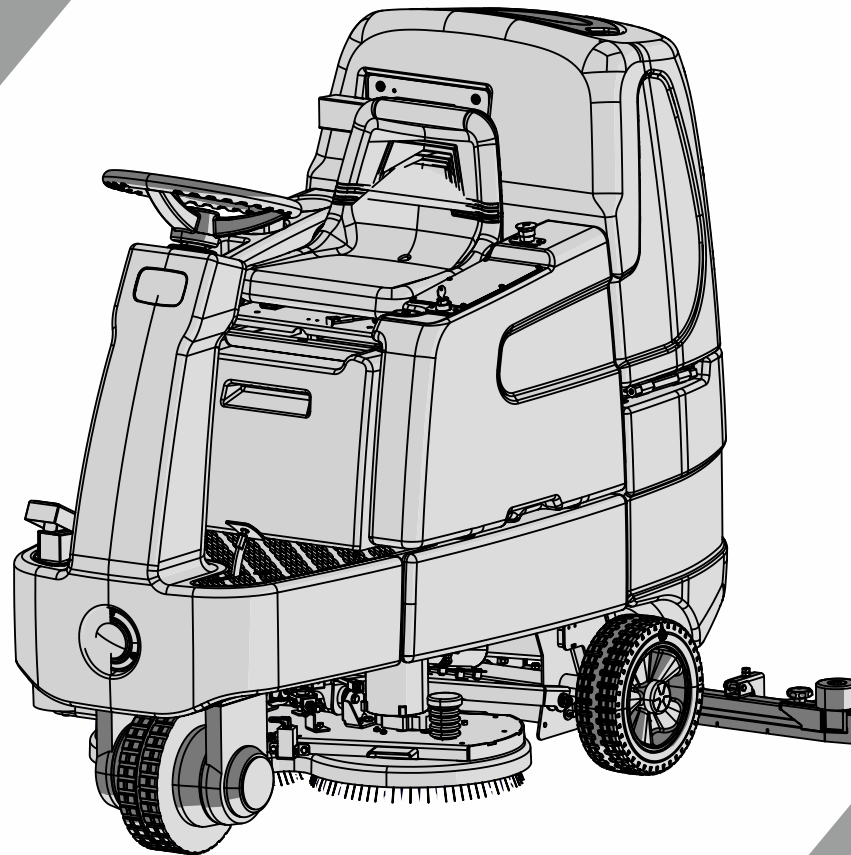


# RootsScrub RB 800/950

*Ride On Scrubber Drier*

*Battery*



24V  
200Ah  
240Ah  
320Ah

## Operator's Manual

Read this manual completely and understand the instructions before operating the machine.  
"English Version"



# TABLE OF CONTENTS



4	Introduction
6	Technical specification - RB 800
7	Technical specification - RB 950
8	Customer support system
9	General safety instructions
14	Know your machine
15	Decals on the machine
16	Machine operation
25	Maintenance
27	Troubleshooting
28	Do's and Don'ts
29	Battery system

## **IMPORTANT NOTE:**

Roots Multiclean Ltd. (RMCL) is not liable for any legal claims that may arise as a direct or indirect result of the contents of this manual.

Roots Multiclean Ltd.  
R.K.G. Industrial Estate, Ganapathy,  
Coimbatore - 641 006, India.

### **MACHINE DATA**

*Please fill at the time of installation for future reference:*

*Model No. - \_\_\_\_\_*

*Serial No. - \_\_\_\_\_*

*Battery No. - \_\_\_\_\_*

*Installation Date - \_\_\_\_\_*

**P/N: 557100141-00, Rev-A, 04/2019**

*Prepared by KM, NPM TD Dept.*

# INTRODUCTION



## PREFACE

### *Dear Customer,*

We are pleased with you having chosen the **RootsScrub RB 800/950** for your floor cleaning requirements. Backed by our industry expertise that spans across two decades, we assure you that the machine comes with ROOTS promise of quality, efficiency and performance.

We advise you to carefully read through the instructions prior to the operation of the machine. This manual contains detailed instructions for the proper operation of the machine, along with important information regarding its handling, care maintenance and service needs.

We are sure that you will find the machine and its performance to your utmost satisfaction. Once again, we thank you for choosing us as a trusted partner for your cleaning requirements.

### *Usage, Handling & Modification*

Use of the product beyond the specified scope of functioning is deemed improper and the manufacturer cannot be held liable for any damages which may arise due to this.

This machine may be used only by persons who are trained or are familiar with the machine and are aware of the possible hazards involved. The appropriate Accident Prevention Regulations as well as applicable general regulations pertaining to Safety and Health at the work place must be adhered to by the user.

Modifications made to machine without the manufacturer's consent will relieve the manufacturer of responsibility and any possible liability for consequential damage.

## *Notes on Warranty*

Refer the *Warranty Manual* supplied along with the machine.

## *Acceptance of the Machine*

On arrival of the machine at the shipping address, please check for any damage that may have occurred as a result of transit. In the event of any such damage, the purchaser is bound by responsibility to send a claim letter to the concerned authorized dealer with a copy of the invoice. The letter should be sent within 24 hours of receipt of the machine.

### **NOTE:**

**ILLUSTRATIONS SHOWN IN THIS MANUAL ARE FOR REPRESENTATIVE PURPOSE ONLY. ACTUAL PRODUCT MAY VARY.**

***ROOTS reserves the right to change the product or contents of this manual without prior information.***

***For Engine, Battery, Motors or other OEM components related kindly refer to their manufacturers manual supplied along with the machine for instructions regarding usage, maintenance and service.***

# INTRODUCTION



## ***The Manual***

All information contained is without obligation. RMCL particularly reserves the right to modify any equipment, technical specifications, colours, shapes, materials and the like so as to adapt them to local conditions all without previous announcement and without giving reasons. RMCL may stop manufacturing certain models without prior notice.

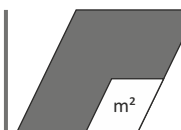
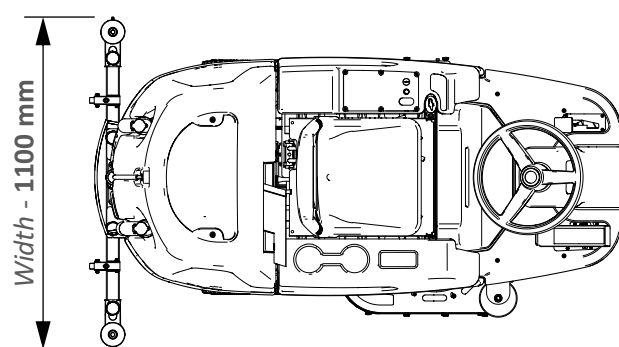
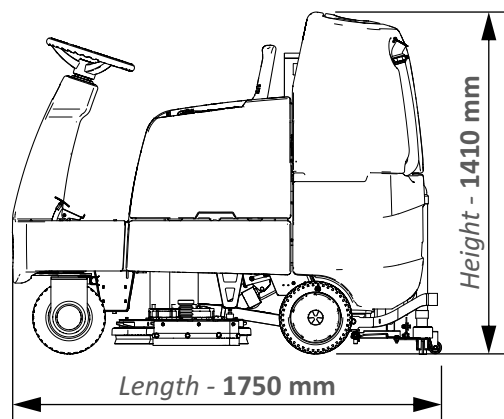
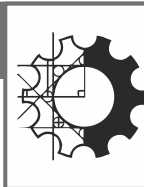
The Operator's Manual corresponds to the latest information available for this machine at the time it was printed. Minor deviations resulting from enhancements of the design cannot be entirely represented.



***Prior to first operation, read the manual carefully and strictly comply with the instructions contained.***

***The Operator's Manual is an integral part of the machine and must not be misplaced.***

# TECHNICAL SPECIFICATION - RB800



Theoretical area coverage  
- 4800 m<sup>2</sup>/h



Working speed upto - 6 km/h  
Travel speed - 6 km/h



Noise level - 69 dB



Power supply - **24 V**  
Battery rating - **24 V/200, 240, 320 Ah**  
Total power - **2400 W**  
Brush motor power - **2 X 550 W**  
Vacuum motor power - **550 W**



Drive motor power - **750 W**  
Turning radius - **1.8 m**



Vacuum pressure - **1650 mm of H<sub>2</sub>O**  
Airflow rate - **33 L/sec**



Suction width - **1100 mm**



No. of brushes per machine - **2**  
Brush diameter - **405 mm**  
Brush speed - **180 rpm**  
Scrubbing width - **800 mm**  
Brush load - **43 Kg**  
Extra brush load - **45 Kg**

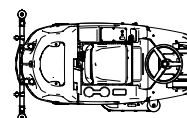


Fresh water tank - **120 L**  
Dirty water tank - **120 L**

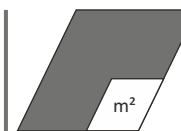
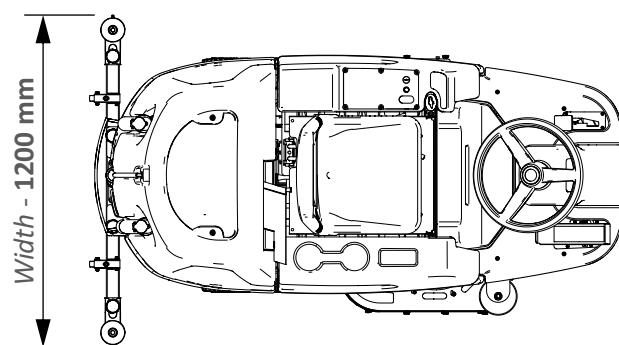
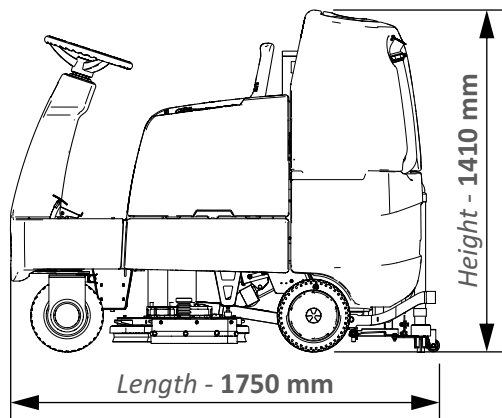
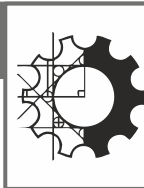


Total weight empty/w battery - **272/490 kg** for 240 Ah battery  
Total weight empty/w battery - **272/540 kg** for 320 Ah battery  
Total weight, ready to operate - **600 kg** for 240 Ah battery  
Total weight, ready to operate - **660 kg** for 320 Ah battery

Turning radius -  
**1.8m**



# TECHNICAL SPECIFICATION - RB950



Theoretical area coverage  
- 6175 m<sup>2</sup>/h



Working speed upto - 6 km/h  
Travel speed - 6 km/h



Noise level - 69 dB



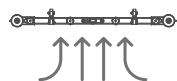
Power supply - 24 V  
Battery rating - 24 V/320 Ah  
Total power - 2400 W  
Brush motor power - 2 X 550 W  
Vacuum motor power - 550 W



Drive motor power - 750 W  
Turning radius - 1.8 m



Vacuum pressure - 1650 mm of H<sub>2</sub>O  
Airflow rate - 33 L/sec



Suction width - 1200 mm



No. of brushes per machine - 2  
Brush diameter - 485 mm  
Brush speed - 180 rpm  
Scrubbing width - 950 mm  
Brush load - 48 Kg  
Extra brush load - 50 Kg

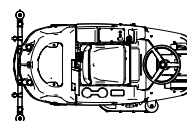


Fresh water tank - 120 L  
Dirty water tank - 120 L



Total weight empty/w battery - 272/540 kg for 320 Ah battery  
Total weight, ready to operate - 665 kg for 320 Ah battery

Turning radius -  
1.8m



## AFTER SALES SUPPORT

### CUSTOMER SUPPORT SYSTEM (CSS)

RMCL has a dedicated CSS Team to ensure prompt after sales service support. One call solution for all your complaints/concerns. Register your complaint or concern through the below toll free number for hassle free support. The customer support executive registers your complaint/concern and will keep you updated on the progress ensuring prompt closure.

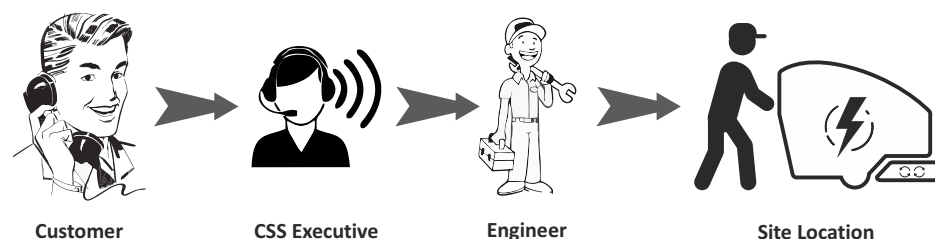
Toll Free Number:

**1800 41 99 77 9**

Our timings (Monday to Saturday):

**8:00 am to 7:00 pm**

Customer Support System Process



Our Address:

**Roots Multiclean Ltd.**

R.K.G. Industrial Estate, Ganapathy, Coimbatore - 641 006, India.

Phone: +91 (422) 4330 330.

### ANNUAL MAINTENANCE CONTRACT (AMC)



**AMC**

AMC or Annual Maintenance Contract is a professional and timely maintenance cover offered by RMCL to its customers. AMC takes care of scheduled and preventive maintenance services. Equipment under AMC qualifies for four scheduled visits and to a maximum of twelve unscheduled visits during the contract.

#### Advantages of AMC:

- ☒ **Pan India network presence.**
- ☒ **Maximum equipment uptime.**
- ☒ **Focus on your business while we take care of your equipment.**
- ☒ **Well trained engineers to take care of the equipment.**
- ☒ **System driven scheduled periodic maintenance.**
- ☒ **Genuine spare parts.**
- ☒ **Toll free number assistance for breakdown.**

### USER MANUAL



ROOTS philosophy is to continually improve all of its products. For this reason we may modify the design, appearance and engineering of our products periodically.

Therefore, some changes, modifications and improvements may not be covered in this manual.

For the latest Operator's Manual, visit:

**[www.rootsmulticlean.com/user-manual/](http://www.rootsmulticlean.com/user-manual/)**



# GENERAL SAFETY INSTRUCTIONS

## 3.1. GENERAL SAFETY SYMBOLS

All paragraphs in this manual that refer to personal safety, safety of the machine and environmental protection are attributed respective warning symbols as indicated.



**Read  
manual**

Prior to first operation, read the manual carefully and strictly comply with the instructions contained.



**Caution  
(the machine)**

Important information on handling the machine in order to maintain operability.



**Ecological hazard  
(the environment)**

Due to use of substances representing an inherent danger to health of environment.



**Safety Provisions  
(persons & goods)**

Safety provisions in dangerous situation caused by misuse inaccurate adherence of instruction or prescribed work routine.

## General Guidelines

- In addition to the information contained in this manual, generally applicable legal provisions for Safety and Prevention of accidents must be adhered to.
- Please go through the manual and the instructions contained herein carefully, even if you possess prior experience in operating similar ground cleaning equipment.
- Schedule some time for the careful and thorough perusal of the manual contents.
- The responsibility of all persons in the working area fall upon the operator of the machine.
- No persons, children included, should be allowed within the zone of danger.
- The warning and instruction plates attached to the machine carry important advice on safe operation of the machine.
- Lost or illegible stickers must be replaced at the earliest.
- Prior to operation of the machine, the operator must ensure that the machine and its working implements are in proper and safe operating condition.
- Machines with identified and known defects must not be used.
- It is important that operators and all persons likely to use the machine familiarize themselves with all accessories and controls, as well as their functions, before commencing operation.
- Adherence to the above general instructions will help avoid the operator from having to read the manual while operating the machine.

## Safety During Machine Operation

- The machine is applicable for **WET** scrubbing only.
- Ground cleaning machines may be run by qualified personnel only.
- The machine may be used for cleaning such surfaces approved by the owner or this authorized representatives.



## GENERAL SAFETY INSTRUCTIONS



- The machine is only suitable for use on the types of surfaces specified in the owner's manual.
- Protect the machine from frost or extremely low temperatures.
- Never scrub or vacuum explosive liquids, combustible / explosive dusts as well as acids and solvents! This includes diesel, petrol, kerosene, paints, paint thinners, heating oil, etc which can generate explosive fumes on contact with the suction air. Acetone, undiluted acids and aggressive solvents must not be vacuumed as it may cause damage to the machine components and brushes.
- Do not scrub/vacuum burning or glowing debris.
- Do not scrub/vacuum in flooded and slushy areas.
- This machine must not be operated by persons (including children) with limited physical ability, sensoric/mental capabilities or lack of experience, unless such persons are supervised by the person in charge.
- Children should be prevented from playing with the machine.
- The operator must use the machine properly. The operator must consider the local conditions and must pay attention to third parties especially children when operating the machine.
- Never leave the machine unattended when the motor is running.
- The operator must leave the machine only after the motor has come to a complete standstill, parking brake applied and the key has been removed.
- Prior to starting work, the operator has to check the machine's safety devices are working properly.
- The operator must wear tight fitting clothes only. The operator should wear safety shoes only when operating or while carrying out maintenance work.
- Loose fitting clothes or shoes must not be worn by the operator or any maintenance personnel who are intended to work on/with the machine.
- Check the immediate surrounding prior to starting. Ensure sufficient visibility!
- The operator must always use safety gloves, safety helmet, shoes while operating/maintaining the machine.
- On inclined/tilted surfaces, the tilt angle and the driving direction should not exceed the values given in this manual.
- Do not place any tools or metallic objects on top the battery. Risk of short circuit and deflagration!
- Smoking or naked flames are strictly prohibited.
- Always allow the machine sufficient time to cool before carrying out any repair or maintenance work.
- Ensure that there is adequate ventilation for diverting the exhaust gases/dust when operating the machine in a closed area.
- Do not place hand or any object while the brushes are running.
- Suitable tools must be used for cleaning and maintenance work.
- Do not carry out any welding, drilling, sawing or grinding work on the frame sections. Damaged parts may only be changed at an authorized service center.
- It is not permitted to use aggressive and corrosive cleaning agents.
- Used batteries with the recycling symbol must not be disposed of in household waste.
- Maintenance work may be carried out by authorised dealer only.
- Always use appropriate tool and equipments while working on the machine.
- Disconnect the battery when working on electrical system.
- Battery may only be handled and changed by properly skilled maintenance personnel.
- Pay attention that the insulation of the charger cable is not damaged and cannot be damaged during the charging process.
- The cable must not chafe against anything. In the case of defective insulation, do not use the on-board charger.
- When charging the batteries, there must be sufficient ventilation in the charging area. Otherwise, there is a risk of explosion!
- Batteries must not be connected or disconnected when conducting electricity.
- Do not use harsh chemicals to clean the machine.

## GENERAL SAFETY INSTRUCTIONS

### Spare Parts & Accessories:

#### **WARNING**

Only use accessories and spare parts which have been approved by the manufacturer. The exclusive use of original accessories and original spare parts ensures that the appliance can be operated safely and trouble free.

### Equipments With Rotating Brushes:

#### **DANGER**

- Use only brushes that are provided with the machine or specified in the Operations Manual. The use of other brushes can affect the safety of the machine.

**DANGER - Do Not Scrub Or Vacuum:**  
**Corrosive/Battery Fluids/Explosive/Flammable/  
Magnetic/Radio-active/Biohazard Materials.**



### Personal Protective Equipment (PPE):

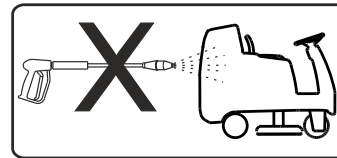
As necessary



Safety Eye Wear  
Safety Helmet  
Ear Muff  
Safety Overalls  
Safety Boots  
Safety Gloves



*This machine is not suitable for evacuation of dusts, which are explosive or dangerous to health.*



**DO NOT CLEAN THE MACHINE BY MEANS OF VAPOUR JET OR HIGH PRESSURE CLEANING EQUIPMENT.**



- Do not smoke near machine.
- Do not expose machine to open flames or burning debris.



*The machine may be used only on indoor hard floorings and for operation on level grounds with a maximum inclination of up to 10°.*







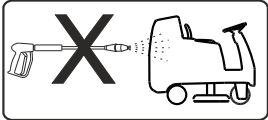

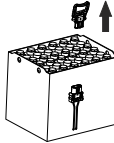





- The machine is splash-water proof (IPX3).
- This machine is not intended for use on public roads and places. Only qualified personnel must perform maintenance and repair work.
- Turn the machine off and disconnect the mains plug before cleaning and maintaining the machine, when replacing parts or when changing over to another function.



# GENERAL SAFETY INSTRUCTIONS

## SYMBOL & HAZARD PICTORIAL DEFINITIONS



 <p>Read the Operator's Manual</p>	 <p>General Warning</p>	 <p>Caution</p>	 <p>Ecological Hazard</p>	 <p>Toxic Hazard</p>
 <p>Max. Inclination</p>	 <p>Do Not Use High Pressure Jets</p>	 <p>Remove Key</p>	 <p>Unplug Battery</p>	 <p>Max. Water Wading</p>
 <p>Do Not Tamper</p>	 <p>Electrical Hazard</p>	 <p>No Smoking</p>	 <p>Recycle</p>	

## GENERAL SAFETY INSTRUCTIONS



### **ENVIRONMENTAL RESPONSIBILITY**

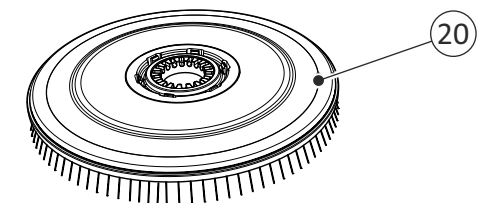
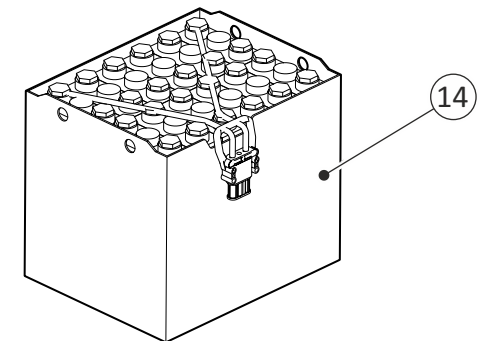
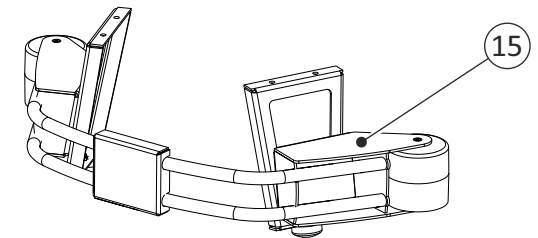
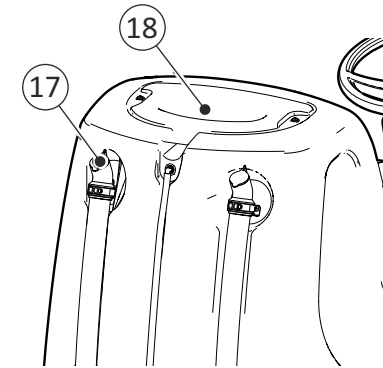
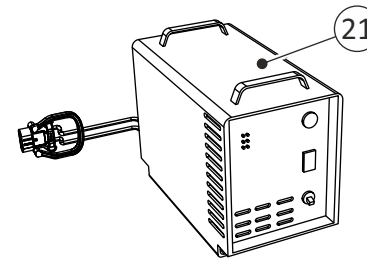
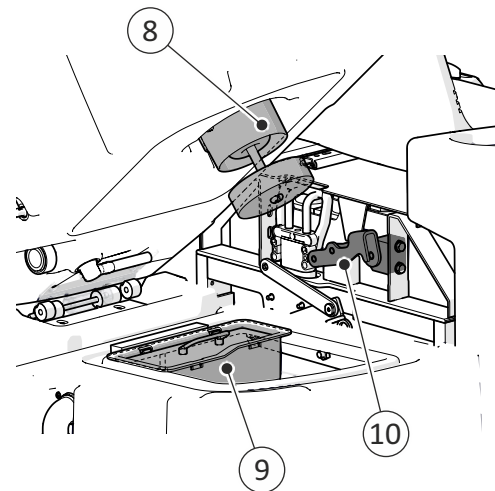
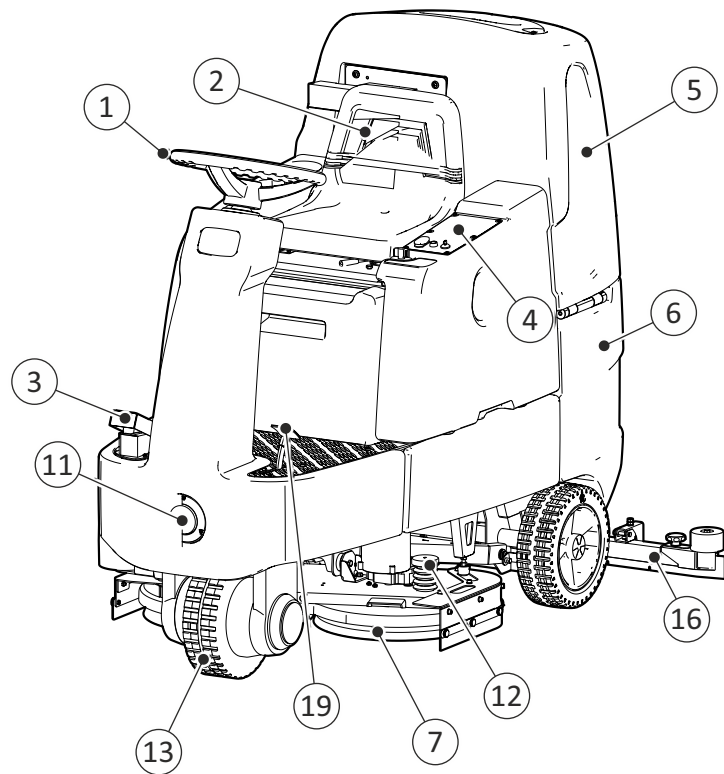


The packaging material can be recycled. Please do not place the packaging into the ordinary refuse for disposal, but arrange for the proper recycling.



Old machines contain materials that can be recycled. Please arrange for the proper recycling of old machines. Batteries and actuators contain substances that must not enter the environment. Please dispose of your old machines, batteries and actuators using appropriate collection systems.

# KNOW YOUR MACHINE



- |                      |                               |
|----------------------|-------------------------------|
| 1. Steering Wheel    | 12. Brush Release Pedal       |
| 2. Operator Seat     | 13. Traction Drive Motor      |
| 3. Accelerator Pedal | 14. Traction Battery Pack     |
| 4. Control Panel     | 15. Safety Bumper             |
| 5. Fresh Water Tank  | 16. Squeegee                  |
| 6. Dirty Water Tank  | 17. Drain Hoses               |
| 7. Brush Head        | 18. Fresh Water Fill Port     |
| 8. Float             | 19. Brake Pedal               |
| 9. Debris Tray       | 20. Brush                     |
| 10. Tank Lock        | 21. Off-Board Battery Charger |
| 11. Headlamp         |                               |

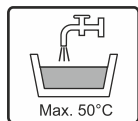
## DECALS ON THE MACHINE



These labels appear on the machine in the locations indicated. If any label becomes damaged or illegible, install a new label in its place.



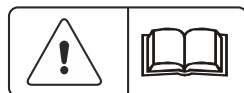
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(2)



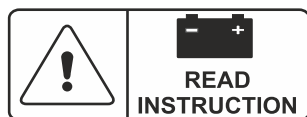
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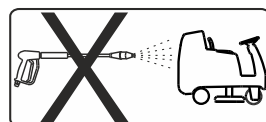
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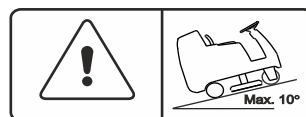
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(6)



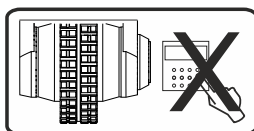
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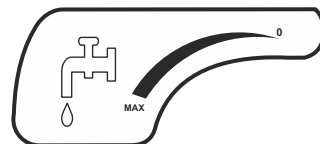
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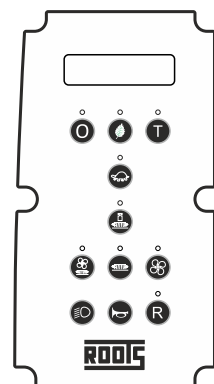
(9)



(10)



(11)



(12)

1. Roots - Silvergrey
2. Fresh Water Filling
3. Remove Key
4. Read Instruction Manual
5. Hand Crush Warning
6. Read Battery Instruction
7. Do Not Wash With High Pressure
8. Max Inclination
9. Battery Charging Instruction
10. Do Not Tamper Drive Motor Controller
11. Fresh Water Flow Control
12. Control Panel Sticker

# MACHINE OPERATION



## 12.1 Machine Operation:

It is the operator's responsibility to be knowledgeable of all potential operating hazards and to take every reasonable precaution to ensure oneself, others, animals, and property are not injured or damaged by the machine

This section of the Operator's Manual is designed to familiarize, instruct, and educate safe and proper machine use to the operator. The operator must be familiar with the machine operation and all associated safety practices before operating.

Proper operation of the machine, as detailed in this manual, will help ensure years of safe and satisfactory use of the machine. **READ, UNDERSTAND, and FOLLOW** the safety messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the safety messages. Always use good common sense to avoid hazards.



### WARNING

**Do not operate a damaged or malfunctioning machine. Risk of equipment failure or cause of injury or death or damage to property.**

### 12.1.1 Operator Requirements:

Only qualified people are allowed to operate the machine. A qualified operator has read and understood the owner's manual and should comply with its procedures. If any part of the operation and safe use of this equipment is not completely understood, consult an authorized dealer for a complete explanation.

If the operator cannot read the manuals for themselves or does not completely understand the operation of the equipment, it is the responsibility of the supervisor to read and explain the manuals, safety practices, and operating instructions to the operator.

### 12.1.2 Employer Responsibilities:

- a. Train the employee to operate the machine in a safe way.
- B. Permit only qualified personnel to operate and service the machine.
- c. Instruct all operators to maintain the shields and guards in its proper working condition at all times.
- d. Ensure that the operators use approved Personal Protective Equipment at all times or whenever required.
- e. Forbid the operators to carry additional people on the truck or the machine.
- f. Ensure that nobody including the operator modifies or alters the machine or any of its function, doing so may cause fatal injury or death or it may damage the machine itself.
- g. Ensure that children do not operate the machine.

### 12.1.3 Before Starting the Machine:

Before operating the machine, ensure that the equipment is working properly and that you are prepared for vacuuming operations by checking the Pre-operative checklist and testing the machine operations.



## MACHINE OPERATION



### UNLOADING

The machine and battery are shipped in a packed condition to the customer's place.

**To unpack the machine follow the below steps:**

#### **NOTE:**

Machine and Battery are packed separately.

#### **Machine unloading**

- Remove the packing crates from the sides and the top.
- Remove the squeegee from its packing position.
- Remove the brush box.
- Install the ramps on the rear of the pallet.
- Remove the J Hooks from the front and rear wheels.
- Remove the retaining straps from the front, rear and brush head areas.
- Remove the wheel blocks.
- Disengage the parking brake.
- Push the machine backwards slowly down the ramp.
- Park the machine on a flat solid ground.
- The Operator's manual is packed along with the machine.

#### **Battery unpacking and installation**

- Remove the packing from the top side by removing the packing straps.
- Hoist the battery using appropriate lifting equipment.
- Tilt the seat of the machine.
- Remove the door assembly.
- Place the battery on the machine.
- Plug the battery terminals to the machine.
- Install the door assembly back in position and lower the seat.
- Now the machine is ready to use.

### **After unloading**

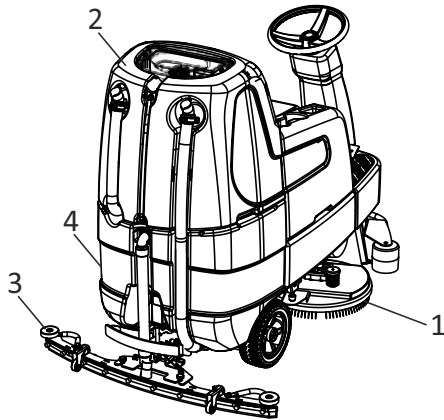
Verify the machine and accessories with the invoice copy. Check the machine for any transit damage, if found contact the branch/dealer immediately.

 **Owner's personnel are not allowed to unpack the machine.**

# MACHINE OPERATION

## WORKING PRINCIPLE

A squeegee and suitable brushes or pads are required for wet cleaning of hard floorings. The rotating brushes (1) scrubs the floor thoroughly, removing dirt, by cleaning agent supplied from the fresh water tank (2) thereby cleaning the floor. The soiled water is drawn during the same cycle through the squeegee (3) and fed into the dirty water tank (4). Thus, the floor can be walked on immediately after it is dry and clean.



## Useful Tips

- Prior to wet cleaning, it is necessary to clean the floor. This way, not only is the cleaning efficiency improved, but wear of the brush is also substantially reduced.
- If floors are particularly dirty or if wax has to be removed (basic cleaning); the floor must be treated twice.
- During the first cycle, the floor is scrubbed with the cleaning agent selected according to the degree of dirt encountered, the squeegee remaining lifted.
- Allow the cleaning agent to act on the floor for approx. 5 or 10 minutes, complying with the manufacturer's instructions.
- Scrub the floor once again while the squeegee is lowered.
- Too much foam indicates excessive dosage or improper suitability of detergent for the existing kind of dirt.

- Detergent particles contained in the soiled water that are not used will cause formation of foam.
- Instructions for dosage are given on the detergent tank and must ideally adhere to manufacturer's recommendations.
- The ideal type of detergent and the perfect dosage applicable to it will come through sustained use of the machine.

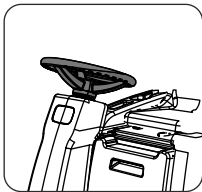
### NOTE:

*Comply with instructions for correct dosage of detergent. Correct dosage will help optimize costs and also minimize impact on the environment. Too much foam can affect the performance of the machine.*

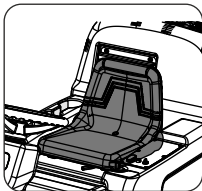


# MACHINE OPERATION

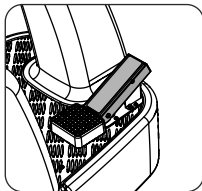
## OPERATING AND INDICATOR ELEMENTS



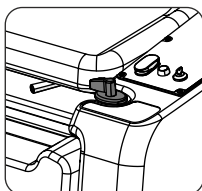
- 1. Steering Wheel-**  
Used to steer the machine.



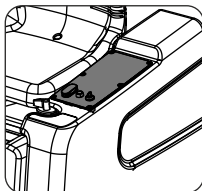
- 2. Operator's seat**  
Adjust the driver's seat longitudinally as follows:  
- Push lever to the side and displace the seat as required, then let the lever catch into place again.



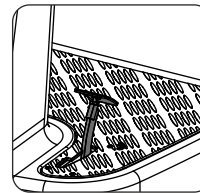
- 3. Accelerator Pedal**  
Used to propel the machine forward or backwards.



- 4. Water Flow Control**  
Used to change the water flow from minimum to maximum.



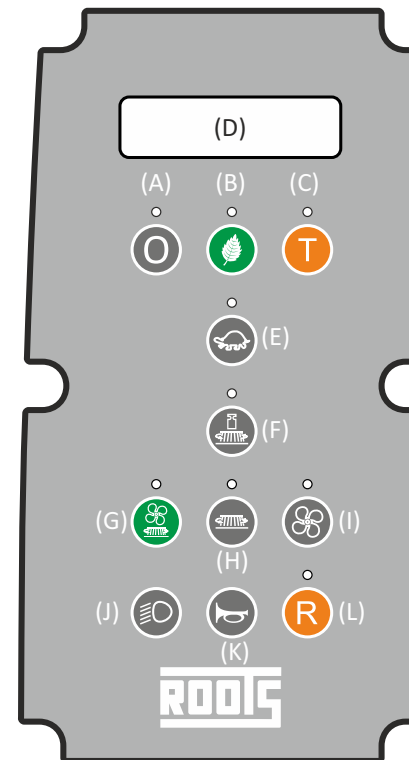
- 5. Control Panel-**  
Houses all the controls of the machine.



- 6. Brake Pedal**  
Used to slow/stop the machine.

### Control panel switches in detail -

Type A - Standard version



- A. Optional Switch
- B. ECO Mode
- C. Transport Mode
- D. Display
- E. Slow Speed
- F. Extra Pressure
- G. All in One mode Switch
- H. Brush Motor (On/Off)
- I. Vacuum Motor (On/Off)
- J. Head Lamp (On/Off)
- K. Horn
- L. Reverse Mode
- M. Key Switch
- N. Emergency Stop Switch



# MACHINE OPERATION

## OPERATING AND INDICATOR ELEMENTS



### A. Optional Switch -

This switch can be programmed for any custom function.



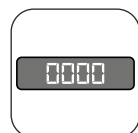
### B. ECO Mode -

Reduces the power to the Vacuum Motor & Brush Motor for a quieter operation and to extend the battery range.



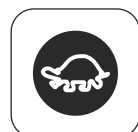
### C. Transport Mode -

In this mode only the drive motor functions, all other machine functions are disabled.



### D. Display -

The LCD screen displays all the necessary machine functions, including error codes, total hours the machine has been used.



### E. Speed Setting -

This switch is used to reduce the drive motor speed below its set value.



### F. Extra Pressure -

Used to increase the brush pressure on the floor during cleaning a heavily soiled area.



### G. AUTO Mode -

The AUTO mode switch when pressed, activates all the machine functions simultaneously.



### H. Brush Motor Switch -

Used to ON/OFF the brush motor.



### I. Suction Turbine Switch -

Used to ON/OFF the suction turbine.



### J. Headlamp Switch -

Used to ON/OFF the headlamp.



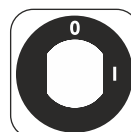
### K. Horn Switch -

Used to activate the horn.



### L. Reverse Mode Switch -

Used to activate the reverse function of the drive motor.



### M. Key Switch-

Turns the electrical system On/Off.



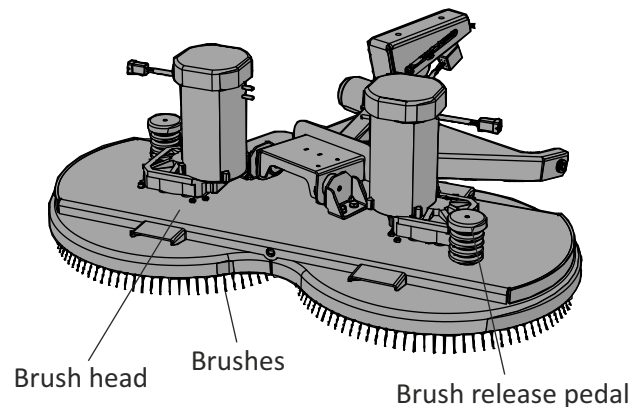
### N. Emergency Stop Switch-

Turns the machine Off in case of an emergency.



# MACHINE OPERATION

## Disc Brush Head



### Cleaning the disc brushes

Clean the disc brushes on the brush head daily or as necessary.

1. Raise the brush head.
2. Press the brush release pedal downwards and remove the disc brushes to clean them.



**Do not use harsh acids or chemicals to clean the disc brushes.**

### Installation of disc brushes

Check the disc brushes on the brush head weekly for signs of wear. In case of wear the disc brushes must be changed.

1. Raise the brush head.
2. Press the brush release pedal downward and remove the disc brushes.
3. Slide a new disc brush under the brush head and press it into the catch using both hands.



**Switch off machine before changing brushes.**

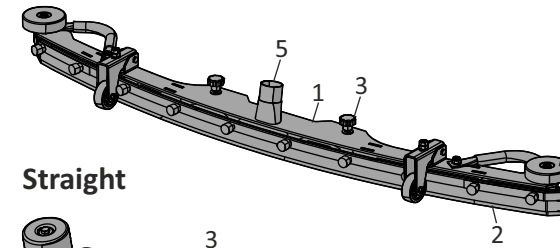
**Care should be taken while mounting brushes.**

**Do not stand on the brush head.**

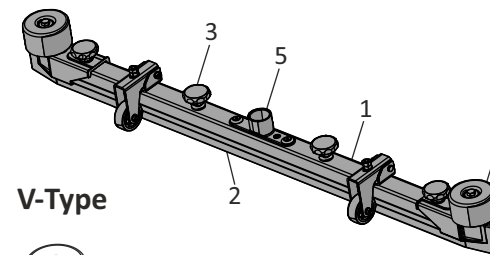
## Squeegee

The squeegee is used to extract the dirty water from the floor.

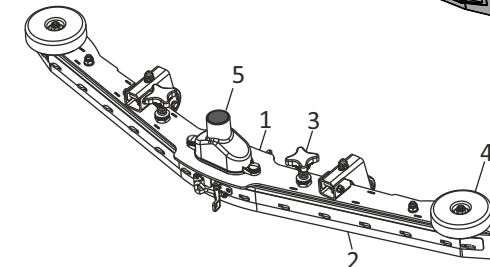
### Parabolic



### Straight



### V-Type



1. Squeegee base
2. Squeegee lip
3. Knob
4. Deflector roller
5. Suction port

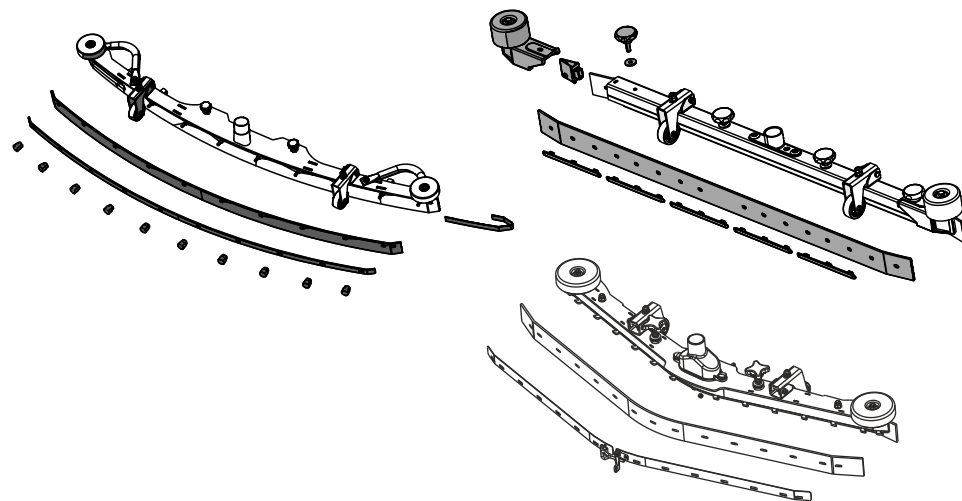
### Replacement of squeegee lips


Check the inner and outer lips on the squeegee daily for signs of wear. The lips can be used four times by flipping it 90° and reused.

1. Raise the squeegee.
2. Pull the suction hose from the squeegee, unscrew the knobs and remove the squeegee.
3. Loosen the fastening knobs/strips and remove the lip. Turn or replace the lip if necessary. Follow the same for the inner lip also.



# MACHINE OPERATION



 **Clean the squeegee before starting the work cycle every time.**  
**Do not stand on the squeegee.**

## Cleaning the squeegee

Check the squeegee daily and clean as necessary.

To clean the squeegee, raise it, disconnect it from the suction hose, loosen the knobs and remove the squeegee.

Wash the squeegee under clean running water.

## Driving the machine

The machine is powered by a powerful traction motor.

### Starting-

To propel the machine press the accelerator pedal in downward direction.


### Stopping-

To stop or slow the machine release the accelerator pedal (Pedal returns to its initial position). Press the brake pedal to slow or stop the machine.

Proceed to the first driving trials on a clear training ground until the driver is acquainted with the elements and their functions.

- Before leaving the machine make sure to remove the key.
- Because of skidding hazard drive at reduced speed on wet grounds and when turning.
- Drive slowly on downhill, turning, wet grounds, ramps and on uneven surfaces.
- Do not drive the machine in flooded areas. Risk of damaging the traction motor.
- Never make sharp maneuvers while driving.
- Do not adjust the seat while driving the machine.



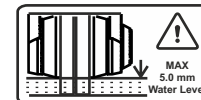
 **Do not modify the machine to transport people or goods.**  
**Do not drive fast with the tanks full of water.**



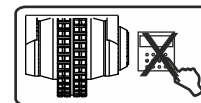
**Do not park the machine on slopes or ramps.**



**Maximum inclination of 10° is only allowed.**

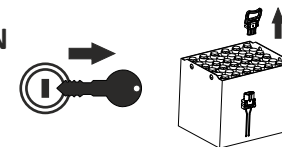


**Maximum water wading of 5.0 mm is allowed.**



**Do not tamper the traction motor controller.**  
**Risk of damaging the motor.**

**MALFUNCTION  
OR  
EMERGENCY**



**In case of an emergency or malfunction - switch of key and disconnect battery plug.**

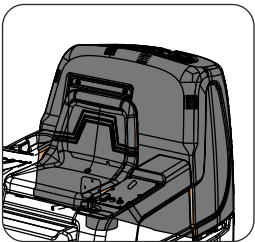
# MACHINE OPERATION

## Start of cleaning

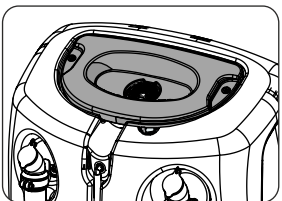
- To fill clean water in the fresh water tank insert the water hose into the fill port.
- Add required amount of recommended cleaning agents to the water.
- Move the machine to the area to be cleaned.
- Switch on key "M".
- Press "A" to activate the water solenoid.
- Press "H" to lower the brush head - brush head lowers and brushes rotate.
- Press "I" to start suction turbine - suction turbine starts and squeegee lowers.
- Drive immediately or the brushes will leave traces on the floor.
- Commence cleaning operation of the area.
- Use switch "N" in case of an emergency.
- Use switch "B" to activate **ECO** mode if power conservation is required.

## DIRTY AND FRESH WATER TANKS

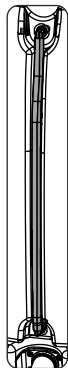
### Fresh Water Tank



The fresh water tank has a capacity of 120 liters of water.

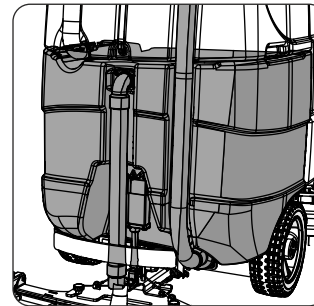


Place the water hose into the fill port to filter and fill the tank.  
Do not fill water beyond a temperature of 50°C.

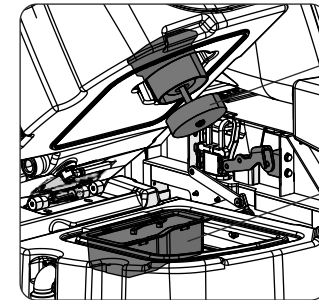


Fresh water tank indicator hose.

### Dirty Water Tank

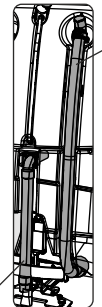


The dirty water tank has a capacity of 120 liters.



Float

Collection Tray



Drain Hose

Suction Hose

## End of cleaning

- Press "H" to switch off brush head.
- Press "A" to switch off the water solenoid.
- Run the machine to collect the remaining water.
- Press "I" to switch off suction turbine and raise squeegee.
- Drive the machine to the waste disposal area.
- Unhook the drain hose and dump the dirty water to the drain.



**Do not drain the soiled water into the environment.**

- Remove the collection tray and clean with fresh water.
- Clean the dirty water tank with clean water.



# MACHINE OPERATION

## End of cleaning



**- Do not clean the machine by means of a vapor jet or a high pressure cleaning equipment. Clean the brush head with a water hose (pressure: 5 to 6 bar max.) and from the bottom only.**



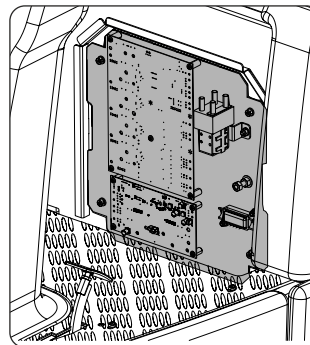
**- Do not direct the water jet into any opening, slots, on electronic modules, control panels or sealing.**

**- Do not use harsh chemicals to clean the machine.**

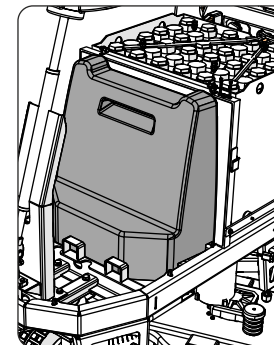
**- Wipe the machine with a damp cloth after usage.**

Remove the squeegee from the machine and clean the lips before the next operation.

## Electrical System



Main control module



Cover electrical module

The electrical system houses the main control module and the traction motor controller.



- Do not open the cover of the electrical module.**
- Remove key before carrying out any electrical work.**
- During battery top up ensure that the cover electrical module is closed securely.**
- Never open the cover electrical module in dusty areas.**
- DO NOT TAMPER WITH THE ELECTRICAL MODULE OR THE CONTROLLER.**
- Do not dispose the replaced electrical/electronic components in to the environment.**







## Service Display

The hour meter holds the service display. Upon turning on the following are successively displayed:-

- software version is displayed	- battery type is displayed	- total operated hours is displayed
V 02	LA	0000

## Error Codes

(For RMCL Service Engineers reference only)

Error Code	Error Description	Remedy
E01	Fuse Blown	Self Explanatory
E03	A2 TOP Error	Self Explanatory
E04	No CAN communication Brush Actuator Overload	Self Explanatory
E10	Release Accelerator Pedal	Self Explanatory
E12	Drive Motor Over Load	Self Explanatory
E13	Over Voltage	Self Explanatory
E14	Seat/Brake Switch Open	Check Switches/Wire loops are properly connected.
E15	Safety Drive Switch Not Neutral	Self Explanatory
E16	Charge the Battery	Self Explanatory
E18	Motor Parameter Check Sum Mismatch	Settings menu has been reset to 'Zero' accidentally.
E19	SD Card Unavailable	Self Explanatory
E20	SD Card fail	Self Explanatory

# MAINTENANCE

## Maintenance Work

Compliance with our recommendations concerning maintenance work will give you the certitude always having a machine at your disposal, which is ready to work and in good operating condition. Please contact your local distributor; the people there will be glad to perform that work for you.

- Well trained personnel and genuine spare parts are at your disposal.
- In case of any inquiries or orders for spare parts, please always quote the machine's serial number mentioned on the nameplate.
- The name plate is fixed in the rear side of the machine.
- When cleaning or servicing the machine, and when replacing any parts, shut off the machine and on principle disconnect the power plug from the power supply.
- For reasons of safety during cleaning and/or maintenance work in or on the tank, the tank lid - when lifted - must be secured so as to prevent accidental closing or tilting down.
- The machine may be taken into operation only if all guarding devices are fitted and in protective position. As far as possible, cleaning should not be done by hand, but using appropriate tools or equipment.
- Maintenance and repair work may be carried out only by means of suitable tools and by the people trained in the factory - for reasons of safety, only genuine spare parts may be used.

## Greasing Points



Greasing point

## Maintenance Schedule

Maintenance Table	Service Hours			
	daily	every 50	every 200	every 500
Recharge batteries according to charger unit instructions	●			
Empty and clean dirty water tank	●			
Check condition of squeegee lips	●			
Check squeegee for foreign particles taken and clean if required	●			
Clean filter in fresh water tank	●			
Check battery poles and apply grease if required	●			
Check tight fitting and condition of suction hose between squeegee and dirty water tank		●		
Check squeegee lips for wear and turn or replace if required		●		
Check brushes and water retaining ring for tight fitting and condition and replace if required		●		
Check function of float		●		
Check rotational direction of the brushes		●		
Check function of brake		●		
Check squeegee holder and castor roller, re-adjust if required			●	
Check fresh water supply to the brushes		●		
Clean traction motor from carbon dust and check the accessible carbon brushes for smooth running and condition, replace if required				●
Clean electro-motor from carbon dust and check the accessible carbon brushes for smooth running and condition, replace if required				●
Grease steering pinion and gear ring				●
Check joints at squeegee holder and grease if required				●



# TROUBLESHOOTING



Problem	Cause	Remedy
<i>No power - nothing works</i>	Faulty power switch	Contact service
	Battery need to be recharged	Recharge battery
	Faulty battery	Replace battery
	Loose battery cable	Tighten loose cable
	Main fuse blown	Rectify the cause & Replace the fuse
<i>Brush motor does not work</i>	Accelerator pedal is not depressed	Depress accelerator pedal
	Main fuse blown	Rectify the cause & Replace the fuse
	Faulty brush motor or loose cable	Contact Roots service
<i>Suction turbine does not work</i>	Faulty suction turbine switch	Replace switch
	Suction turbine fuse blown	Replace the fuse
	Faulty suction turbine	Contact Roots service
	Carbon brushes worn	Contact Roots service
<i>Insufficient water flow</i>	Water tank low	Refill fresh water
	Flow lever turned to stop	Turn lever more to open
	Water line clogged	Remove and blow with compressed air
	Water valve clogged	Remove and clean
<i>Poor water recovery</i>	Dirty water tank is full	Empty dirty water tank
	Suction hose is clogged	Remove debris
	Squeegee is clogged	Remove debris
	Squeegee lip is worn	Rotate or replace lips
	Faulty vacuum hose	Contact service

Problem	Cause	Remedy
<i>Poor water recovery</i>	Tank gasket faulty	Contact service
	Drain hose leak	Hook up drain hose and close
	Suction turbine faulty	Contact service
<i>Tires noisy</i>	Battery charge low	Recharge battery
	Bearing dry	Grease bearings
	Faulty hubs	Contact service
<i>Poor traction</i>	Excessive brush pressure	Reduce pressure
	Worn traction tire	Replace tire
	Heavy soap concentration	Contact service
<i>Short run time</i>	Battery run down	Charge battery twice
	Battery still down	Contact service
	Battery low on water	Refill with distilled water
	Battery over cycled	Contact service

## DO'S & DON'TS



### Do's

- ✓ Charge the batteries after it has been completely discharged.
- ✓ Charge the batteries only in a well ventilated area.
- ✓ Use only clean water to fill the fresh tank.
- ✓ Fill fresh water till the marked level only.
- ✓ Clean the fresh water filter after each cleaning cycle.
- ✓ Empty the dirty water at a specified draining area.
- ✓ Clean the dirty water tank and collection tray after each cleaning cycle.
- ✓ Clean the suction float assembly if any dirt is noticed.
- ✓ Clean the squeegee after every cleaning cycle.
- ✓ Use only recommend cleaning solutions.
- ✓ Wipe the machine at the end of the day.
- ✓ Drive at a slow speed on ramps and uneven surfaces.
- ✓ Use only recommended brushes for the specified floors.
- ✓ Park the machine in a covered dry place.

### Don'ts

- ✗ Do not charge the batteries between cleaning cycle.
- ✗ Do not use the machine for transporting goods or persons.
- ✗ Do not modify the machine.
- ✗ Do not fill water beyond 50°C.
- ✗ Do not use harsh or acidic solutions.
- ✗ Do not empty the dirty water in a habitable area.
- ✗ Do not drive with the fresh water tank open.
- ✗ Do not stand on the brush head and squeegee.
- ✗ Do not park the machine on ramps or slopes.
- ✗ Do not place any objects on the battery while charging.
- ✗ DO NOT TAMPER WITH THE ELECTRICAL CIRCUITS.
- ✗ Do not open the electrical module cover.
- ✗ Do not adjust the drive motor controller.
- ✗ Do not clean the machine with a high pressure cleaning system.
- ✗ Do not abuse the machine beyond its operable limit.
- ✗ Do not mix brushes and use.
- ✗ Do not park the machine by exposing it to the natural elements.
- ✗ Do not use the machine to tow or push other equipments.
- ✗ Do not over fill the distilled water in the battery.

# BATTERY SYSTEM

## Before using the machine

### Battery plug coding

All battery plugs at machines, batteries and battery charger units have to be coded with the colored coding pins according to the battery type and the charger unit plugs are/will be seteristic curve such that a modification of the curve (in relation to the battery type) requires changing of the plug coding nominal voltage.

### Plug case of charger units :

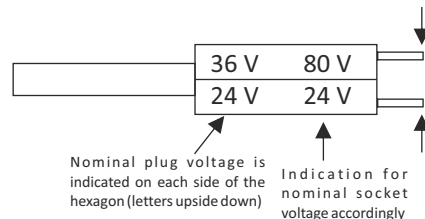
Grey for fluid-filled batteries, Green for maintenance-free Gel batteries

### Plug case of machine :

Yellow for both battery types

Socket case of battery: Grey for fluid-filled batteries :

Green for maintenance-free



Replace the coding plugs by pressing the ends together with pliers.

### Press together for removal

Insert coding plug such that the nominal voltage inscription is visible through the case window. Socket and plug only with the same nominal voltage. The following three conditions have to be met:

- 1) Voltage coding must be the same for all sockets and plugs.
- 2) Coding pin colour in the machine = yellow
- 3) Coding pin colour in the charger unit = the same as for the battery plug according to battery type.



**Open the seat console of the machine before performing charging operations.**

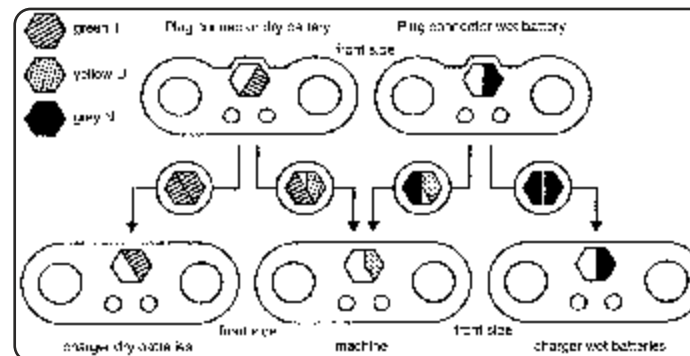


**Before first operation of the machine, fully charge the battery with an initial charging procedure and comply with the operating instructions of the charger as well as with those of the battery manufacturer. Roots cannot be held liable for damages resulting from the fact that the initial charging has not or insufficiently been done.**



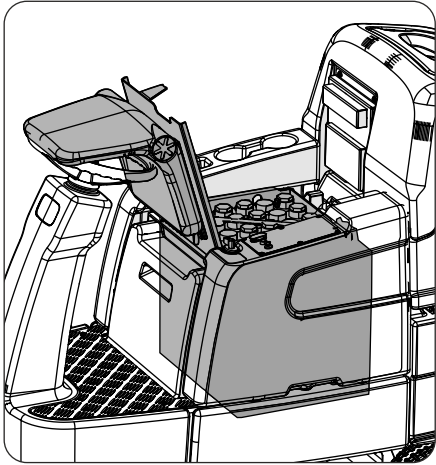
## Coding system in the charger unit for fluid-filled batteries

### Example 24V Battery System



# BATTERY SYSTEM

## Charging Procedure for Traction Block Batteries



- Drain both the tanks
- Move machine near charger location
- Switch Off Key
- Remove key
- Tilt operator seat forward completely
- Disconnect the battery plugs and connect them to the charger supplied with the machine.

**- Make sure to connect the charger to the specified voltage and frequency.**



- Ensure that the seat cover is completely open.**
- Do not place any objects on the battery.**



**Charge the batteries in a well ventilated area.  
Do not tamper with the charger settings.**

## Safety Symbols for Traction Battery System



*The above instructions have been established for your safety and have to be strictly observed.*



**-Observe the instruction which must be mounted clearly at the charging point!**



**-No Smoking!  
-No naked lights, embers or sparks in the vicinity, risk of fire and explosion!**



**-Wear protective goggles and protective clothing when working on the batteries!**



**-Do not tilt the battery!  
-Only use certified hoisting and transport equipment.**



**-Keep children away from batteries**



**-Any splashes of acid in the eyes or on the skin must be rinsed thoroughly with plenty of clear pure water.  
-Then consult a doctor immediately!**

# BATTERY SYSTEM



- Risk of fire explosion, avoid short circuits!
- Caution! Metal components in the battery cells are always under voltage, never place any foreign items or tools on the battery!



- Electrolyte is highly corrosive!



- Charge in a well-ventilated area



- Do not throw in garbage!

## Traction Batteries (LA)

### 1. Initial Checking-

Check the battery to ensure that it is in perfect mechanical condition. All screwed unions within the circuit must be tightened to ensure reliable contacts. Machine cables and charging cable are to be connected to the correct poles of the battery otherwise battery and charger can be damaged.

### 2. Discharging-

Ventilation openings may not be covered or closed. Electric connections (e.g. plugs) may be connected or disconnected only when the machine is in off condition. Discharge batteries must be recharged immediately and may not remain in discharged condition. This also applies to only partially discharged batteries.

The battery may only be connected up to the allocated battery charger certified for the particular battery size, to avoid overload on the electric current. Maintenance Free Batteries have low gassing properties but are not completely free of gassing. The battery is to be connected with the correct poles (plus to plus and minus to minus) to the disconnected battery charger. The battery charger should then be switched on.

During the recharging procedure, the temperature in the battery increases by approx. 10 °C. For this reason, the recharging procedure may not be started unless the temperature is below 35 °C.

Before recharging the battery, the temperature should be at least 15 °C, otherwise the battery will not be correctly.

If the temperatures are constantly greater than 40 °C or lower than 15 °C, temperature-dependent constant voltage regulation of the battery charger will be necessary.

### 3. Temperature-

The battery temperature of 30 °C is rated temperature. Higher temperatures shorten the service life and lower temperatures reduce available capacity. 45 °C (51 °C for AGM) is the limit temperature and is not tolerable as operating temperature.

### 4. Electrolyte-

The electrolyte is sulphuric acid. The density of the electrolyte cannot be measured. Use the recommended electrolyte to top up.

### 5. Maintenance-

Daily maintenance- Recharge the battery every time it has been discharged.

Weekly maintenance- Visual inspection after recharging for signs of dirt and mechanical damage.

Maintenance to be carried out every three months

After fully recharging and following a standing period of at least 5 hours, the following must be measured and Recorded: – total voltage / – individual voltage

If noticeable changes are detected compared to previous measurements, or differences between the cells or block batteries, the customer service should be called for testing or repair.

### 6. Care-

The battery must be kept clean and dry to prevent creeping current. Any liquid in the battery container must be extracted and disposed of according to regulations.

# BATTERY SYSTEM

## 7. Storage-

If batteries are out of operation for longer periods, they should be stored in fully charged state in a dry, frost free room.

In order to ensure that the battery is ready for operation at any time, it can be recharged according to one of the following methods:

1. Full recharge every three months. When a consumer is connected up (e.g. measuring or controlling devices), it may be necessary to recharge the battery every two weeks.
2. Maintenance recharging at a recharging voltage of  $2.25 \text{ V} \times \text{number of cells}$ . The storage period is to be taken into account for the service life.

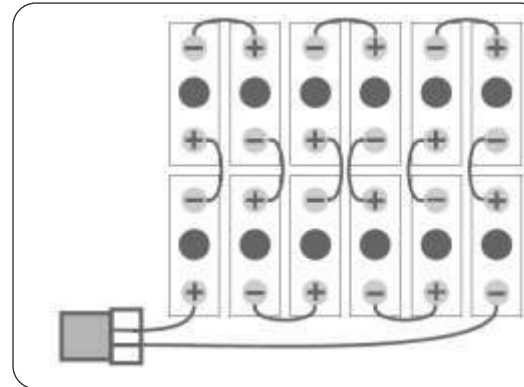
## 8. Faults-

The customer service should be called immediately when any faults are discovered in battery or battery charger.

### Lead Acid (LA) Battery Instructions

- Kindly ensure that the Warranty certificate of the battery is available at your end.
- Kindly read the Do's & Don't's of the battery, understand and follow.
- Check the electrolyte level before charging and top it up with battery grade distilled water if required.
- Match the battery to the correct charger.
- Keep the battery well ventilated while charging.
- Charge the battery immediately after it is discharged completely.
- Keep all inter cell connections and bolted terminals tight and covered with petroleum jelly.

### Battery Connection Diagram



### Battery and Charger Specification

#### Battery:

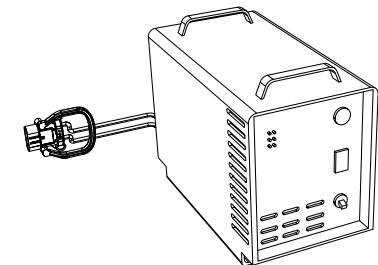
Type: Traction block battery

Rating: 24V, DC, 200Ah, 240Ah, 320Ah

#### Charger:

Type: Off-board

Rating: 230V, AC, 50-60Hz, 30Amps



### Disposal of Batteries

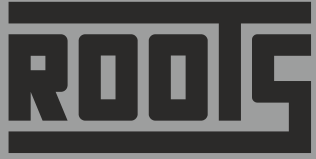


Old batteries with this sign are recyclable economic goods and should be brought back into the recycling process.

Old batteries which are not brought back into the recycling process, have to be dealt with as dangerous materials under the observance of all regulations.







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