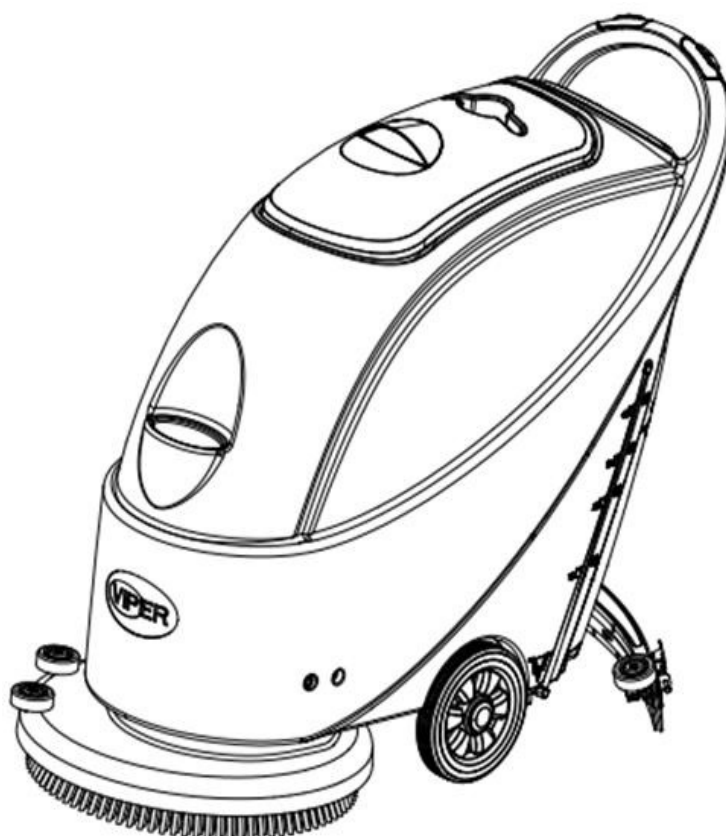




# Scrubber User Manual

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AS430B & AS510B



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VF90012-AU  
Rev.04  
25 Apr. 2024

## TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	<b>2</b>
MANUAL PURPOSE AND CONTENTS . . . . .	2
TARGET . . . . .	2
HOW TO KEEP THIS MANUAL . . . . .	2
DECLARATION OF CONFORMITY . . . . .	2
IDENTIFICATION DATA . . . . .	2
OTHER REFERENCE MANUALS . . . . .	2
SPARE PARTS AND MAINTENANCE . . . . .	2
CHANGES AND IMPROVEMENTS . . . . .	2
UNPACKING/TRANSPORT . . . . .	2
OPERATION CAPABILITIES . . . . .	3
CONVENTIONS . . . . .	3
UNPACKING/DELIVERY . . . . .	3
SAFETY. . . . .	3
VISIBLE SYMBOLS ON THE MACHINE . . . . .	3
SYMBOLS THAT APPEAR ON THIS MANUAL . . . . .	4
GENERAL INSTRUCTIONS. . . . .	4
TECHNICAL DATA . . . . .	6
<b>MACHINE DESCRIPTION</b> .....	<b>6</b>
MACHINE STRUCTURE . . . . .	6
CONTROL PANEL . . . . .	7
DISPLAY WINDOW OF CHARGER INDICATION LIGHT . . . . .	8
<b>GUIDE FOR USE</b> .....	<b>8</b>
INSTALLING AND SETTING THE BATTERY OF THE NEW MACHINE . . . . .	8
INSTALLING BATTERY AND SETTING BATTERY TYPE (WET OR GEL/AGM) . . . . .	9
BEFORE MACHINE START-UP . . . . .	11
INSTALLING AND UNLOADING THE BRUSH / PAD-HOLDER . . . . .	11
ADJUSTING THE BALANCE OF THE SQUEEGEE . . . . .	12
REGULATING THE VOLUME OF WATER FLOW . . . . .	12
MACHINE START AND STOP . . . . .	12
MACHINE OPERATION (SCRUBBING AND DRYING) . . . . .	13
TANK EMPTYING . . . . .	14
AFTER USING THE MACHINE . . . . .	15
PERIODS OF INACTIVITY . . . . .	15
USING FOR THE FIRST TIME . . . . .	15
<b>MAINTENANCE AND CARE</b> .....	<b>15</b>
SCHEDULED MAINTENANCE TABLE . . . . .	16
BATTERY CHARGING . . . . .	16
SQUEEGEE CLEANING . . . . .	17
SQUEEGEE BLADE CHECK AND REPLACEMENT . . . . .	17
BRUSH/POLISHING PAD CLEANING . . . . .	18
WATER TANK AND FLOAT FILTER MESH CLEANING . . . . .	18
SOLUTION FILTER CLEANING . . . . .	19
CIRCUIT FIGURE OF AS430B AND AS510B . . . . .	20
<b>TROUBLESHOOTING</b> .....	<b>21</b>
<b>MACHINE DISPOSAL</b> .....	<b>21</b>

## INTRODUCTION



### NOTE

The numbers in brackets refer to the components shown in Machine Description chapter.

## MANUAL PURPOSE AND CONTENTS

The purpose of this Manual is to provide the operator with all necessary information to use the machine properly, in a safe and autonomous way. It contains information about technical data, safety, operation, storage, maintenance, spare parts and disposal. Before performing any procedure on the machine, the operators and qualified technicians must read this Manual carefully. Contact Nilfisk in case of doubts concerning the interpretation of the instructions and for any further information.

### TARGET

This Manual is intended for operators and technicians qualified to perform the machine maintenance.

The operators must not perform procedures reserved for qualified technicians. Nilfisk will not be answerable for damages coming from the non-observance of this prohibition.

## HOW TO KEEP THIS MANUAL

The Instructions for use Manual must be kept near the machine, inside an adequate case, away from liquids and other substances that can cause damage to it.

## DECLARATION OF CONFORMITY

The Declaration of Conformity, supplied with the machine, certifies the machine conformity with the law in force.



### NOTE

Two copies of the original declaration of conformity are provided together with the machine documentation.

## IDENTIFICATION DATA

The machine serial number and model name are marked on the plate (4).

Product number and year of production are marked on the same plate.

This information is useful when requiring machine spare parts. Use the following table to write down the machine identification data.

MACHINE model
PRODUCT code
MACHINE serial number

## OTHER REFERENCE MANUALS

- Electronic battery charger Manual, to be considered as integral part of this Manual
- Spare Parts List (supplied with the machine)
- Service Manual (that can be consulted at Nilfisk Service Centers)

## SPARE PARTS AND MAINTENANCE

All necessary operating, maintenance and repair procedures must be performed by qualified personnel or by Nilfisk Service Centers. Only original spare parts and accessories must be used.

Contact Nilfisk for service or to order spare parts and accessories, specifying the machine model, product code and serial number.

## CHANGES AND IMPROVEMENTS

Nilfisk constantly improves its products and reserves the right to make changes and improvements at its discretion without being obliged to apply such benefits to the machines that were previously sold.

Any change and/or addition of accessory must be approved and perfo

## UNPACKING/TRANSPORT

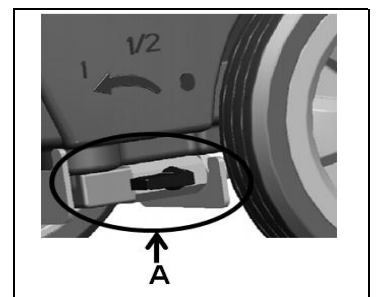
Please follow carefully the instructions on the package when unpacking.

On delivery, please inspect the packing and the machine to ensure no damage has been done during transport. If there is any visible damage, please keep the original form, and ask the carrier to confirm and fill out a list of damages for compensation.



### – CAUTION

When unpacking and unloading, or during moving the machine across ground with steps, please take care to avoid hitting the on/off switch regulating the water flow, Part A in the figure on the right.



## OPERATION CAPABILITIES

The SC500 scrubber-dryer is used to clean (scrubbing and drying) smooth and solid floors, in civil or industrial environment, under safe operation conditions by a qualified operator.

The scrubber-dryer cannot be used for fitted carpet and carpet cleaning.

## CONVENTIONS

Forward, backward, front, rear, left or right are intended with reference to the operator's position, that is to say in driving position with the hands on the handlebar (1).

## UNPACKING/DELIVERY

To unpack the machine, carefully follow the instructions on the packing.

When the machine is delivered, check that the packing and the machine were not damaged during transportation.

In case of visible damages, keep the packing and have it checked by the carrier that delivered it. Call the carrier immediately to fill in a damage claim.

Please check that the following items have been supplied with the machine:

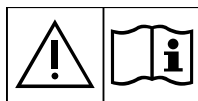
- Technical documents:
  - Scrubber-dryer Instructions for use Manual
  - Electronic battery charger manual (if installed)
  - Scrubber-dryer Spare Parts List

## SAFETY

The following symbols indicate potentially dangerous situations. Always read this information carefully and take all necessary precautions to safeguard people and property.

The operator's cooperation is essential in order to prevent injury. No accident prevention program is effective without the total cooperation of the person responsible for the machine operation. Most of the accidents that may occur in a factory, while working or moving around, are caused by failure to comply with the simplest rules for exercising prudence. A careful and prudent operator is the best guarantee against accidents and is essential for successful completion of any prevention program.

### VISIBLE SYMBOLS ON THE MACHINE



**WARNING!**

*Carefully read all the instructions before performing any operation on the machine.*



**WARNING!**

*Do not wash the machine with direct or pressurized water jets.*



**WARNING!**

*Do not use the machine on slopes with a gradient exceeding the specifications.*

## SYMBOLS THAT APPEAR ON THIS MANUAL



### DANGER!

*It indicates a dangerous situation with risk of death for the operator.*



### WARNING!

*It indicates a potential risk of injury for people.*



### CAUTION!

*It indicates a caution or a remark related to important or useful functions.  
Pay careful attention to the paragraphs marked by this symbol.*



### NOTE

*It indicates a remark related to important or useful functions.*



### CONSULTATION

*It indicates the necessity to refer to the Instructions for use Manual before performing any procedure.*

## GENERAL INSTRUCTIONS

Specific warnings and cautions to inform about potential damages to people and machine are shown below.



### DANGER!

- *Before performing any maintenance, repair, cleaning or replacement procedure, remove the ignition key and disconnect the battery connector.*
- *This machine must be used by properly trained operators only.*
- *Do not wear jewels when working near electrical components.*
- *Do not work under the lifted machine without supporting it with safety stands.*
- *Do not operate the machine near toxic, dangerous, flammable and/or explosive powders, liquids or vapours: This machine is not suitable for collecting dangerous powders.*
- *When using lead (WET) batteries, keep sparks, flames and smoking materials away from the batteries. During the normal operation explosive gases are released.*
- *When using lead (WET) batteries, battery charging produces highly explosive hydrogen gas. During battery charging, lift the recovery tank and perform this procedure in well-ventilated areas and away from naked flames.*



### WARNING!

- *Carefully read all the instructions before performing any maintenance/repair procedure.*
- *The machine ignition key has a built-in magnet. Do not place objects having magnetic bands (such as credit cards, electronic keys, phone cards) near the key. The built-in magnet can damage or erase the data stored on the magnetic bands.*
- *Before using the battery charger, ensure that frequency and voltage values, indicated on the machine serial number plate, match the electrical mains voltage.*
- *Do not pull or carry the machine by the battery charger cable and never use the battery charger cable as a handle. Do not close a door on the battery charger cable, or pull the battery charger cable around sharp edges or corners. Do not run the machine on the battery charger cable.*
- *Keep the battery charger cable away from heated surfaces.*
- *Do not charge the batteries if the battery charger cable or the plug are damaged.*
- *To reduce the risk of fire, electric shock, or injury, do not leave the machine unattended when it is plugged in. Before performing any maintenance procedure, disconnect the battery charger cable from the electrical mains.*
- *Do not smoke while charging the batteries.*
- *To avoid any unauthorized use of the machine, remove the ignition key.*
- *Do not leave the machine unattended without being sure that it cannot move independently.*

**WARNING!**

- Always protect the machine against the sun, rain and bad weather, both under operation and inactivity condition. Store the machine indoors, in a dry place: This machine must be used in dry conditions, it must not be used or kept outdoors in wet conditions.
- Before using the machine, close all doors and/or covers as shown in the Instructions for use Manual.
- This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the machine by a person responsible for their safety. Children should be supervised to ensure that they do not play with the machine.
- Close attention is necessary when used near children. Use only as shown in this Manual. Use only Nilfisk's recommended accessories.
- Check the machine carefully before each use, always check that all the components have been properly assembled before use. If the machine is not perfectly assembled it can cause damages to people and properties.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.
- Do not use the machine on incline.
- Do not tilt the machine more than the angle indicated on the machine itself, in order to prevent instability.
- Do not use the machine in particularly dusty areas.
- Use the machine only where a proper lighting is provided.
- While using this machine, take care not to cause damage to people or objects.
- Do not bump into shelves or scaffoldings, especially where there is a risk of falling objects.
- Do not lean liquid containers on the machine, use the relevant can holder.
- The machine working temperature must be between 0 °C and +40 °C.
- The machine storage temperature must be between 0 °C and +40 °C.
- The humidity must be between 30 % and 95 %.
- When using floor cleaning detergents, follow the instructions on the labels of the detergent bottles.
- To handle floor cleaning detergents, wear suitable gloves and protections.
- Do not use the machine as a means of transport.
- Do not allow the brush/pad to operate while the machine is stationary to avoid damaging the floor.
- In case of fire, use a powder fire extinguisher, not a water one.
- Do not tamper with the machine safety guards and follow the ordinary maintenance instructions scrupulously.
- Do not allow any object to enter into the openings. Do not use the machine if the openings are clogged. Always keep the openings free from dust, hairs and any other foreign material which could reduce the air flow.
- Do not remove or modify the plates affixed to the machine.
- When the machine is to be pushed for service reasons (missing or discharged batteries, etc.), the speed must not exceed 4 km/h.
- This machine cannot be used on roads or public streets.
- Pay attention during machine transportation when temperature the recovery tank or in the hoses could freeze and seriously damage the machine.
- Use brushes and pads supplied with the machine or those specified in the Instructions for use Manual. Using other brushes or pads could reduce safety.
- In case of machine malfunctions, ensure that these are not due to lack of maintenance. If necessary, request assistance from the authorised personnel or from an authorised Service Center.
- If parts must be replaced, require ORIGINAL spare parts from an Authorised Dealer or Retailer.
- To ensure machine proper and safe operation, the scheduled maintenance shown in the relevant chapter of this Manual, must be performed by the authorised personnel or by an authorised Service Center.
- Do not wash the machine with direct or pressurised water jets, or with corrosive substances.
- The machine must be disposed of properly, because of the presence of toxic-harmful materials (batteries, etc.), which are subject to standards that require disposal in special centres (see Scrapping chapter).

**TECHNICAL DATA**

Model	AS430B	AS510B
Machine Height	980mm	
Solution tank capacity	40 litre	
Recovery tank capacity	40 litre	
Diameter of transport wheel	200mm	
Diameter of guide wheel	76mm	
Power of vacuum system motor	350w	
Maximum gradient when working	2%(Max)	
Sound pressure level at workstation	70dB(A) ±3dB(A)	
Standard batteries	(2×12V) 24V 85Ah AGM	(2×12V) 24V 105Ah AGM
Battery compartment size (W x L x H)	340 x 330 x 260mm(Max)	
Vacuum system circuit capacity	1200 mm H <sub>2</sub> O	
Cleaning width	430mm	510mm
Squeegee width	760mm	760mm
machine maximum length	1060mm	1100mm
Machine width without squeegee	480mm	540mm
Brush diameter	430mm	510mm
Weight with batteries and with empty tanks	112kg	128kg
Gross weight of the machine ready for use	152kg	168kg
Brush motor power	550W	560W
Brush speed	150rpm	
Brush /pad-holder Maximum pressure	30kg (Max)	35kg(Max)
Packing size (Lx W x H)	1200 x 610 x 1170mm	

**MACHINE DESCRIPTION****MACHINE STRUCTURE**

- |  |  |
|--|--|
| 1. Safety switch button  | 20. Squeegee adjusting handwheel                                     |
| 2. Handlebar   | 21. Squeegee rear support frame                                      |
| 3. Control panel   | 22. Squeegee front support frame                                     |
| 4. Serial number plate/Technical data / Conformity certification | 23. Cup holder   |
| 5. Control cover   | 24. Recovery tank cover handle                                       |
| 6. Cable holder (*)  | 25. Recovery tank cover  |
| 7. Battery charging indication light                             | 26. Tank body  |
| 8. Reset switch  | 27. Water inlet cover  |
| 9. Battery connector   | 28. Brush deck   |
| 10. Battery cover  | 29. Brush / pad-holder   |
| 11. Vacuum tube for waste  | 30. Vacuum system motor  |
| 12. Squeegee drawing cord  | 31. Brush motor  |
| 13. Battery connector safety cover                               | 32. 8" wheel   |
| 14. Squeegee lifting handle                                      | 33. Battery  |
| 15. Draining hose  | 34. Vacuum tube  |
| 16. Squeegee fixed knob  | 35. Charger (*)  |
| 17. Squeegee clip  | 36. Float filter   |
| 18. Squeegee blade   | 37. Water level tube ( to indicate amount of water in Solution tank) |
| 19. Squeegee support frame                                       |  |

**(\*) applicable only to machines already installed with on-board charger (optional)**

FIGURES OF MACHINE STRUCTURE

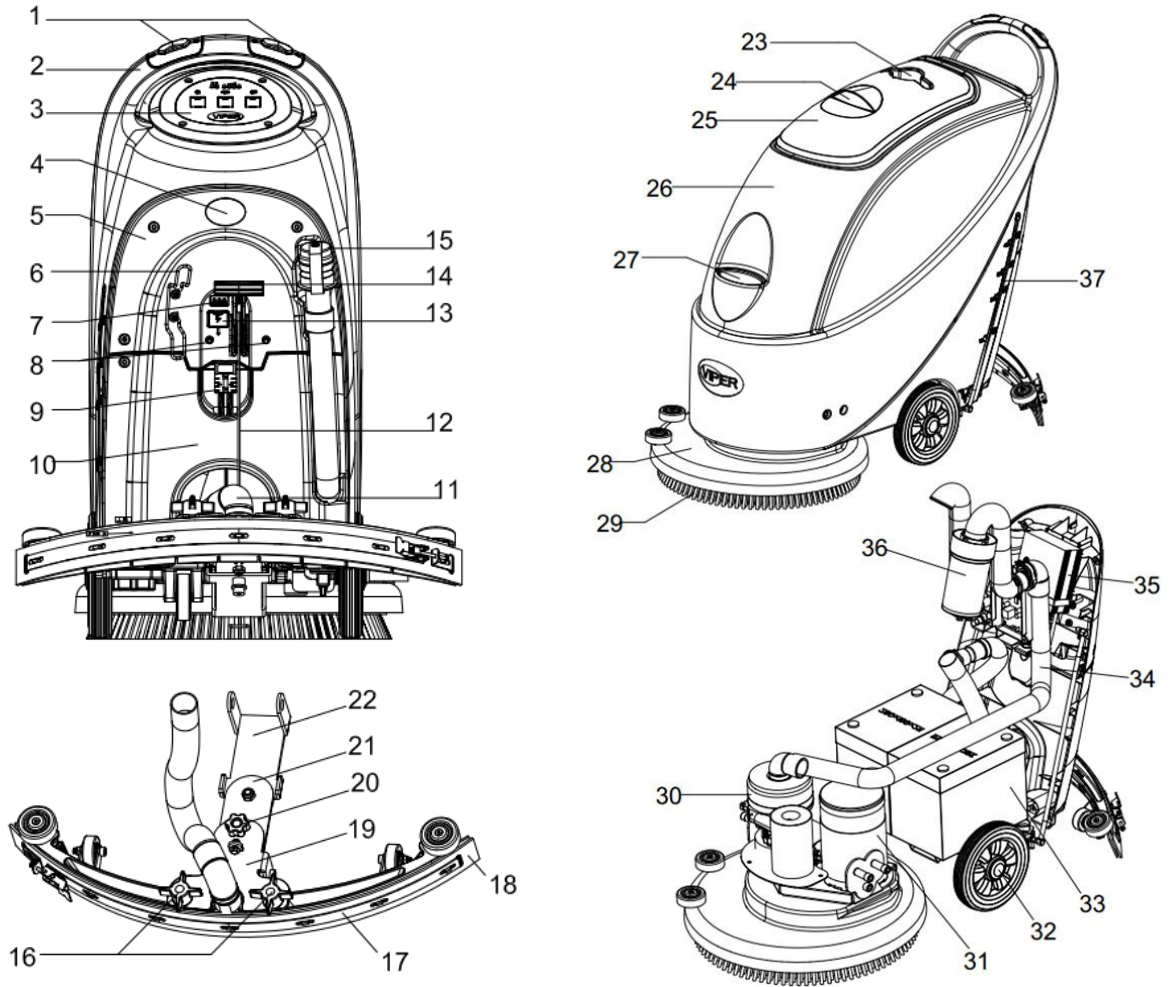


Figure 1

CONTROL PANEL (Figure2)

- 38. Battery charge indication light (green when saturated)
- 39. Battery exhausted indication light (red)
- 40. Battery exhausted indication light (red)
- 41. Power switch
- 42. Vacuum switch
- 43. Timer (optional, used to record working time of brush)
- 44. Solenoid valve switch for water spraying control

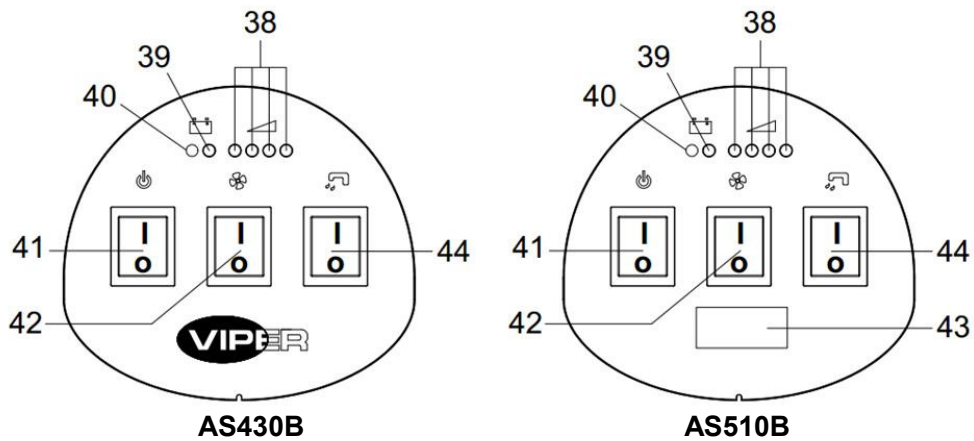


Figure 2

## DISPLAY WINDOW OF CHARGER INDICATION LIGHT (Figure 3)

### (Optional, applicable to models with built-in charger)

1. When charging starts, the red indication light of the charger (45) flashes a few times and then steadies to become a permanent red indication light, entering into the first stage of charging;
2. After charging for a period of time, the red indication light of the charger (45) will go out, A yellow indication light (46) will light up permanently: entering the second stage of charging;
3. After charging for approximately 10 hours, the amber indication light (46) will turn off, (47) The green indication light will become permanently lit, indicating that the charge is full, and charging has ended.

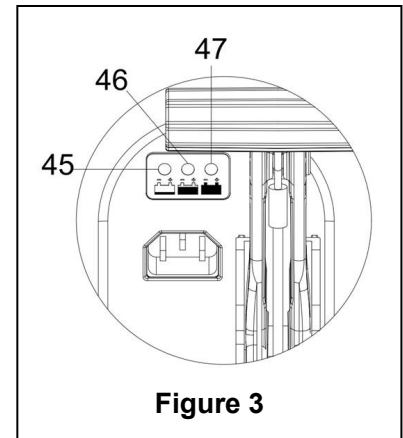


Figure 3



### NOTE

- 1) During charging, If the yellow indication light flashes: the battery is not of the type compatible to the charger, or the battery is not properly connected, or a short circuit has taken place at the output terminal.
- 2) If the red indication light is flashing: a short circuit inside the charger. (For details, please refer to the related sections in the charger instruction.)

## GUIDE FOR USE



### WARNING

On certain parts of the machine are pasted some indicative signs:

- DANGER
- WARNING
- CAUTION
- CONSULTATION

When reading this manual, the operator must pay particular attentions to the symbols on these signs. Under no circumstances shall these signs be covered. If they are damaged, please replace immediately.

## INSTALLING AND SETTING THE BATTERY OF THE NEW MACHINE



### WARNING

If the battery is incorrectly installed or inaccurately connected, the electric components of the machine may be seriously damaged. The battery may only be installed by qualified personnel. According to the battery model number (WET or GEL) being used, set the functional circuit board and on-board charger (optional).

**Please check if the battery is damaged before installing.  
Disconnect the battery connector and the on-board charger plug.  
Be careful when touching the battery.**

This machine needs two (2) 12V batteries. Please connect as shown in Figure 4 on the right.

This machine can supply any of the following models:

### a) Batteries (WET or GEL/ AGM) are already installed and can be used at any time.

1. Check the battery. Through the connector (9) connect the battery to the machine.
2. (Only applicable to AS430B and AS510B): Press down the on/off switch (41). If the green light is on, it shows that the battery is ready for use. If the amber or red light is on, it shows that the battery needs charging. (Please refer to the section on maintenance for related procedures).

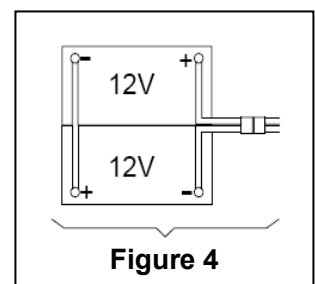


Figure 4

**b) Without batteries**

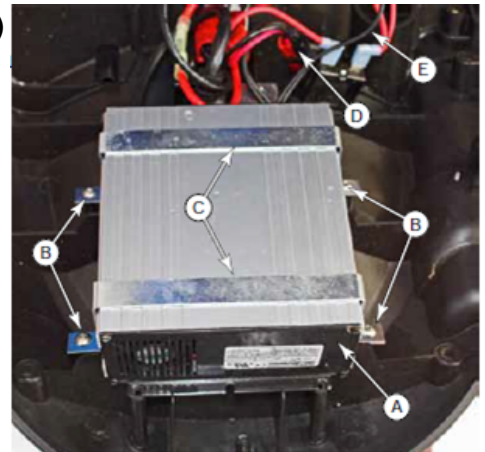
1. Purchase similar battery (refer to the section on technical parameters). Information on the selection of battery may be obtained from qualified battery agents.
2. Set the machine and the on-board charger (if equipped) according to the type of batteries (WET or GEL/AGM). Also read the following paragraph for the way to install the battery.

**Battery charger setting (only for on-board charger if installed)**

**Battery charger**

The battery charger is located inside the rear cover and connected directly to the batteries. The charger is microprocessor controlled and uses different charging curves for optimal performance for different battery types.

1. Remove the Rear Covers (Control Cover) described on page 9.
2. Disconnect the cable connector(D) leading to the batteries.
3. Disconnect the two wire terminals (E) leading to the control board.
4. Remove the 4 screws (B) that secure the mounting straps (C) to the cover and remove the charger(A).

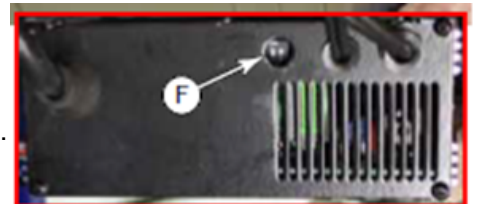
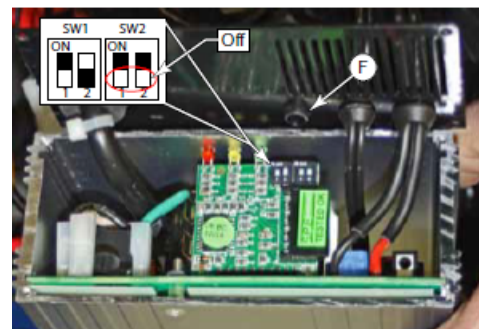


**Battery Type Dip-Switches (SPE Charger)**

The charger's function is controlled by 4 dip-switches (2-pair) inside the back cover. The second 2 switches should never be touched unless the charger has been replaced and their position needs to be confirmed, set the battery voltage(24V) and maximum amperage(9A) and it should always be in the Off position.

The first 2 switches are accessible through a plastic plug without opening the charger. These switches set the type of charge curve used for each type of battery. The curve type signifies the manner and magnitude in which current and voltage are applied to the battery during its distinct phases of the charge cycle.

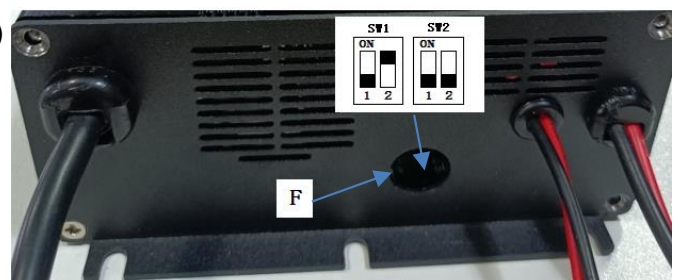
1. Only if the charger is new and the 2nd pair of DIP switches need to be confirmed, is it necessary to remove the rear cover.
2. Remove the plastic plug covering the DIP switch access Hole (F).
3. Set the first 2 DIP switches according to the table data below.
4. Replace the plastic plug.



Battery Type/Brand	Curve Type	SW1		SW2	
		D1	D2	D1	D2
Wet batteries	IUIa-ACD	On	Off	Off	Off
Gel batteries of Exide-Sonnenschein and Haze	IUIa-GEL	Off	Off		
Fullriver AGM batteries (Default)	IU0U-AGM	Off	On		
Discover AGM batteries	IUIa-AGM	On	On		

**Battery Type Dip-Switches (Powerfirst Charger)**

1. Remove the plastic plug covering the DIP switch access Hole (F).
2. Set the first 2 DIP switches according to the table data below.
3. Replace the plastic plug.



Battery Type/Brand	Curve Type	SW1		SW2	
		D1	D2	D1	D2
Wet batteries	IUIa-ACD	On	Off	Off	Off
Exide-Sonnenschein GEL batteries	IUIa	Off	Off		
Fullriver AGM batteries (Default)	IUUa	Off	On		
Discover AGM batteries	IUIa	On	On		

**INSTALLING BATTERY AND SETTING BATTERY TYPE (WET OR GEL/AGM)**

According to the battery type(WET or GEL/AGM) set the electric circuit board on the on-board charger. The procedures are as follows:

1. Make sure the connector of the battery is disconnected. If the machine is based on “AGM” battery at time of ex-factory, go directly to Step 8; otherwise, complete Steps 2, 3, and 4.
2. Take off draining hose (15)
3. If equipped with on-board charger, please take off the charge wire from the reel.
4. Take off the control cover (5), and the screws of the battery cover (10). Remove the screws on the PCB stand. The DIP switch (B) for setting the battery model can be seen when flipping over the PCB board. (See Figure 5)
5. Adjust the micro DIP switch (B) to the position of “WET”,

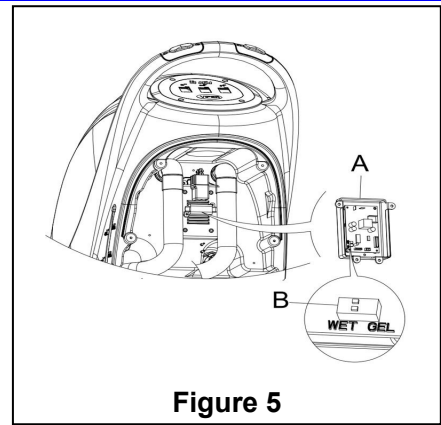


Figure 5

Default setting: GEL/AGM

DIP1	DIP2	Battery Type	LED status (Figure A)
OFF	OFF	WET batteries	LED1, LED2 flash twice
ON	OFF	Discover AGM batteries	LED3, LED4 flash twice
ON	ON	Other GEL/AGM batteries except Discover	LED3 flashes twice

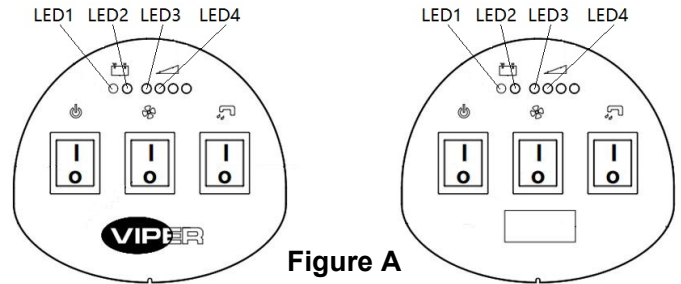


Figure A

6. Complete Steps 3, 4 and 5 in reverse order.

**Installing batteries**

7. Disconnect the battery connector 9 .
8. Open the recovery tanks cover (25) and check if the recovery tank is empty or not; if not, empty it through draining hose (15).
9. Unscrew the squeegee fixed knob (16), take off the connector connecting the vacuum tube for waste (11) to the squeegee, and then take off the squeegee.
10. Unscrew the screws of the battery cover (10) and remove the cover.
11. Unscrew the connector of the squeegee drawing cord (12) connecting to the squeegee bracket (19), and hang the squeegee drawing cord upwards.
12. Hang draining hose (15) and the vacuum tube for waste (11) upwards.
13. According to the size of the battery, push the fixation board in the battery box all the way inwards.

**NOTE**



The dimension of the battery must not exceed: H x W x H: 330mm x 170mm x 260mm. According to the varying dimensions of batteries, the requirements for the selection of fixed batteries are as follows:

- 1) For battery with length below 270mm, use 2 pieces of the fixation board (B, Figure 6) and place them side by side inside the water tank battery;
- 2) For battery with length between 310mm-270mm, use 1 piece of the fixation board (B, Figure 6) and place it in the water tank battery;
- 3) For battery with length between 330mm -310mm, there is no need for the fixation board to fix the position.

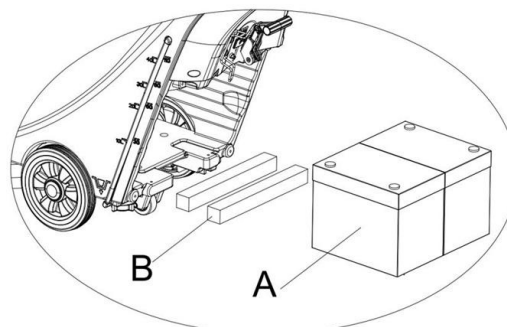


Figure 6

14. Install the battery with specially made battery installation tools (A, Figure 7). After the battery is installed, remove the battery installation tools, and install the battery fixation bracket (B, Figure 7).

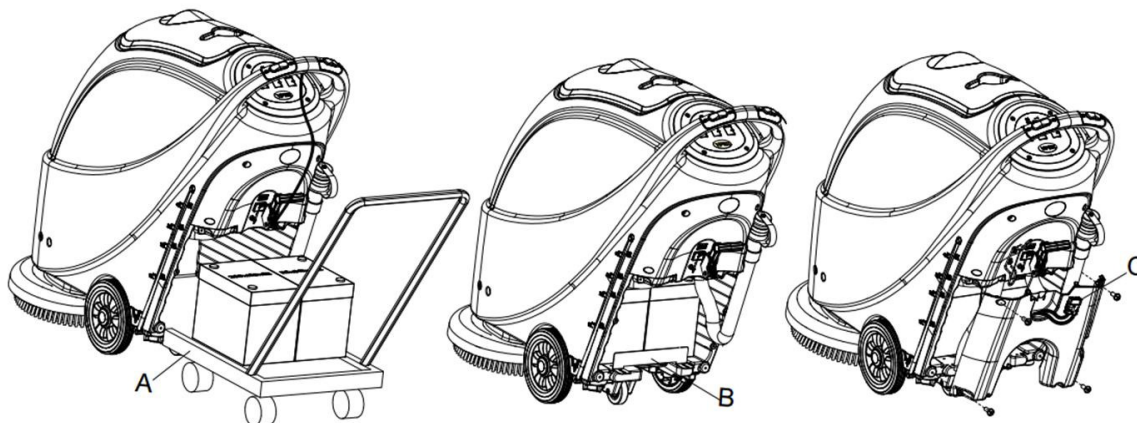


Figure 7

15. Put the battery connector (C, Figure 7) through the hole on the top of the battery box cover, put the draining hose through the right hole of the battery box cover, fix the battery box cover with 4 screws, and then install the squeegee drawing cord, draining hose, and the squeegee successively.

### Charging the battery

16. To charge the battery (refer to the steps stated in the maintenance section).

## BEFORE MACHINE START-UP

### INSTALLING AND UNLOADING THE BRUSH / PAD-HOLDER



#### NOTE

According to the type of floor to be cleaned, the machine may be installed with brush (Figure 8, A), or a pad-holder (Figure 8, B and C).



#### CAUTION !

When manually installing or unloading the brush/pad-holder, first check if all the switches are in the off position and lift the squeegee off the floor, only after which can the brush or pad-holder be worked on. Furthermore, please put on protective gloves to avoid being cut by fragments.

- (Only applicable to **AS430B** and **AS510B**): make sure the switch (41) is at the disconnecting (O) condition.
- Press down the handlebar (2) to lift the tank body (26).
- Put the brush (A) or the pad-holder (B – C) under the case.
- Use the handlebar (2) to lower the tank body (26) to come into contact with the brush or pad-holder.
- To install the brush/pad-holder automatically, turn the power switch (41) to the “I” position and press down the safety switch (1). Gently push the machine forward so as to allow the belt wheel at the bottom of the tank body to align with the brush or pad-holder which can then be installed. Then release the safety switch. If necessary, repeat this procedure until the brush/pad-holder is installed.
- If Step 5 above proves to be difficult, use the manual method by following the arrow head (D) to install the brush/pad-holder (as shown in Figure 8).
- To automatically unload the brush/pad-holder, turn the power switch (41) to the “O” position. Use the hand to hold the handlebar, and press the machine downwards until the guide wheel touches the floor and the brush/pad-holder hangs in the air. Turn the power switch (41) to the “I” position, and press down the safety switch to let the brush or pad-holder turn until the brush/pad-holder drops to the floor.

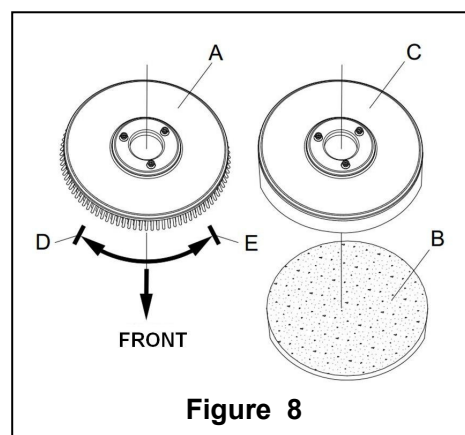


Figure 8

8. If Step No. 7 above proves to be difficult, use the manual method by turning the brush/pad-holder in the direction opposite to the normal turning direction, and it can be taken off. (as shown in Figure 8)

### ADJUSTING THE BALANCE OF THE SQUEEGEE

9. Install the squeegee and turn it tight with the handle. Then connect the vacuum tube for waste to the squeegee.
10. Adjust the squeegee through the adjusting handle (A) of the squeegee (see Figure 9).
- 1) If the mid-section of the rear squeegee strip, section B, has a gap with the floor or the downward pressure is relatively light, adjust the handle in an anti-clockwise direction until the whole length of the rear squeegee strip touches well with the floor. The front squeegee strip should lightly touch the floor.
  - 2) If the two ends of the rear squeegee strip, sections C and D, have a gap with the floor or the downward pressure is relatively light, adjust the handle in a clockwise direction until the whole length of the rear squeegee strip touches well with the floor. The front squeegee strip should lightly touch the floor.

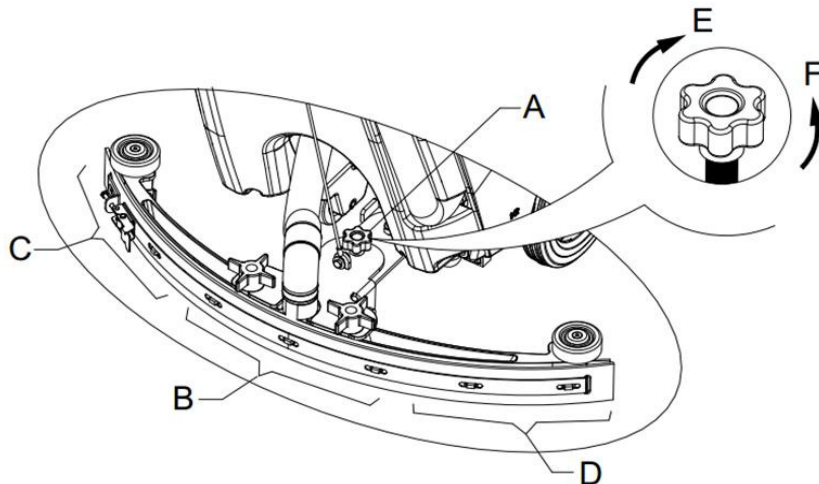


Figure 9

### Solution tank filling



#### CAUTION!

Only low foam, nonflammable detergents may be used. These detergents must be suitable for the use of scrubbers.

11. Open the water inlet cover (27) and add water to solution tank. Do not overfill the tank. Filling up to near the edge of the filter holder of the water inlet will suffice. When preparing the cleaning solutions, please follow the dilution rates supplied by the chemical manufacture and the water temperature must not exceed 40<sup>0</sup> C.

### REGULATING THE VOLUME OF WATER FLOW



#### WARNING !

Regulating the ball valve handle (A, Figure 10) must be done under the condition when the power switch (41) is in the "O" position.

12. The volume of the water flow may be adjusted through the ball valve handle (A, Figure 10) according to the amount of water practically required for scrubbing the floor.

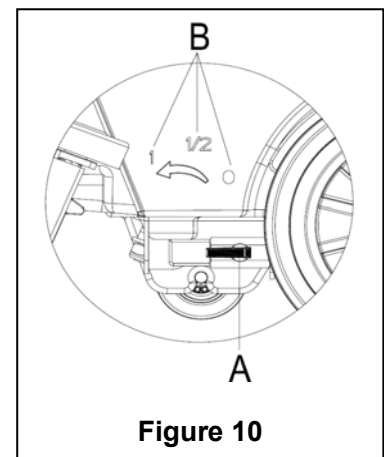


Figure 10

### MACHINE START AND STOP

#### Starting the machine

- 1 Complete the preparatory steps as related above.
- 2 Press the power switch (41) to the "I" position.
- 3 Use the squeegee handle (41) to lower the squeegee.
- 4 Press the Vacuum pump switch (42) to the "I" position.
- 5 Press the water flow volume control switch (44) to the "I" position. (Work simultaneously with the safety switch (1) to control the work of solenoid valve.)
- 6 Hold the safety switch (1) and push to move the machine. The brush (29) starts to rotate, and the machine starts its cleaning job.



**CONSULTATION:** The way to push the machine  
One of the characteristics of the machine is the Installation of two safety switches on both sides of handlebar. Each safety switch is capable of controlling independently the operation of the brush. In use, it facilitates the control of the operation of the machine.

By experience, the method to move the machine shown on right Figure 11 is more suitable, the users feel more comfortable on hands, it reduces work fatigue. So the users are recommended to move the machine in this way.



Figure 11

#### Turning off the machine

7. When you have finished using the machine, first unload the brush/pad-holder (refer to the steps related in the section on brush/pad-holder installation and unloading)
8. Release the safety switch (1) to turn off the brush/pad-holder and solenoid valve.
9. Press the Vacuum pump switch (42) to the "O" position, and the Vacuum pump will delay for 5 seconds before stopping work.
10. Press the water flow volume control switch (44) to the "O" position to completely turn off the work of solenoid valve.
11. Press the power switch (41) to the "O" position.
12. Use the squeegee lifting handle (14) to lift the squeegee.
13. Grasp the handlebar (2) and gently tilt the machine backward until the guide wheel (B) touches the floor. See Figure 12.

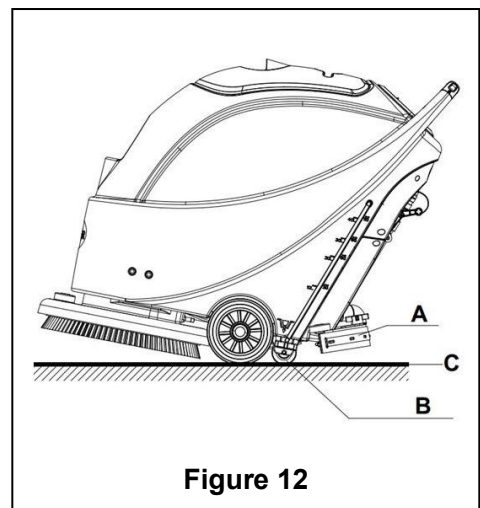


Figure 12

### MACHINE OPERATION (SCRUBBING AND DRYING)

1. Start the machine according to the description above.
2. Hold the safety switch (1) (according to the way shown in **Figure 11**), push to move the machine, and start the cleaning job.
3. If necessary, turn off the machine, and adjust the regulating handle of the squeegee. (Refer to the steps for adjusting the balance of the squeegee)
4. If necessary, turn off the machine, and adjust the volume of water flow with the ball valve handle. (Refer to the steps of adjusting volume of water flow.)



#### CAUTION!

In order to avoid damaging the floor, when the machine stays in one place without moving, please turn off the power switch (41).

#### Battery discharge during operation

5. It is only when the green warning light (38) is continuously lit that the power supply of the battery is sufficient for the normal operation of the machine.

**NOTE**

When all the four green lights (38) turn on, it shows that the battery is fully charged. When only the last green light (38) is on, and begins to flash, suggest charging the battery, for the machine will stop automatically after a few minutes.

After the last green light (38) turns off, and the red light (39 and 40) begins to flash, the machine will stop automatically after a few seconds. (Refer to the steps related in the maintenance section).

**CAUTION!**

Do not use the machine when the power supply of the battery is insufficient, so as to avoid damaging the battery and shortening the life of the battery.

**TANK EMPTYING**

When recovery tank is full, a float in the automatic float turn-off device (36) will block the inlet connecting to the vacuum pump. Through a sudden increase of noise from the vacuum pump, it can be considered that the vacuum pump is already overloaded and an immediate draining of the wastewater is needed.

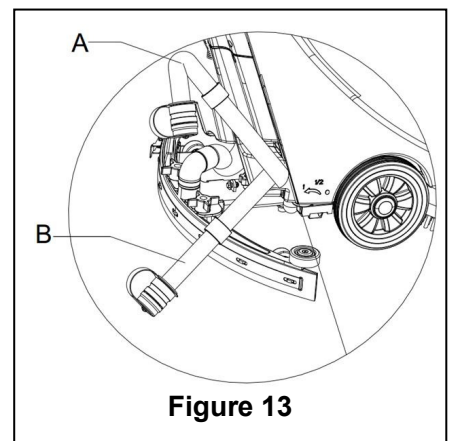
**CAUTION!**

If the vacuum pump is suddenly turned off (e.g. because the machine is suddenly moved resulting in an activation of the float), and if a resumption of operation is needed, please perform the following steps: press the power switch (41 and 42) to turn off the power and the vacuum pump, and open the recovery tank cover (25) to check if the float in the float filter has returned to the water surface. Then close recovery tank cover (25), and press the power switch (41 and 42) to turn on the power and the vacuum pump.

When the recovery tank is fully filled with wastewater, follow the following steps to drain it all.

**Recovery tank emptying**

1. Turn off the machine.
2. By using the squeegee handle (14), lift the squeegee.
3. Move the machine to a dedicated dump site.
4. Grasp the handlebar (2) and gently incline the machine backward until the guide wheel touches the floor. (For docking of the machine please refer to the procedures in the stopping of the machine section.)
5. Take off the draining hose from the fixation clip, bend the top end of draining hose (as shown in **A, Figure 13**), and then open the cover of draining hose, lower draining hose to a low level or on the ground to drain the water. Alternatively, directly place draining hose to a low position or on the ground to make the water outlet face downward (as show in **B, Figure 13**), and then twist open the water draining lid to drain off the wastewater in the tank. After draining is completed, use pure water to cleanse the inside of recovery tank.



**Figure 13**

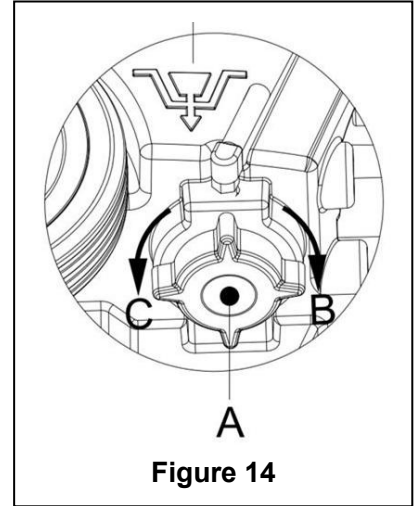
**CAUTION!**

When draining the wastewater, the vacuum tube for waste must be folded or lowered to a lower position (as shown in Figure 13 A or B), and then open the lid of the vacuum tube for waste to drain the water. Do not make the outlet of the vacuum tube for waste face upward to drain the water vertically. This is to avoid wastewater spilling onto the operator.

**Solution tank emptying**

6. Complete Steps 1 to 4.

- As shown in **Figure 14**, turn open the lid of Solution tank (A) anticlockwise along direction C, and drain Solution tank completely. Use pure water to cleanse the inside of Solution tank. When work is completed, turn tight the lid of Solution tank (A) clockwise in direction B.



**Figure 14**

### AFTER USING THE MACHINE

When work is done and before leaving the machine, completes the following steps:

- Follow the procedure as described in aforementioned section about installing and unloading the brush/pad-holder, and take off the brush/pad-holder.
- Following the procedures described in related sections, drain the water completely in Solution tank and recovery tank.
- Complete the daily maintenance procedures (refer to the section on maintenance).
- Store the machine, including the brush/pad-holder and squeegee, in a clean and dry place. The squeegee should be lifted or taken off.

### PERIODS OF INACTIVITY

If the machine is not to be used for more than 30 days, please treat it in the following way:

- Complete the necessary procedure that should be followed after the machine is used.
- Disconnect the connector (9) connecting the battery and the machine.
- In order not to damage the battery, and if the machine is not to be used for more than 3 months, please charge the battery once every 3 months.

### USING FOR THE FIRST TIME

After using for the first 9 hours, please check all parts to make sure nothing has become loose or damaged during operation, and check if there are any visible damages or leakage.

### MAINTENANCE AND CARE

The service life and the maximum operation safety of the machine are assured by proper and timely maintenance and care.

The following table provides a general maintenance plan for the machine. The time intervals of maintenance are determined to a large extent by the working conditions of the machine. These time intervals should be formulated by the personnel responsible for the maintenance.



#### WARNING!

**Only after the power of the machine is turned off and the connection between the machine and the battery is disconnected should these procedures be performed. Before proceeding with any of the maintenance procedures, please study carefully the related safety sections.**

All maintenance in the plan or all additional maintenance must be done by qualified personnel or authorised service centers.

This manual only relates the simplest and the most common maintenance procedures.

For any maintenance procedures other than those stated in this table of planned maintenance, please refer to the maintenance manual of the service center.

**SCHEDULED MAINTENANCE TABLE**

Procedure	Daily, Machine after use	Weekly	Every 6 months	Annually
Charge battery				
Clean squeegee				
Clean brush/pad-holder				
Clean water tank and float filter, inspect the sealing strips of the water tank				
Inspect and change the squeegee strip				
Clean Solution filter				
Clean Vacuum pump filter				
Inspect liquid level of WET battery				
Inspect tightness of nuts and bolts			(1)	
Inspect or change motor carbon brush of brush/pad-holder				(2)
Inspect or change carbon brush of Vacuum pump				(2)

(1) It should be done 9 hours after the machine starts working.

(2) These maintenance procedures must be done by an authorized VIPER Service Center.

**BATTERY CHARGING****NOTE**

It is time to charge the battery when the amber or red warning light is lit up, or every time when work is done.

**CAUTION!**

Keep the battery in a fully charged condition in order to extend the service life of the battery.

**CAUTION!**

Once the power of the battery becomes insufficient, the battery must be charged as soon as possible. Please check the charger at least once a week.

**CAUTION!**

If an on-board charger is not equipped, please select a suitable external charger to charge the battery.

**WARNING!**

Particular care must be taken when charging the battery because there may be leakage of acid during the charging process. Battery acid is corrosive. If skin or the eye accidentally comes into contact, please flush with plenty of water and see a doctor.

1. Open the lid of recovery tank (25) and observe if recovery tank is empty or not. If it is not empty, empty it through draining hose. (15).
2. Move the machine to a specified charging area.
3. Press the power switch (41) to the "O" position to turn off the machine.
4. Only applicable to WET water-addition battery
  - Check the level of electrolyte inside the battery. If necessary, fill it up through the lid.
  - Keep all lids open.
  - If necessary, clean the top surface of the battery.
5. Select one of the following procedures to charge the battery according to the model of battery being used.

**To charge a battery with an external charger**

6. Check, according to the related manual, if the external charger is appropriate. The output voltage must be DC 24V.
7. Connect the battery connector to the external connector, and connect the external connector to the mains.

8. When charging is complete, connect the charging connector of the battery to the machine.

#### **To charge a battery with an on-board charger (optional)**

9. Take off the rubber lid at the end of the battery charging connector.
10. Connect the end of the battery charging connector with the mains with a charge connecting wire. (Please note whether the input voltage of on-board charger is 220V – 240V and the output voltage 24V and frequency meet the requirements.) When the charger is connected to the mains, all other functions will be cut off automatically. If the red warning light on the on-board charger continues to light, it shows that the charger is charging the battery.
11. When the green warning light (47) is on, it shows that the battery charging process is complete.
12. When charging is complete, take off the connecting wire from the end of the battery charging connector and the mains, and put on the rubber lid.
13. Disconnect the charger wire from the mains, and wind the wire on the reel (6).



#### **NOTE**

If more information on on-board charger (35) is needed, please refer to related manual.

### **SQUEEGEE CLEANING**



#### **NOTE**

In order to maintain the optimal effect of water Vacuum, the squeegee must be kept clean, and the squeegee strip must remain in a good condition.



#### **CAUTION !**

When cleaning the squeegee, it is recommended to put on protective gloves because the squeegee may contain sharp fragments.

1. Move the machine to a flat and smooth surface.
2. Press the power switch (41) to the “O” position to turn off the machine.
3. Unscrew the fixed handle (16) of the squeegee; take off the connector connecting the Recovery Vacuum tube of the squeegee, and take off the squeegee.
4. Use the squeegee lifting handle (14) to lift the squeegee support frame.
5. Clean the squeegee (Figure 15). Clean in particular the groove (A, Figure 15) and the dirt and fragments on the Vacuum tube. Check if the front squeegee blade (C) and the rear squeegee blade (D) are intact, and if there are broken edges and cracks. Change them if necessary (refer to the steps in the following section).
6. Re-install the squeegee in the reverse order of the above.

### **SQUEEGEE BLADE CHECK AND REPLACEMENT**

1. Following the methods related in the previous section clean the squeegee (Figure 15)
2. Check the edge (E, Figure 15) of the front squeegee blade and the edge (F) of the rear squeegee blade (D). On the whole length, they should be on the same level. Otherwise, adjust their heights through the following procedure.
  - Loosen the clip (G) to let the rear squeegee blade (D) separate from the bracket (M) for the adjustment of the position of the squeegee. After the adjustment, lock the clip once again.
  - Loosen the screw on the handle (I) to adjust the front squeegee blade (C); tighten the handle screw after adjustment.
3. Check if the front squeegee blade (C) and the rear squeegee blade (D) is intact and if there are broken edges and cracks. If necessary, change them according to the following ways. Check the front edge of the rear squeegee blade (J) whether it has been worn. If worn, it can be installed upside down (the top edge is required to be intact). If the top edge is also worn, change it by following the procedure below:
  - Loosen the clip (G) to let the pressure blade separate from the bracket (M), take off the clip bar (K), and then change or turn the rear squeegee blade (D) upside down. Re-install the rear squeegee blade in the reverse order of taking it off.
  - Loosen the handle screw (I) and take off the front clip bar (L), and then change the front squeegee (C).

Re-install the front squeegee blade in the reverse order of taking it off.

After changing the squeegee blade (or installing upside down), adjust the level of the front and rear squeegee blades in the procedures as described above.

4. Connect the Vacuum tube (11) to the squeegee.
5. Install the squeegee and use the knob (16) to tighten it, and then connect the Vacuum tube to the squeegee.
6. If necessary, adjust the squeegee through the adjusting handwheel (20) (refer to the procedures for adjusting the balance of the squeegee).

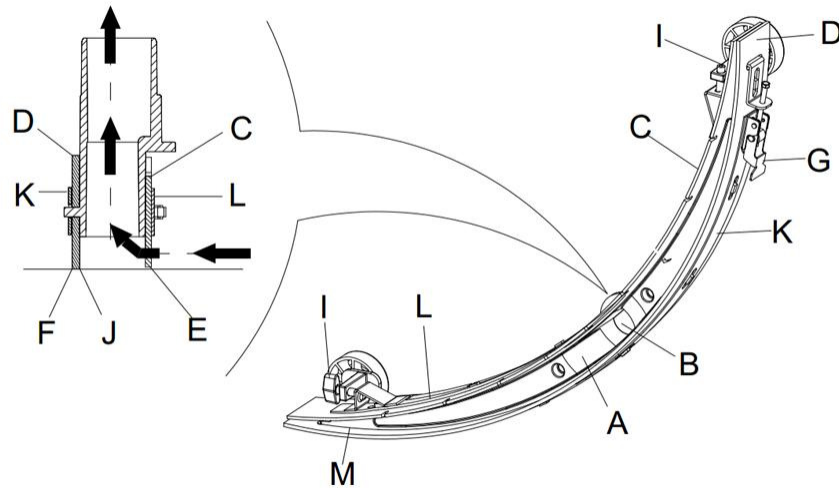


Figure 15

## BRUSH/POLISHING PAD CLEANING



### CAUTION!

When cleaning the brush/pad-holder, the wearing of protective gloves is recommended because they may contain sharp fragments.

1. In the way as related in previous sections, take off the brush/pad-holder.
2. With the use of water and detergents, clean the brush/pad-holder.
3. Check the completeness and wearing condition of the bristles on the brush and, if necessary, change the brush.
4. Check the wearing condition of the pad-holder and, if necessary, change the pad-holder.

## WATER TANK AND FLOAT FILTER MESH CLEANING

1. Move the machine to a dedicated dumping site.
2. Press the power switch (41) to the position "O" to turn off the machine.
3. Open recovery tank lid (A, Figure 16), and take off the float device (36) from recovery tank.
4. Use pure water to clean recovery tank lid (A), the tank (B and C), and the float filter support frame (E). Through the Recovery tube (15), drain all the water from the water tank.
5. If necessary, following the symbols "Open" and "Close" as shown in Figure 16, open the bottom lid (F) of the float filter and clean the float (D), float filter support frame (E), and the filter sponge (I). After cleaning, fix the float onto the float filter support frame (E), and then align the mark groove (L) of the bottom lid (F) of the float filter with the mark groove (L) of the float filter support frame (E). Turn the bottom lid (F) of the float filter tight, and fix the filter sponge (I) onto the float filter support frame (E), and then onto the Vacuum tube (M).
6. Check the soundness of the sealing ring (G) of the water tank lid.



### NOTE

The sealing strip (G) of the water tank makes the water tank create a vacuum. It must be completely sealed to be able to effectively suck the wastewater from the floor.

If necessary, the sealing strip of the water tank (G) may be taken out from the groove (H) and changed. When assembling a new water tank sealing strip, as shown in Figure 16 below, install the connector to the middle section of the rear part.

7. Check if the receiving surface of the sealing strip (G) is intact and seals adequately.

8. Close recovery tank lid (A).

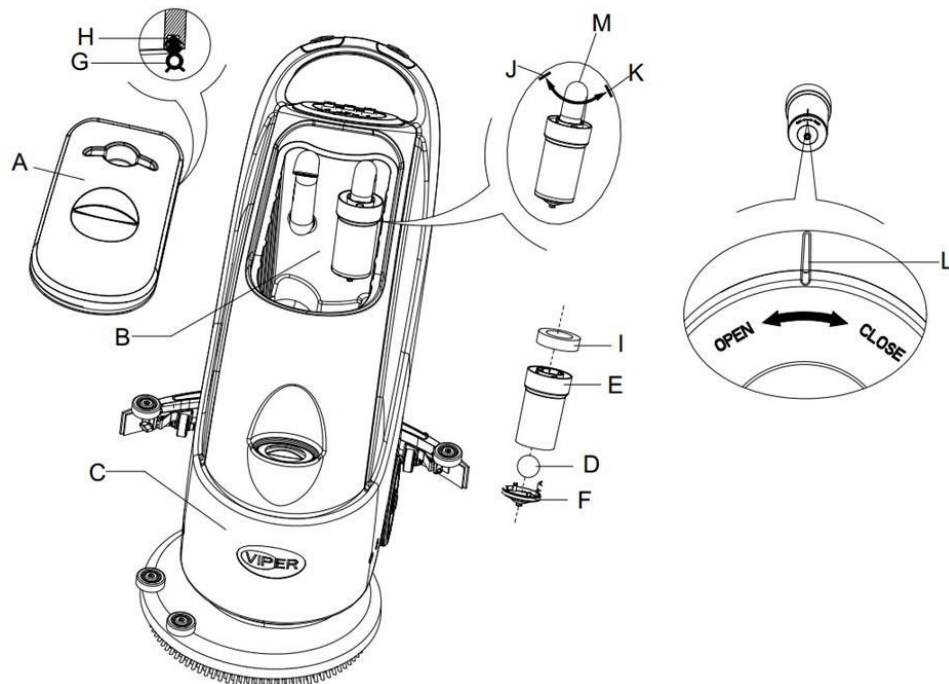


Figure 16

**SOLUTION FILTER CLEANING**

1. Drain all the water from Solution tank in the way as introduced in related sections.
2. Move the machine to a flat and smooth ground.
3. Press the power switch (41) to the “O” position to turn off the machine.
4. Turn off the draining ball valve (A, Figure 17) (located at the bottom of the machine, behind the wheels). Position B ball valve open, and position C ball valve closed.
5. Take off the transparent lid (D), and then take off the filter (E), and install them onto the filter box (F) after cleaning.



**NOTE**

The filter (E) must be accurately installed onto the position of the projection (G).

6. Open the draining ball valve (A).

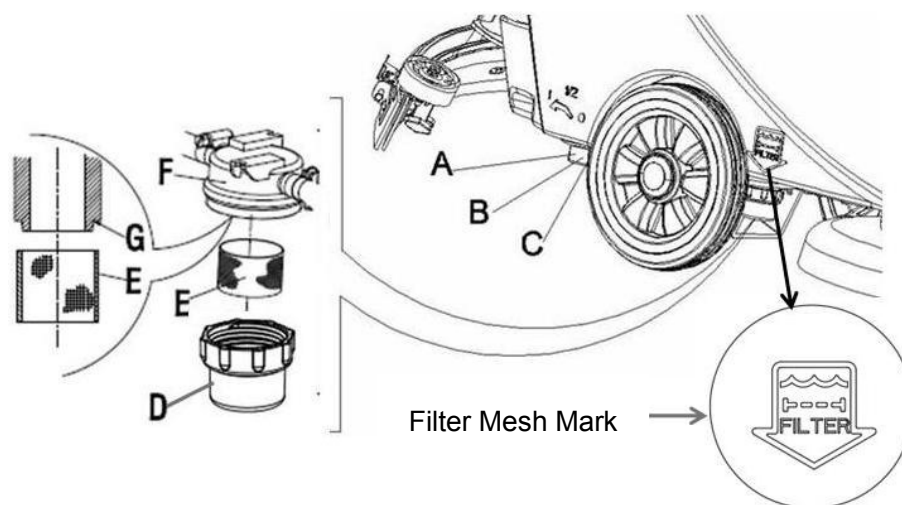
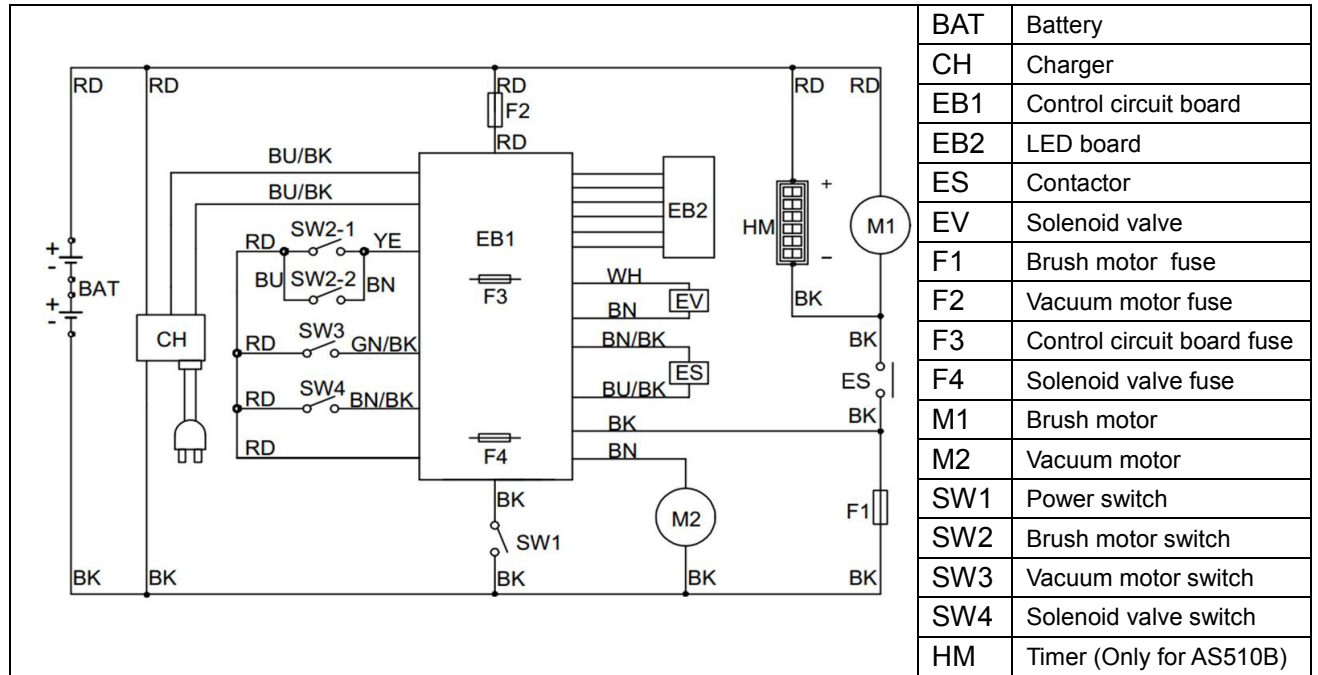


Figure 17

CIRCUIT FIGURE OF AS430B AND AS510B



COLORS CODES		
RD: Red	BN: Brown	BU/BK : Blue /Black
BU: Blue	YE: Yellow	GN/BK: Green/Black
BK: Black	WH: White	BN/BK: Brown/Black

## TROUBLESHOOTING

Breakdown	Probable Causes	Remedies
Machine not working: Indication light not on	Battery connector (9) not connected.	Connect the battery connector
	Battery power already exhausted	Charge the battery
Warning light (39 and 40) flashing	Brush motor overloaded	Change to a soft brush to adapt to the floor being cleaned
	Other matters jam the rotating of the brush	Clear up the brush
Brush not working	Brush fuse trip off	Reset
	Belt slipping	Check belt, adjust tension pulley
Vacuum motor not working	Vacuum fuse trip off	Reset
Inadequate Vacuum	Wastewater tank is full.	Drain the water tank
	Vacuum tube for waste and squeegee not properly connected	Connect the Vacuum tube for waste and the squeegee
	Float filter blocked or inlet blocked	Clean the float filter, check the float ball
	Squeegee dirty or squeegee blade worn and damaged	Clean and check the squeegee
	Recovery tank lid not properly turned on, or the sealing strip of the water tank damaged	Refit on the lid properly, or change the water tank sealing strip
Pure water supply to the brush inadequate	Filter dirty.	Clean the filter
Squeegee leaving marks	Debris like fragments under the squeegee blade	Remove the fragments
	Squeegee blade already worn, cracked, brittle.	Change the squeegee blade
	Balance of squeegee not adjusted	Adjust the balance



### NOTE

**If the machine is installed with the optional on-board charger, and when the on-board charger is defective, the machine cannot be operated.**

**If the on-board charger is defective, please contact the authorised maintenance center.**

**To find out more information, please refer to the maintenance manual (available at any maintenance center of VIPER)**

## MACHINE DISPOSAL

Use qualified crushing machine to destroy this machine.

Before destroying this machine, please take away and segregate the following materials which, according to related laws and regulations, must be properly processed.

- Battery
- Brush/pad-holder
- Plastic hoses and plastic components
- Electrical and electronic components (\*)

(\*): Please contact the nearest VIPER Center (especially when scrapping of electrical and electronic components is required).

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