠ WARNING: Before performing any maintenance, remove the key from the panel and disconnect the battery connector.

3. Just loose the 4 knobs.



Figure 31

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4. Remove the rear rubber-pressing blades and then remove the rubber (Figure 31).
5. To replace the rubber, proceed in reverse order (Figure 32).



Figure 32



WARNING: These operations must be carried out using gloves to protect against contact with dangerous solutions.

REPACE THE BRUSH

1. Check the main switch if closed.
2. Raise the brush head by trampling the lift pedal.
3. Press the brush release button and it will off automatically.
4. Take up the brush and replace it.



WARNING: During this operation, check there are no people or objects near the brush.

MOTOR MAINTENANCE

Contact an Authorized Service Center for carbon brush replacement.

Carbon Brush Replace	Hours
Drive Transaxle Motor	750
Vacuum Motor	750
Disk Brush Motors	750



WARNING: Electrical Hazard. Disconnect Battery Cables Before Servicing Machine.

TROUBLESHOOTING

PROBLEM	SOLUTION
The machine does not start	Check that batteries are charged
	Make sure the electric system connector is connected to the battery connector
	Check the key switch is ON/OFF
Insufficient water on the brushes	Check there is water in the solution tank
	Check the water/detergent solution release adjustment knob is opened.
The squeegee not dry perfectly	Check the squeegee is clean
	Check the squeegee settings (see "MACHINE PREPARATION")
	Clean the entire vacuum unit (see "WEEKLY MAINTENANCE")
	Replace the rubbers, if worn
The machine does not clean well	Check the state of wear and tear of the brushes and, if necessary, replace them. The brushes should be changed when the bristles are about 15mm long. To replace them, see "REPLACING THE BRUSHES", or "DISASSEMBLING THE BRUSHES" and "ASSEMBLING THE BRUSHES". Working with over-worn brushes may cause damage to the floor.
	Use a different kind of brush to the one fitted as standard. For cleaning floors where the dirt is particularly resistant, we recommend the use of special brushes supplied upon request and according to needs (see "CHOOSING AND USING THE BRUSHES").
Excessive foam production	Check that a low foam detergent has been used. If necessary, add a small quantity of antifoam liquid to the recovery tank. Remember that, when the floor is not very dirty, more foam is generated. In this case the detergent solution should be more diluted.
The suction motor does not function	Check whether the recovery tank is full and, if necessary, empty it
	Check the float switch on the suction cap (see also "CLEANING THE RECOVERY TANK" in the paragraph "DAILY MAINTENANCE")

OPERATION

The brush motor does not work	Check the scrub head if be down
	Recharge batteries
	C heck the fault of trigger switch(es)
	Check the brush circuit breaker button
	Worn carbon brushes, please change them