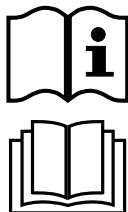




# 512 ET - 712 ET - LION 512 ME - LION 712 ME



**(IT)** MANUALE ISTRUZIONI PER L'USO  
**(EN)** OPERATOR'S MANUAL  
**(FR)** MANUEL D'INSTRUCTIONS  
**(DE)** BEDIENUNGSANLEITUNG  
**(ES)** MANUAL DE INSTRUCCIONES  
**(NO)** BRUKERHÅNDBOK  
**(NL)** GEBRUIKERSHANDLEIDING  
**(PT)** MANUAL DE UTILIZAÇÃO  
**(SE)** INSTRUKTIONSBOK  
**(RU)** РУКОВОДСТВО ОПЕРАТОРА  
**(BG)** РЪКОВОДСТВО ЗА ЕКСПЛОАТАЦИЯ

Consultare attentamente questo manuale prima di procedere a qualsiasi intervento sulla macchina

Read this manual carefully before carrying out any work on the machine

Lire attentivement ce manuel avant toute intervention sur la machine

Vorliegendes Handbuch vor jedem Eingriff an der Maschine aufmerksam durchlesen

Consulte detenidamente este manual antes de llevar a cabo cualquier trabajo en la máquina

Konsulter denne håndbogen nøye før du går i gang med noen som helst type inngrep på maskinen

Raadpleeg deze handleiding aandachtig alvorens met enige werkzaamheid aan de machine te beginnen

Consulte atentamente este manual antes de efectuar qualquer intervenção na máquina

Läs noggrant igenom denna handbok innan du utför något som helst ingrepp på maskinen

Прочетете внимателно това ръководство, преди да започнете работа с машината

Внимательно ознакомьтесь с данным руководством перед проведением работ с машиной

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# **IMPORTANT SAFETY**

## **PRECAUTIONS**

Parts of the text requiring special attention are printed in bold and preceded by the symbols illustrated and described below.



### **! DANGER:**

Indicates the need for care in order to avoid serious consequences that could lead to the death of personnel, or to situations representing a possible health and safety hazard.

### **! ATTENTION:**

Indicates the need for care in order to avoid serious consequences that could involve harm being done to the machine or to the workplace, or lead to economic losses.



**! DANGER:** If lead-acid (WET) batteries are installed in the machine, keep sparks, flames and smoking materials away from the batteries. Explosive gases can escape during normal use, particularly when recharging the batteries.



**! DANGER:** If lead-acid (WET) batteries are installed in the machine, charging the batteries produces highly explosive hydrogen gas. Leave the cowl open throughout the battery charging cycle and only carry out this procedure in well-ventilated areas, away from naked flames.



**! DANGER:** Do not operate the machine in the presence of flammable liquids or vapours, or combustible dusts.



**! DANGER:** Never pick up toxic materials.



**! DANGER:** Never pick up burning or incandescent objects.



**! DANGER:** This machine must not be used on floors where there are hazardous coatings / finishes / materials.

**! ATTENTION:** Never use the machine on wet surfaces.

**! ATTENTION:** make certain that the electrical specifications of the machine (voltage, frequency and power consumption) indicated on the data plate are compatible with those of the mains electricity supply.

**Do not use the machine:**

- without having read the operating and maintenance manual.
- without having been trained in its use.
- without having been specifically entrusted with its use.
- if legally under age.
- in the absence of bins and/or filters.
- if the machine is not working properly.
- in places without adequate lighting.
- in explosive environments.
- on public roads.
- outdoors: the machine must be used only indoors.
- where there is dirt that can be harmful to health (dust, gas, etc.).
- In areas that are too dark to safely see the controls or operate the machine.

### **Clothing and equipment:**

- Wear safety shoes with non-slip soles.
- Wear protective eyewear or visor and safety garments.
- Depending on the surface being cleaned and on the environment, the protective measures necessary for atomized sprays include respiratory masks with class FFP2 or equivalent or higher protection.

### **Before starting the machine:**

- Check that the machine is not damaged.
- Check that all safety devices are in place and operating correctly.

### **When using the machine:**

- The machine must be operated by one person only.
- Park the machine on a flat, level surface.
- Do not allow children to play on or near the machine.
- Do not use the machine to pick or suck up liquids.
- Do not use the machine to pick up wires, ropes, straps or similar materials.
- Evaluate the type of building the machine is operating in (e.g: hospitals, pharmaceutical or chemical industries, etc.) and scrupulously comply with the safety regulations and conditions in force in these facilities.
- The machine must not be used for purposes other than those expressly intended.
- The machine is intended for commercial use, for example in hotels, schools, hospitals, factories, shops, offices and business premises generally. Do not use for other purposes.
- The machine can be used only indoors.
- The machine must be stored only indoors.
- Do not allow the machine to be used as a toy.
- The machine is not designed for towing or

being towed.

- Never rest objects of any significant weight on the machine, for whatever reason.
- Never obstruct the air inlet and release vents.
- Never remove, modify or circumvent safety devices.
- During use, atomized spray may form. Inhaling this atomized spray can be harmful to health.
- Work providers must conduct a risk assessment in order to specify the necessary protective measures relating to the formation of atomized sprays, depending on the surface being cleaned and the environment. Masks with class FFP2 or equivalent or higher protection are suitable for protecting against the inhalation of atomized spray.
- Keep hands away from moving parts.
- In the case of malfunction and/or faulty operation, turn the machine off immediately (disconnect from the batteries/mains power supply) and do not tamper with it; contact a service centre approved by the manufacturer.
- The machine is designed to operate in temperatures between +4°C and +40°C. It can be stored in temperatures between +0°C and +50°C when not in use.
- The machine is designed to operate at relative humidity levels between 30% and 95%.
- The machine can operate at altitudes up to 2000 m maximum.
- Do not use the machine to clean surfaces on slopes or gradients steeper than indicated on the data plate.
- Do not operate the machine on slopes or gradients steeper than indicated on the data plate.
- When using the machine on gentle gradients, do not move transversely across the slope, but keep the machine on a line parallel to the direction of the incline, manoeuvring carefully and without making U-turns.
- The machine must not be used by persons (including children) with diminished physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised by a person responsible for their safety and have received instruction in the use of the machine.
- Never use the machine to transport people or goods or for towing.
- Do not wear jewellery, watches, ties or other items.
- The operator must always use Personal Protective Equipment: protective apron or overalls, non-slip waterproof shoes, rubber gloves, protective eyewear and ear defenders, and mask for protection of the respiratory airways.

**Before leaving the machine or before maintenance:**

- Park the machine on a flat, level surface.
- Turn off the machine and remove the ignition key.

**When performing maintenance:**

- All operations must be carried out in conditions guaranteeing adequate visibility and lighting.
- Isolate the machine from its power source by disconnecting the batteries.
- The operator must always use Personal Protective Equipment: protective apron or overalls, non-slip waterproof shoes, rubber gloves, protective eyewear and ear defenders, and mask for protection of the respiratory airways.
- Do not wear jewellery, watches, ties or other items.
- Protect the batteries from impurities such as metal dust.
- Take care when handling battery acid, and avoid contact. In the event of battery fluid leakage, do not touch the fluid and observe the following precautions: Contact with the skin can cause irritation; wash with soap and water. Inhalation of vapours can cause irritation to the airways; stay out in the open air and consult a doctor. Contact with the eyes can cause irritation; wash the eyes immediately, flooding with water for at least 15 minutes, and consult a doctor.
- Never rest tools on the batteries as they could cause short circuits leading to explosions.
- Always use the battery charger accompanying the machine (if supplied), or if not, a product with specifications as recommended in the technical data.
- Installation of the battery should be entrusted to a IP CLEANING approved service technician.
- Inspect the power cable of the battery charger periodically to ensure that it is not damaged; in the event of damage being discovered, the appliance cannot be used. Replacement of the cable should be entrusted to a IP CLEANING approved service technician. Detach both connections of the battery charger (AC side and DC side).
- Do not tug at the battery charger cable to disconnect it from the socket: grip the plug firmly and pull.
- Never wash the machine with water jets.
- Cleaning and maintenance operations that can be performed by the user must not be entrusted to children unless under supervision.
- All repairs must be carried out by a IP CLEANING approved service technician.
- Use only original accessories and spare parts supplied exclusively by the manufacturer,

as only these are able to guarantee safe and trouble-free operation of the machine.







- Never use parts removed from other machines or from other kits.

When the machine is to be loaded onto or unloaded from a vehicle:

- Empty the debris bins before loading the machine.
- Do not drive the machine on a slippery ramp.
- Take particular care when operating the machine on ramps.
- Turn off the machine and remove the ignition key.
- Lock the wheels of the machine.
- Use straps to anchor the machine.

**KEEP THESE INSTRUCTIONS SAFE.**

## **SAFETY SYMBOLS**

	MAXIMUM SLOPE
	OPERATOR MANUAL, INSTRUCTIONS FOR USE
	READ THE OPERATOR MANUAL
	DIRECT CURRENT SYMBOL
	INSULATION CLASS: THIS CLASSIFICATION ONLY APPLIES TO BATTERY POWERED MACHINES.
	EXTERNAL BATTERY CHARGER CONNECTION POINT

# TECHNICAL SPECIFICATIONS

			512 ET	712 ET
Cleaning width		mm	500	700
Cleaning capacity per hour		m <sup>2</sup> /h	3500	4500
Machine power (P <sub>M</sub> )		W	276	408
Front debris bin capacity		l	50	65
Rear wheel diameter		mm	250	250
Negotiable gradient		%	2	2
Gross weight (GVW)		kg	198	280
Weight of the machine in transit without batteries		kg	78	93
Weight of the machine in transit with batteries		kg	122	181
Number of batteries		no.	1	2
Machine voltage V <sub>M</sub>		V	12	24
Individual battery capacity		Ah (5h)	118	118
Individual battery weight		kg	44	44
Supply voltage (battery recharge)	Version without on board battery charger	V	12 dc	24 dc
Max current (battery recharge)		A	15	15
Mains supply voltage	Versions with on board battery charger	V	100-240 ac 50-60 Hz	100-240 ac 50-60 Hz
Max current (amperes) I		A	4	4
Machine dimensions		mm X Y Z	1225 903 753	1225 903 943
Packed size (length, width, height)		mm	1290 800 1200	1290 1050 1235
Sound pressure - Annex DD (Emission of acoustical noise) EN 60335-2-72: 2012		LpA (dBA)	65	68
Measurement uncertainty		K (dBA)	3	3
Guaranteed sound power Lwa,g		LWA (dBA)	74	77
Vibration level (hand) - IEC 60335-2-72		ahv m/sec <sup>2</sup>	≤2.5	≤2.5
Measurement uncertainty, k		m/sec <sup>2</sup>	/	/
IP degree		IP	IPX3	IPX3

Gross weight (GVW): maximum permissible weight with the machine fully loaded and ready for use. The gross weight of the machine includes the detergent solution tank full of clean water, empty dirty water tank (half full in the case of recycling systems), empty dust bags, the hopper filled to its rated capacity, the largest recommended batteries and all accessories such as cables, hoses, detergent, mops and brushes.

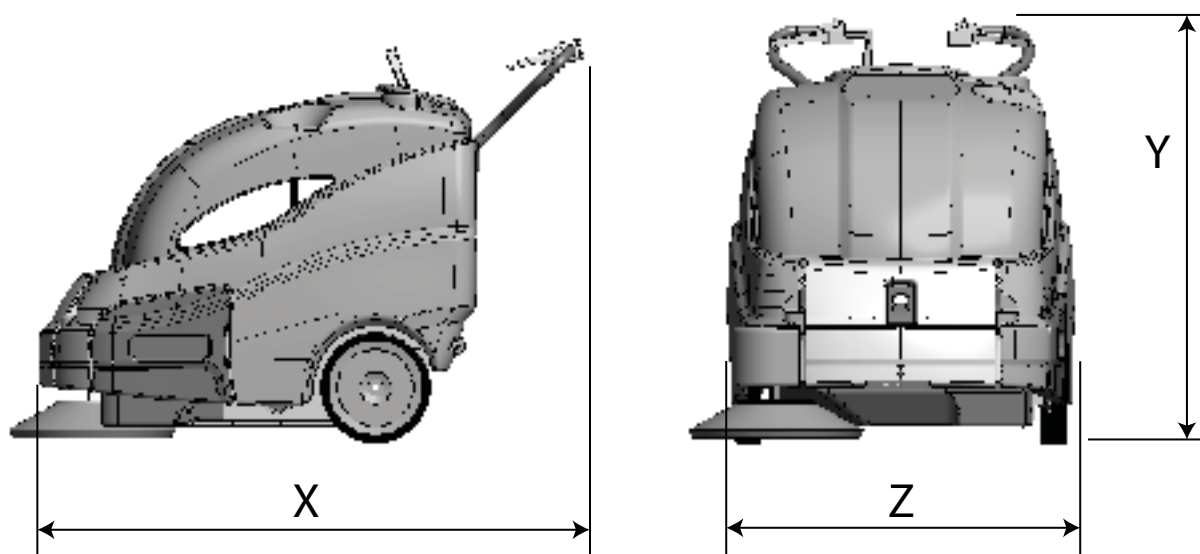
Transported weight: the weight of the machine including batteries, but excluding optionals (for example, the operator's cabin, FOPS (Falling Object Protective Structure), second and third side brushes and front brush attachment), fresh water (in the case of scrubbers or combination machines) and the weight of a standard operator (75 kg).

Data subject to changes without prior warning

V, I: charging / supply values

V<sub>M</sub> \* P<sub>M</sub> : machine in average operating conditions (all functions active)

## MACHINE DIMENSIONS



X-Y-Z: See "TECHNICAL SPECIFICATIONS" table



# **GENERAL INFORMATION**

## **Purpose of this manual**

This manual has been written by the Manufacturer and is an integral part of the [machine](#)<sup>1</sup>.

It defines the purpose for which the machine has been designed and constructed and contains all the information required by [operators](#)<sup>2</sup>.

In addition to this manual, which contains information for operators, other publications are available providing specific information for [maintenance personnel](#)<sup>3</sup>.

The terms “right” and “left”, “clockwise” and “anti-clockwise” refer to the forward movement of the machine.

Constant compliance with the instructions provided in this manual guarantees the safety of the operator and the machine, ensures low running costs and high quality results and extends the working life of the machine. Failure to follow these instructions may lead to injury to the operator or damage to the machine, floor and environment.

Consult the table of contents at the beginning of the manual to find the section of interest without delay.

**Although your machine may differ appreciably from the illustrations in this document, the correctness and validity of the instructions contained in this manual are guaranteed.**

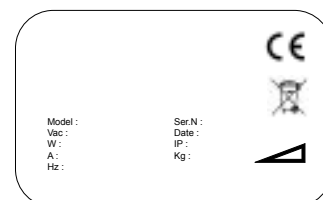
## **Identifying the machine**

The nameplate provides the following information:

- Name of manufacturer.
- Model.
- Serial number.
- Year of manufacture.
- Power supply voltage (charging/supply value).
- Current intensity (maximum charge level, in line as far as possible with the value indicated by the battery manufacturer).
- Gross weight.
- IP degree of protection.
- Machine voltage (in average operating conditions).
- Machine power (in average operating conditions).
- Maximum negotiable gradient.

## **Documentation provided with the machine**

- User manual;
- CE certificate of conformity;
- Certificate of warranty;
- Battery charger operator's manual (OPTIONAL);



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<sup>1</sup> The definition "machine" replaces the trade name covered by this manual.

<sup>2</sup> Persons responsible for using the machine without performing any operations requiring precise technical skills.

<sup>3</sup> Persons with experience, technical training and a knowledge of legislation and standards, able to perform all the necessary operations and to recognise and avoid possible risks in handling, installation, use and maintenance of this machine.

# **TECHNICAL INFORMATION**

## **Main parts of the machine**

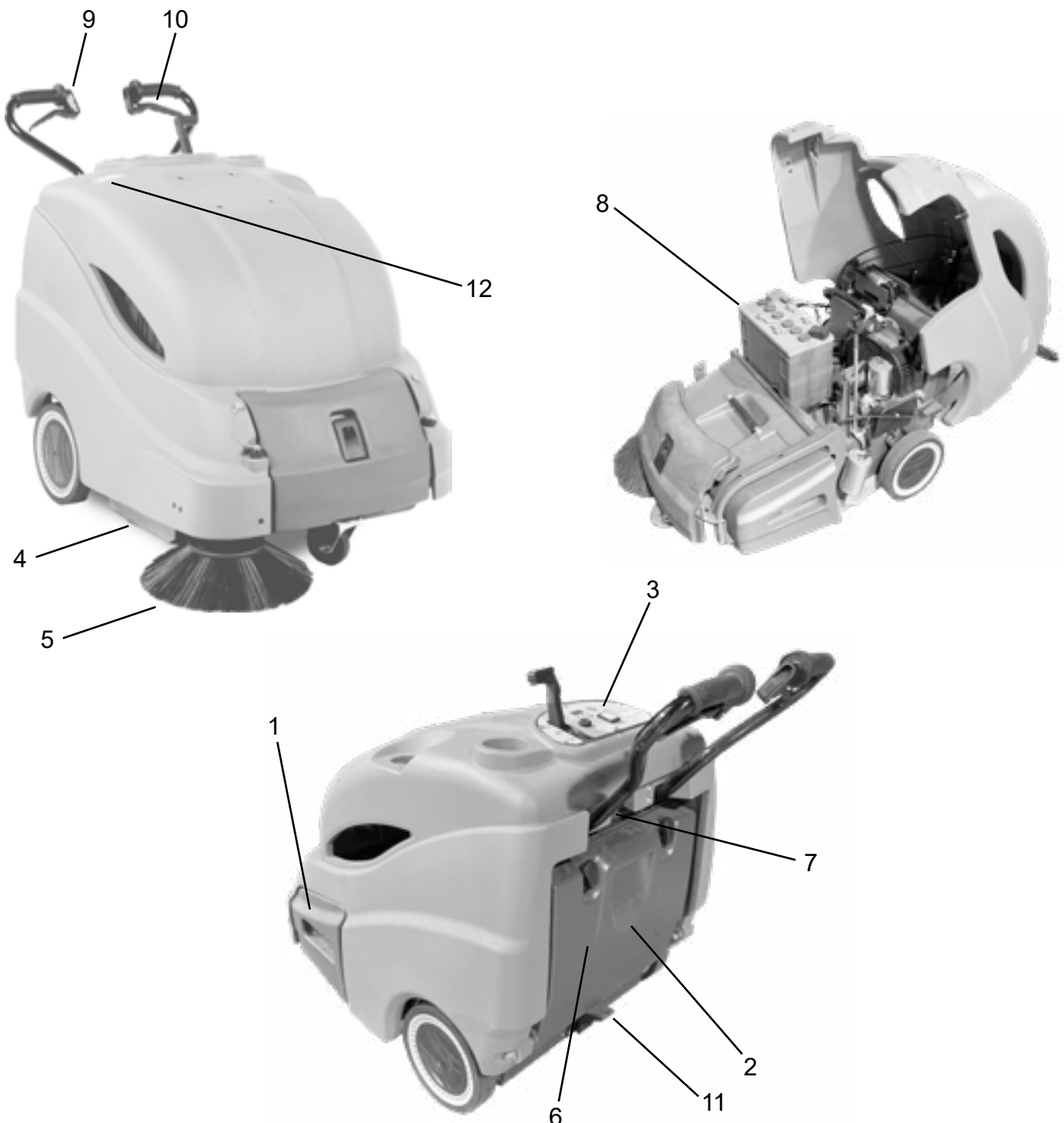
### **General description**

The machine described in this manual is a motorised sweeper designed to sweep floors in civil and industrial premises.

The motorised sweeper may be used to clean the residues of industrial processes, dust and dirt in general on all relatively even, flat and hard surfaces such as concrete, asphalt, porcelain stoneware, ceramic tiles, sheet metal, marble, embossed or smooth rubber or plastic mats.

The main parts of the machine are listed below:

1. Front debris bin.
2. Rear debris bin.
3. Control panel.
4. Centre brush.
5. Side brush.
6. Suction filter.
7. Filter shaker
8. Battery compartment.
9. Drive operating lever.
10. "Flap Raising" operating lever.
11. Parking brake (OPTIONAL)
12. Battery charger display (OPTIONAL) / connector for external battery charger.



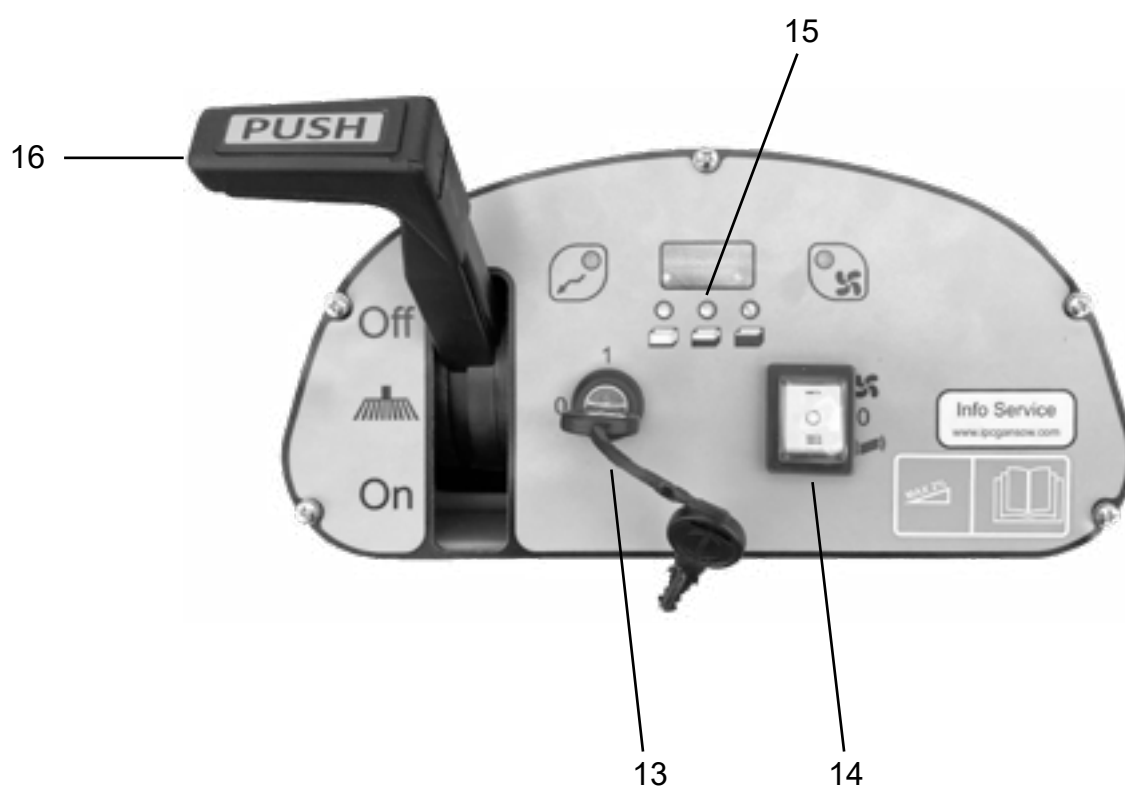
## Control panel

The machine has the following controls and indicator lights:

13. Main switch/Ignition switch: connects and disconnects electrical power to and from all functions of the machine.
14. Electric filter shaker/suction motor switch/button, enables/disables suction motor and electric filter shaker.
15. Battery charge indicator.
16. Side brush lifting lever.

## Accessories

- Brushes
- WET and GEL batteries
- Battery charger
- Filter
- Pre-filter



# **HANDLING AND INSTALLATION**

## **Lifting and transporting the palletized machine**

**! ATTENTION:** during all lifting operations, make sure the palletized machine is firmly secured to prevent it tipping over or being accidentally dropped.

The machine must be loaded onto/unloaded from vehicles in areas with adequate lighting.

The machine is packaged on a wooden pallet by the Manufacturer. It must be loaded on to the transporting vehicle using suitable equipment (see Directive 2006/42/EEC and subsequent amendments and/or additions). At destination, it must be unloaded using similar means.

The palletized body of the machine can be lifted only with the aid of a fork lift truck. Handle with care to avoid impact and ensure the machine is not overturned.

## **Inspection on delivery**

When the carrier delivers the machine, make sure the packaging and machine are both whole and undamaged. If the machine is damaged, make sure the carrier is aware of the damage and before accepting the goods, reserve the right (in writing) to request compensation for the damage.

## **Unpacking**

**! DANGER:** when unpacking the machine, the operator must wear suitable Personal Protection Equipment (gloves, eyewear, etc.) to limit the risk of injury.

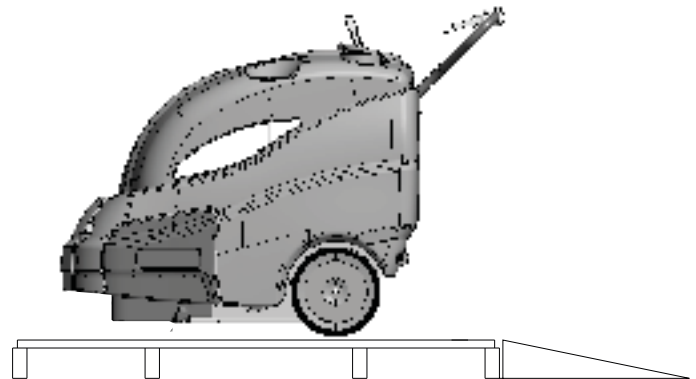
When unpacking the machine, proceed as follows:

- Cut and remove the plastic straps using scissors or nippers;
- Remove the cardboard packaging;
- Remove the side brush placed inside the battery compartment;
- Remove the bag placed inside the battery compartment and check the contents: user manual; CE certificate of conformity; battery charger manual (OPTIONAL); instructions for setting up the battery charger; 1 x connector for battery charger; 2 x hex wrench;
- Remove the metal brackets securing the front/rear wheels and the machine chassis to the pallet base.
- Release the parking brake, if installed.
- Using a ramp, push the machine off the pallet in the reversing direction. The machine must not be lifted.
- Remove the brush from its packaging.
- Clean the outside of the machine, taking care to observe safety regulations.

Once the machine has been removed from its packaging,

proceed to install the batteries, referring to the section “**Batteries: installation and connection**” and fit the side brush, referring to the section “**Fitting the side brush**”.

The various items of packaging can be kept, if so desired, as these can be reused to protect the machine in the event of it being moved to a different site or sent to a repair workshop.



If not retained, the packaging must be disposed of in compliance with current regulations.

## **Batteries**

**! ATTENTION:** do not use NON-rechargeable batteries

Two different types of battery can be installed on these machines:

Leak-proof tubular batteries (WET): the electrolyte level must be checked regularly.

GEL or AGM batteries: this type of battery requires no maintenance.

The technical specifications of the battery must correspond to those listed in the section on the “**Technical specifications**” of the machine. The use of heavier batteries could seriously jeopardize manoeuvrability and lead to the drive motor overheating. Lighter batteries of lower capacity, on the other hand, will need to be charged more frequently.

## WET batteries, preparation:

**! DANGER:** The installation and connection/removal of the batteries must be entrusted to a **IP CLEANING** approved service technician (referred to hereinafter as skilled technician).

**! DANGER:** during installation of the batteries or any type of battery maintenance, the skilled technician must wear the Personal Protective Equipment (gloves, eyewear, overalls, etc.) needed to limit the risk of accidents. Keep away from naked flames, do not short circuit the battery poles, do not generate sparks and do not smoke.

**! DANGER:** in the event of battery fluid leakage, do not touch the fluid and observe the following precautions:  
Contact with the skin can cause irritation; wash with soap and water.  
Inhalation of vapours can cause irritation to the airways; stay out in the open air and consult a doctor.  
Contact with eyes can cause irritation, wash eyes immediately and thoroughly with water for at least 15 minutes; consult a doctor.

(WET) Batteries are normally supplied filled with acid and ready for use.

If the batteries in use are dry charged, they must be activated before being installed in the machine. Proceed as follows:

Remove the caps and fill all elements with sulphuric acid solution specific for batteries until the plates are completely covered (this requires at least a couple of passes for each element). **IF IN DOUBT, CONTACT YOUR LOCAL DEALER.**

Leave the batteries to stand for 4-5 hours to allow air bubbles to come to the surface and the plates to absorb the electrolyte.

Make sure the level of electrolyte is still above the plates and if necessary top up with sulphuric acid solution; Close the caps.

Install the batteries in the machine (following the procedure described below).

Charge the batteries before starting up the machine for the first time. Follow the instructions in the **"Battery charging"** section.

## Batteries: installation and connection

**! DANGER:** during installation of the batteries or any type of battery maintenance, the skilled technician must wear the Personal Protective Equipment (gloves, eyewear, overalls, etc.) needed to limit the risk of accidents. Keep away from naked flames, do not short circuit the battery poles, do not generate sparks and do not smoke.

**! DANGER:** in the event of battery fluid leakage, do not touch the fluid and observe the following precautions:  
Contact with the skin can cause irritation; wash with soap and water.  
Inhalation of vapours can cause irritation to the airways; stay out in the open air and consult a doctor.  
Contact with eyes can cause irritation, wash eyes immediately and thoroughly with water for at least 15 minutes; consult a doctor.

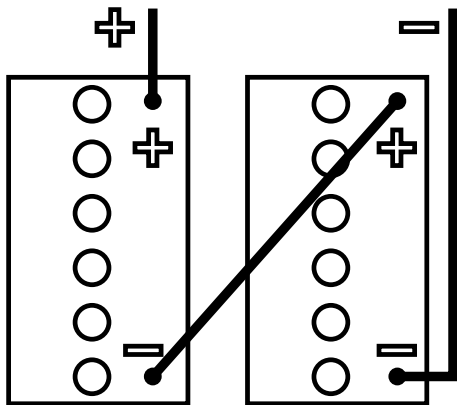
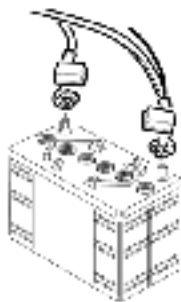
**! ATTENTION:** the operation of installing and connecting the batteries must be carried out by qualified personnel.

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

**! DANGER:** make sure that the terminals marked with the "+" symbol are connected to the positive poles of the battery. Do not check the battery charge by sparking.

Open the cowl, then place the batteries in the compartment, positioning them as indicated in the drawing.





Connect the wiring terminals to the battery poles, tighten the terminals to the poles and cover them with Vaseline. Close the cowling in the working position. When using the machine, follow the instructions below.

Selection of battery charger

**! DANGER:** use a battery charger with CE marking that is in compliance with product standard (EN 60335-2-29), equipped with double insulation or reinforced insulation between input and output, and with an output circuit of the SELV. type.

**! ATTENTION:** check that the battery charger is compatible with the batteries being charged.

Tubular lead-acid (WET) batteries: an electronic battery charger is recommended, but consult the manufacturer and the battery charger manual to confirm the suitability of the external battery charger.  
Gel or AGM batteries: use a charger intended specifically for this type of battery.

Preparing the battery charger

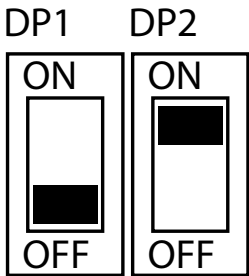
If the intention is to use a battery charger other than that provided with the machine, it must be fitted with the connector accompanying the machine.  
The connector supplied for the external battery charger is compatible with cables of maximum cross-section 16mm<sup>2</sup>  
Proceed as follows to fit the connector:  
remove 13 mm approx of the protective sheath from the red and black conductors of the battery charger cable;  
attach the ends to the contacts of the connector and squeeze forcibly with suitable crimping pliers;  
make certain the polarity is correct (red + black –) when attaching the wires to the connector.

On board battery charger settings (OPTIONAL)

**! ATTENTION:** where machines are shipped without batteries, the battery charger is factory-set for GEL-AGM batteries as the default configuration. If the intention is to fit a different type of battery, the battery charger setting **MUST** be changed as described below. Failure to observe these instructions could result in damage to the battery.

DP1	DP2	Charge curve
ON	OFF	IUIa-ACD, WET batteries
OFF	OFF	IUIa-GEL,Gel batteries, Exide-Sonnenschein, Haze
OFF	ON	IUOU-GEL, GEL and AGM batteries, <b>DEFAULT SETTING</b>
ON	ON	IUIa-AGM : AGM Discover batteries

SW1



## Fitting the side brush

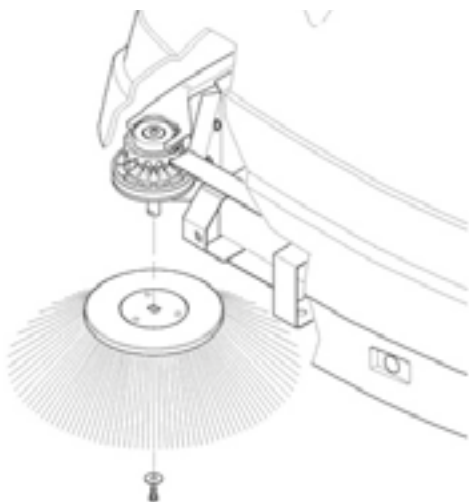
**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

Assembly:

- Move the side brush lifting lever to the "Off" position.



- Unscrew the screw on the side brush shaft.
- Place the brush on the shaft.
- Tighten the screw complete with washer.



Disassembly:

- Repeat the steps described above in reverse order.

# PRACTICAL GUIDE FOR THE OPERATOR

## Clothing and equipment

Wear safety shoes with non-slip soles.

Wear protective eyewear or visor and safety garments.

Depending on the surface being cleaned and on the environment, the protective measures necessary for atomized sprays include respiratory masks with class FFP2 or equivalent or higher protection.

## Before starting the machine

Clear away larger items of refuse before sweeping. Pick up any pieces of **wire, rope, straps or similar materials**, as these could become entangled around the brushes.


## Preparing the machine for work

Proceed as follows before starting work:

- Check that the battery is fully charged, and if not, carry out the recharging procedure: when undertaking this operation, refer to the section “**Charging the batteries**”.
- Make certain that the front debris bin is empty and, if not, empty it referring to the section “**Emptying the debris bin**”.

## Working

**! ATTENTION: do not use the machine without first reading the operating and maintenance manual.**

 **! DANGER: Do not operate the machine in the presence of flammable liquids or vapours, or combustible dusts.**

 **! DANGER: Never pick up toxic materials.**

 **! DANGER: Never pick up burning or incandescent objects.**

**! ATTENTION: Never use the machine on wet surfaces.**

- Turn the ignition key to switch the machine on.



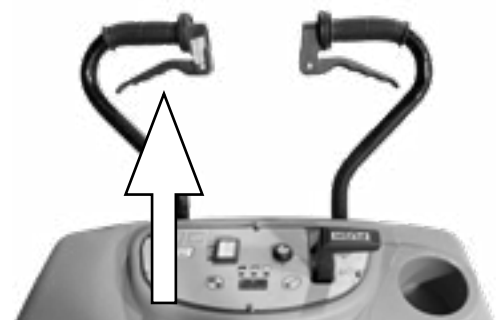
- After turning the ignition key, wait for 10 seconds until the machine starts running.
- Switch on the suction motor.



- Lower the side brush by moving the lever to the “On” position.



- Pull the drive lever and carry out the cleaning operations. After having finished work, move the side brush lever to the “Off” position and remove the keys from the control panel.





## Parking brake (OPTIONAL)

To apply the parking brake, depress the brake pedal fully.  
To release the brake, lift the pedal.



## During operation of the machine

- In the presence of bulky, particularly light objects (paper, leaves, etc.), raise the front of the machine by pushing on the handle while picking up the waste.
- Use the flap raising lever to collect bulky items.



- On completion of the work, vibrate the filter: when undertaking this operation, refer to the section “Cleaning the suction motor air filter”.
- Keep the centre brush properly adjusted: when undertaking this operation, refer to the section “Replacing and adjusting the centre brush”.

**! ATTENTION:** do not attempt to clean surfaces on slopes or gradients steeper than indicated on the machine data plate.

**! ATTENTION:** Do not operate the machine on slopes or gradients steeper than indicated on the data plate.

**! ATTENTION:** When using the machine on gentle gradients, do not move transversely across the slope, but keep the machine on a line parallel to the direction of the incline, manoeuvring carefully and without making U-turns.

## Battery charge indicator

Consists of 3 LEDs - red, yellow and green - which indicate the battery charge level. Possible charge level indications:

- green light, battery fully charged,
- yellow light, battery low.
- red light battery flat.

An automatic device prevents the machine from working beyond a certain battery discharge threshold.

When the machine reaches this threshold, it stops and must be charged in order to resume work: when undertaking this operation, refer to the section “Recharging the batteries”.



## Emptying the debris bin

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

### ! NOTICE

**All waste collection operations must be performed in compliance with the relevant laws in force.**

#### Front debris bin

- Release the bin by lifting the handle.
- Remove the bin from the machine and empty it.

#### Moving the machine when not in operation

Switch off the suction motor when moving the machine.



#### Rear debris bin

- Lift and turn the two bin locking devices.
- Grasp the bin by the handle, slide it out of the machine and empty it.



# MAINTENANCE INSTRUCTIONS



**! DANGER:** no maintenance work of any description must be carried out without first having isolated the machine from its power source. Maintenance operations on the electrical circuit — and in any event, all other operations not explicitly described in this operating manual — must be performed by a **IP CLEANING** approved service technician, in compliance with current safety regulations and as indicated in the maintenance manual.

## Maintenance - General rules

Performing regular maintenance according to the Manufacturer's instructions will improve performance and extend the working life of the machine.

When cleaning the machine, always observe the following precautions:

Avoid using pressure washers. Water could penetrate the electrical compartment or motors leading to damage or short circuits;

Avoid using steam, as the heat could cause the deformation of plastic parts;

Do not use solvents or hydrocarbon based products. These can damage the cowling and rubber components.

## Cleaning the suction motor air filter

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

### Cleaning the pre-filter (OPTIONAL)

- Remove the rear debris bin: when undertaking this operation, refer to the section "**Emptying the debris bin**".
- Remove the pre-filter from the filter.
- Clean the pre-filter with a vacuum cleaner or wash it under running water and allow it to dry completely before replacing it in the machine.

### Cleaning the filter

The suction filter makes a major contribution to the efficiency of the whole machine.

Proper filter maintenance will allow you to obtain the best performance from your machine. If the machine begins to raise dust as it sweeps, check the condition of the suction filter.

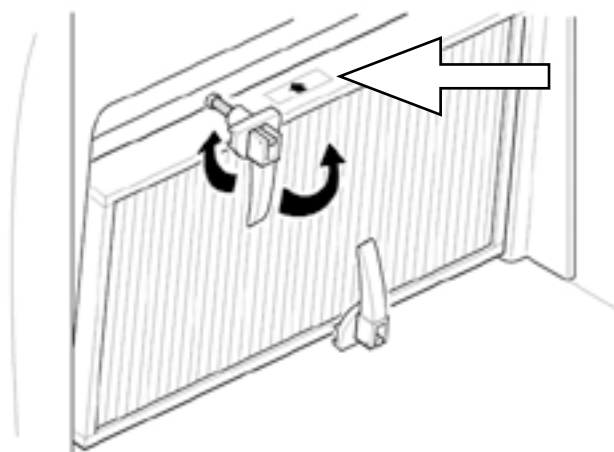
The suction filter can be cleaned as follows:

- Automatic cleaning with electric filter shaker. Press the electric filter shaker button for a few seconds. Repeat this operation while using the machine. This operation should be performed at the end of every working cycle. If the machine is used in a dusty environment (e.g. sawmills, warehouses where vehicles operate, etc.), make sure to use

the filter shaker more frequently.



- Manually cleaning the filter; if the filter shaker is not effective in cleaning the filter, and in any case every 20 operating hours, clean the filter manually:
  - Remove the rear debris bin: when undertaking this operation, refer to the section "**Emptying the debris bin**".
  - Remove the pre-filter (OPTIONAL).
  - Open the handles.
  - Turn the catches by 180°.
  - Remove the filter.
  - Clean the filter with a vacuum cleaner or alternatively blow the filter with compressed air (pressure not exceeding 6 bars) in the opposite direction to the air flow at a distance of more than 20 cm (8 inches).
  - Re-fit the filter (arrow must be pointing in the direction of air flow) from the outside to the inside of the machine; then fit the pre-filter.



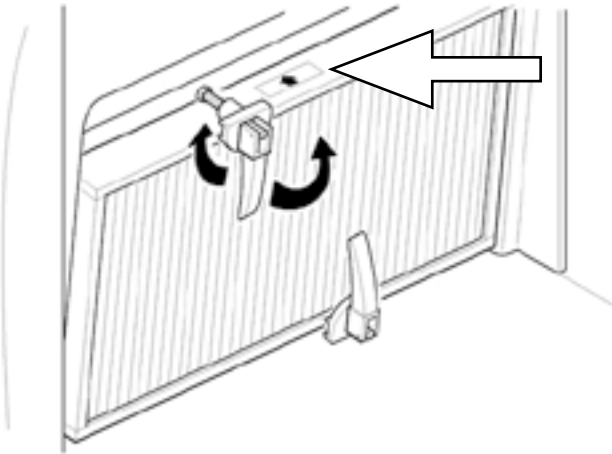
## Replacing the suction motor air filter

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

The filter must be replaced every 200 operating hours.

Follow the instructions:

- Remove the rear debris bin: when undertaking this operation, refer to the section "**Emptying the debris bin**".
- Remove the pre-filter.
- Open the handles.
- Turn the catches by 180°.
- Fit the new filter (arrow must be pointing in the direction of air flow), from the outside to the inside of the machine; then fit the pre-filter, if provided for.



**! ATTENZIONE :** When fitting the new filter, make sure there is perfect tightness between the filter and the gaskets.

### Fuses:

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

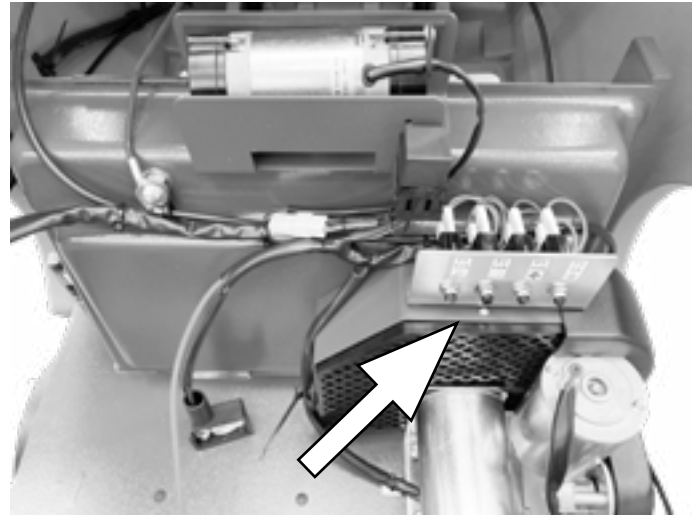
**! ATTENTION:** never install a fuse with a current rating higher than that specified.

The fuses can only be replaced by an IP CLEANING centre or by technical personnel authorised by IP CLEANING.

Open the cowling to gain access to the fuses.

The machine is equipped with resettable fuses also known as thermal fuses. These are resettable electrical circuit protection devices that stop the flow of current in the event of a circuit overload. Once a thermal fuse has tripped, let it cool down, then manually reset it by pressing the button provided.

If the overload that tripped the thermal fuse is still present, the fuse continues to interrupt the current flow until the problem is resolved.



## Battery maintenance



**! DANGER:** do not check the batteries by sparking. Lead-acid (WET) batteries give off flammable vapours: extinguish any naked flames or embers before checking or topping up the batteries.



**! DANGER:** during any type of maintenance on the batteries, the skilled technician must wear the Personal Protective Equipment (gloves, eyewear, overalls, etc.) needed to limit the risk of accidents. Keep away from naked flames, do not short circuit the battery poles, do not generate sparks and do not smoke.



**! DANGER:** in the event of battery fluid leakage, do not touch the fluid and observe the following precautions:

Contact with the skin can cause irritation; wash with soap and water.

Inhalation of vapours can cause irritation to the airways; stay out in the open air and consult a doctor.

Contact with eyes can cause irritation, wash eyes immediately and thoroughly with water for at least 15 minutes; consult a doctor.

Useful battery life is dependent on proper maintenance. To obtain best possible efficiency from batteries, observe the following rules:

- Do not leave batteries partially discharged for long periods of time.
- Allow batteries to charge completely before resuming use of the machine.
- Keep batteries clean, with the connections always well tightened.
- Check the level of the electrolyte every week (WET batteries).

### Checking the electrolyte level of WET batteries

WET batteries must be inspected periodically to check the level of the electrolyte. Use only distilled water to top up the level so that the plates are covered. Do not overfill (maximum 5 mm above the plates), as the electrolyte could expand and overflow when the battery is charged.

### Recharging the batteries



**! DANGER:** do not check the batteries by sparking. Lead-acid (WET) batteries give off flammable vapours: extinguish any naked flames or embers before checking or topping up the batteries.



**! DANGER:** carry out the operations described below in a ventilated area.



**! DANGER:** when charging the batteries, highly explosive hydrogen gas is produced. Leave the cowling open throughout the battery charging cycle and only carry out this procedure in well-ventilated areas, away from naked flames.

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

**! ATTENTION:** before recharging, make certain that the battery charger is set up correctly for the type of battery installed.

**! ATTENTION:** run the recharge cycle exactly as specified in the battery charger manual, and at the end of the cycle, detach the connectors.

### On board battery charger (OPTIONAL)

- Open the cowling.



- Connect the battery charger power cable to the mains power socket.
- Charge the batteries as instructed in the battery charger manual.
- Check charging progress on the battery charger display fitted on the cowling.



- On completion of charging, disconnect the power cable of the battery charger from the mains power socket.

### External battery charger

- Connect the battery charger cable to the machine.



- Connect the battery charger power cable to the mains power socket.
- Charge the batteries as instructed in the battery charger manual.
- On completion of charging, disconnect the power cable of the battery charger from the mains power socket.

### Battery: removal



**! DANGER:** in the event of battery fluid leakage, do not touch the fluid and observe the following precautions:

Contact with the skin can cause irritation; wash with soap and water.

Inhalation of vapours can cause irritation to the airways; stay out in the open air and consult a doctor.

Contact with eyes can cause irritation, wash eyes immediately and thoroughly with water for at least 15 minutes; consult a doctor.



**! DANGER:** When removing the batteries, the skilled technician must wear the Personal Protective Equipment (gloves, eyewear, overalls, etc.) needed to limit the risk of accidents; remove the ignition key from the control panel before proceeding with the removal operation, keep away from naked flames, do not short circuit the battery poles, do not cause sparks and do not smoke.

**! ATTENTION:** the operation of removing the batteries must be carried out by a skilled technician.

**! ATTENTION:** when removing the batteries, ensure that the battery charger is unplugged from the power socket.

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

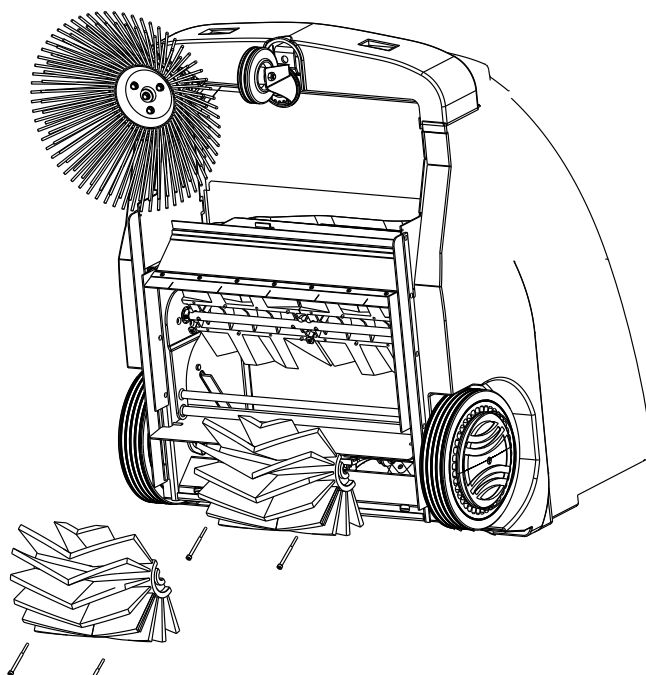
- Disconnect the battery cables and bridge terminals from the battery poles.
- If necessary, remove the devices fixing the battery to the base of the machine.
- Lift the batteries from the compartment using suitable handling equipment.

### Replacing and adjusting the centre brush

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

#### Replacement

- Open the cowling.
- Remove the battery: when undertaking this operation, refer to the section "**Battery: removal**".
- Remove the front debris bin: when undertaking this operation, refer to the section "**Emptying the debris bin**".
- Unscrew the 4 screws fixing the brush in place and remove it.
- Fit the new brush.





## ! NOTICE

While fitting the new brush, ensure that the bristles are facing the right direction, as they have to sweep the dirt towards the centre of the machine.

### Adjustment

The height of the centre brush is factory-set for a hard floor (ceramic or natural stone).

When using the machine on soft floors (carpet), turn the knob twice in a clockwise direction in order to reduce the pressure of the brush.

The brush is properly adjusted when its bristles bend slightly against the floor surface.

As the brush gradually wears down, it is important to increase this pressure in order to maintain optimum sweeping performance.



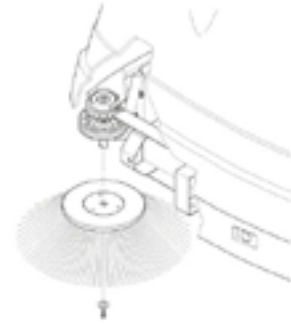
**! ATTENTION:** excessive brush pressure wears down the brush more rapidly and reduces battery life. When replacing a worn brush, it is important to reset the brush height.

### Replacing and adjusting the side brush

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

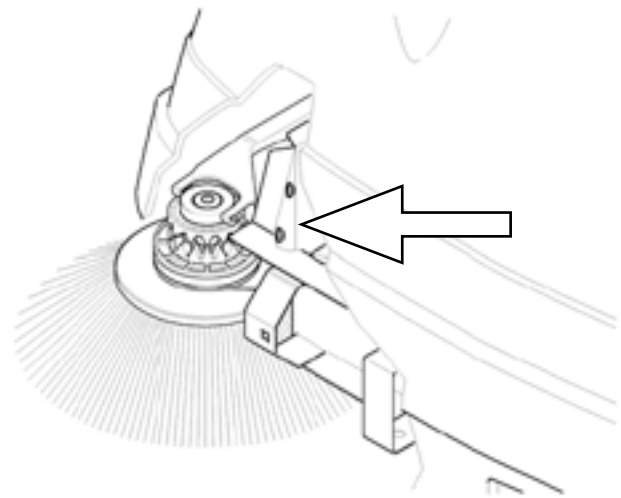
#### Replacement

- Lift the front of the machine.
- Unscrew the screw that fixes the brush in place and remove the brush.
- Replace it with the new brush and then tighten the screw, complete with washer.



### Adjustment

- Open the cowling.
- Remove the front debris bin: when undertaking this operation, refer to the section "**Emptying the debris bin**".
- Loosen the screws, manually positioning the brush at the desired height along the slots. Once having determined the correct height, tighten the two screws.



### Replacing the flaps

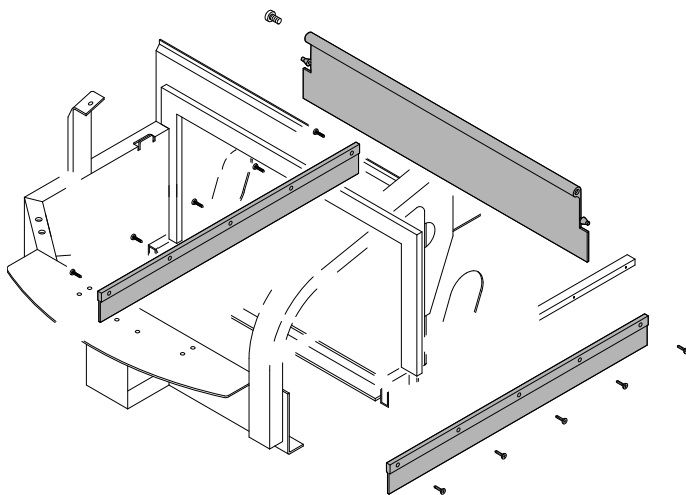
**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

#### Outer side flaps

- Open the cowling.
- Remove the rear wheels.
- Unscrew the screws fixing the flaps to the chassis
- Install the new flaps.

#### Rear flap

- Open the cowling.
- Remove the rear wheels.
- Remove the rear debris bin.
- Unscrew the two flap fixing pins.
- Hold the flap and pull it towards the outside of the machine.
- Install the new flap.



### Replacing the drive belt

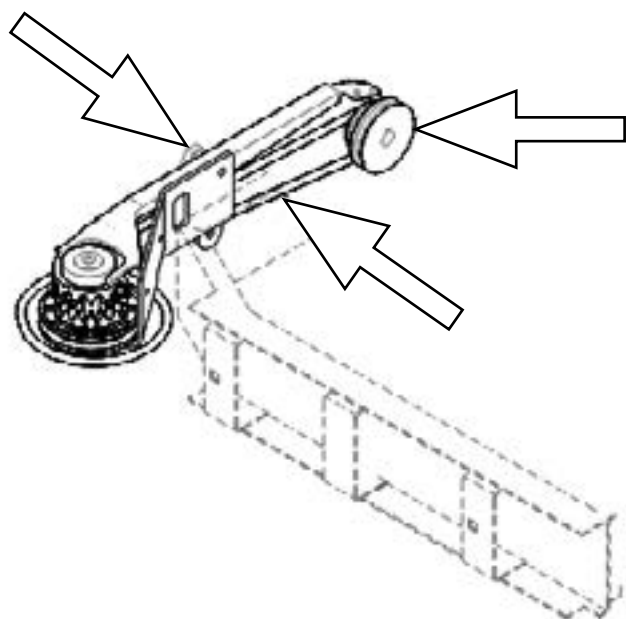
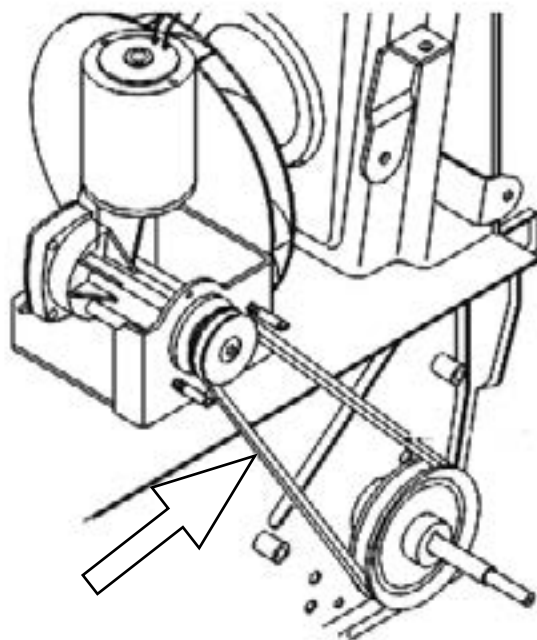
- Open the cowling.
- Remove the belt from the pulley and replace it with a new one.

### Replacing and adjusting the belt

**! ATTENTION:** before carrying out the operations described below, stop on a flat and level surface, switch off the machine, remove the ignition key and apply the parking brake, if installed.

#### Replacing the side brush belt

- Open the cowling.
- Remove the belt from the pulley.
- Unscrew the fixing pin and release the two hooks on the side arm from the idle toothed ring.
- Remove the belt from the side arm.
- Replace the belt.
- Reattach the side arm to the idle toothed ring.
- Retighten the pin.
- Slip the belt into the pulley.



### Periodic checks

CHECK	Every 10 hours	Every 50 hours	Every 100 hours	Every 200 hours
LOOSENING OF BELTS			X	
TIGHTNESS OF THE NUTS AND SCREWS		X		
CONDITIONS OF THE BRUSHES		X		
CHECKING THE TIGHTNESS OF THE GASKETS	X			
REPLACING THE FILTER				X



## **PERIODS OF INACTIVITY**

If the machine is not used for some time, for example, on display in a showroom or stored in the warehouse for a period of more than one month, the following operations are required:

- Recharge the battery completely. During long periods of inactivity, remember to recharge the batteries periodically (at least once every two months) so that they are kept at the maximum charge level.
- Disconnect the battery from the machine.
- Unplug the battery charger (if present) from the mains power supply.
- Make certain that the debris bins are completely empty and perfectly clean.

**! ATTENTION: remember to check the batteries — if they are not recharged periodically as described above, they could become damaged beyond repair. The manufacturer is not liable for any malfunctions resulting from neglect, improper and/or incorrect use.**

**! ATTENTION: when the batteries discharge to the minimum level, make certain they are not left in this condition for any length of time, as this can reduce their working life. Check the battery charge level at least once a week**

## **TROUBLESHOOTING**

PROBLEMS	CAUSES	SOLUTIONS
Centre brush does not rotate.	The gearmotor is faulty	Contact service centre
	Fuse tripped	Reset the fuse
The side brushes do not rotate.	Belt broken	Replace
The battery doesn't hold its charge	Liquid level low (WET batteries)	Top up
	Battery terminal loose	Tighten
Dust comes out of fan	Broken filter	Replace
	Filter positioned incorrectly	Reposition
	Worn gaskets	Replace
The brushes wear out too quickly	Brushes pressed too hard	Adjust
Dust released when working	Worn flaps	Replace
	Filter clogged	Clean
The suction motor does not work	The motor is faulty	Contact service centre
	Fuse tripped	Reset the fuse
The machine does not start	Battery terminals disconnected	Check
	Batteries discharged	Recharge



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