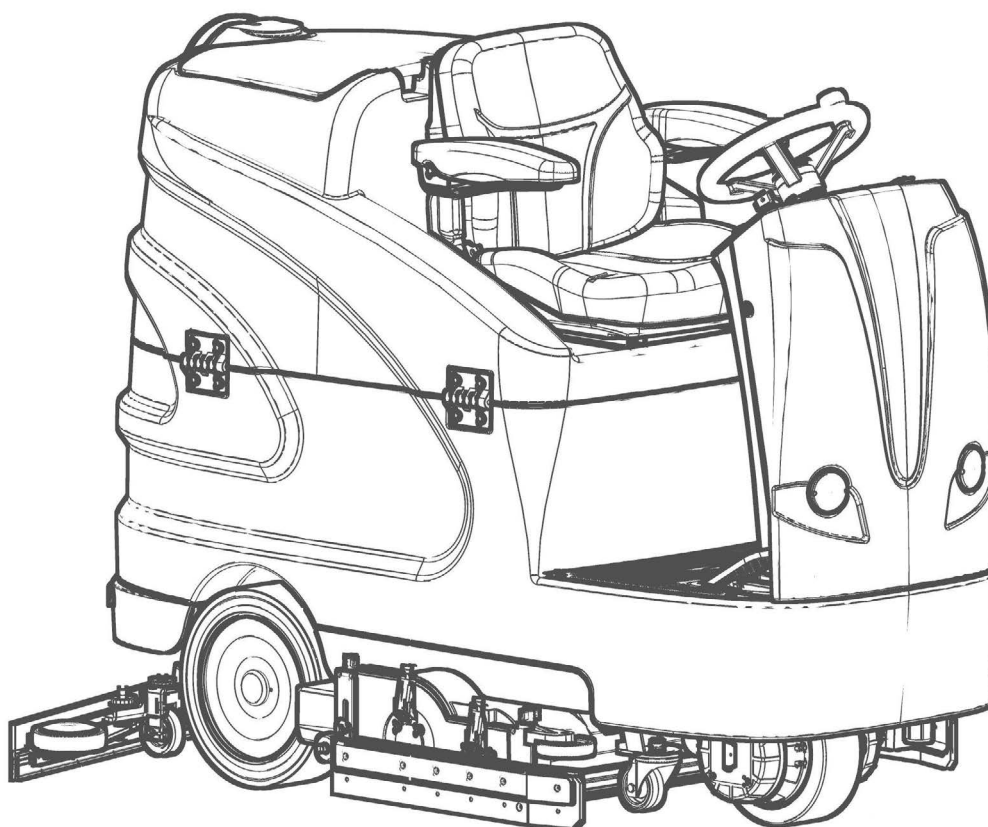




optima90



SCRUBBING MACHINES

USE AND MAINTENANCE MANUAL



CONTENTS

CONTENTS.....	3	CLEANING THE RECOVERY TANK.....	24
GENERAL SAFETY REGULATIONS.....	4	EMPTYING THE SOLUTION TANK.....	24
RECHARGING THE BATTERIES.....	4	CLEANING THE WATER SYSTEM FILTER.....	25
USING THE MACHINE.....	5	CLEANING THE VACUUM TUBE.....	25
DEACTIVATION OF THE MACHINE.....	7	CLEANING THE DETERGENT TANK (CDS VERSIONS).....	25
MAINTENANCE.....	7	EXTRAORDINARY MAINTENANCE WORK.....	26
TRANSPORT.....	9	REPLACING THE SQUEEGEE BODY RUBBER BLADES.....	26
SYMBOLS USED ON THE MACHINE.....	10	REPLACING THE BRUSH HEAD BODY BRUSHES.....	26
SYMBOLS PRESENT ON THE REGISTRATION PLATE.....	10	REPLACING THE BRUSH HEAD BODY SPLASH GUARD.....	26
SYMBOLS PRINTED ON THE MACHINE.....	10	ADJUSTMENT INTERVENTIONS.....	27
LABELS ON THE MACHINE.....	10	ADJUSTING THE SQUEEGEE BODY'S RUBBER BLADES.....	27
SYMBOLS PRESENT ON THE COMMAND PANEL.....	11	ADJUSTING THE SQUEEGEE BODY'S RUBBER BLADES.....	27
SYMBOLS PRESENT ON THE CONTROL PANEL.....	11	DISPOSAL.....	27
SYMBOLS USED IN THE MANUAL.....	12	EC DECLARATION OF CONFORMITY.....	28
PURPOSE AND CONTENT OF THE MANUAL.....	12	TROUBLESHOOTING.....	28
TARGET GROUP.....	12	BROWSING THE COMMAND DISPLAY MENU.....	29
STORING THE USE AND MAINTENANCE MANUAL.....	12		
ON CONSIGNMENT OF THE MACHINE.....	12		
INTRODUCTORY COMMENT.....	12		
IDENTIFICATION DATA.....	12		
TECHNICAL DESCRIPTION.....	12		
INTENDED USE.....	12		
SAFETY.....	12		
REGULATIONS.....	12		
SPECIAL EQUIPMENT.....	13		
SERIAL NUMBER PLATE.....	13		
TECHNICAL DATA (INTERNATIONAL SYSTEM).....	13		
TECHNICAL DATA (IMPERIAL SYSTEM).....	14		
BRUSH TYPE.....	14		
PREPARATION OF MACHINE.....	15		
HANDLING THE PACKAGED MACHINE.....	15		
HOW TO UNPACK THE MACHINE.....	15		
HOW TO MOVE THE MACHINE.....	15		
MACHINE SAFETY.....	15		
TYPE OF BATTERY TO BE USED.....	15		
BATTERY MAINTENANCE AND DISPOSAL.....	15		
RECHARGING THE BATTERIES.....	16		
FILLING THE SOLUTION TANK WITH WATER.....	16		
DETERGENT SOLUTION.....	17		
ASSEMBLING THE SQUEEGEE BODY.....	17		
USER SEAT ADJUSTMENT.....	18		
PREPARING TO WORK.....	18		
STARTING WORK.....	19		
WATER FLOW ADJUSTMENT FUNCTION.....	20		
DETERGENT SOLUTION FLOW ADJUSTMENT FUNCTION (CDS VERSION).....	20		
ECO-MODE FUNCTION.....	20		
BUZZER.....	20		
MOVEMENT SPEED ADJUSTMENT.....	20		
EXTRA-PRESSURE FUNCTION EXERTED ON THE BRUSHES.....	20		
DIPPED HEADLIGHTS.....	20		
HOUR METER.....	20		
BATTERY CHARGE LEVEL INDICATOR.....	21		
EMERGENCY BUTTON.....	21		
ALARM SCREEN.....	21		
SERVICE BRAKE.....	21		
OVERFLOW DEVICE.....	21		
AT THE END OF THE WORK.....	22		
ROUTINE MAINTENANCE.....	22		
DRAINING THE RECOVERY TANK.....	22		
EMPTYING THE DEBRIS HOPPER.....	23		
CLEANING THE SQUEEGEE BODY.....	23		
CLEANING THE RECOVERY TANK FILTER-FLOAT.....	23		
CLEANING THE BRUSH HEAD BODY BRUSHES.....	24		

GENERAL SAFETY REGULATIONS

The following symbols are used to indicate any potentially hazardous situations. Always read this information carefully and take the necessary precautions to protect any people and/or objects that may be present.

Operator cooperation is paramount for accident prevention. No accident prevention programme can be effective without the full cooperation of the person directly responsible for the machine's operation. Most accidents that occur at the workplace, during work activities, or while in transit, are caused by the failure to respect the most basic safety regulations. An attentive, careful operator is most effective guarantee against accidents and is fundamental in order to implement any prevention programme.



DANGER: Indicates an imminent danger that could cause serious injury or death.



WARNING: Indicates a probable dangerous situation that could cause serious injury or death.



CAUTION: Indicates a probable dangerous situation that could cause minor injuries.



ATTENTION: Indicates a probable dangerous situation that could damage objects.

RECHARGING THE BATTERIES



DANGER:

- If the battery charger power cable is damaged or broken, it must be replaced by the battery charger manufacturer; by an authorized Service Centre personnel or a qualified person in order to avoid hazards.
- The socket for the battery charger cable must have a prescribed earth connection.
- Keep sparks, flames, and incandescent materials at a safe distance from the batteries. Explosive gases are emitted during normal use.
- highly explosive hydrogen gas is generated while charging the batteries. Keep the seat mounting plate in the maintenance position during the entire battery recharging cycle, and only carry out the procedure in well-ventilated areas and at a safe distance from any open flames.
- Before charging check that the electric cable that connects the battery charger to the batteries is not damaged, and if it is damaged do not use it and contact technical assistance.
- Before charging check that the electric cable that connects the battery charger to the mains is not damaged, and if it is damaged do not use it and contact technical assistance.
- Do not disconnect the direct current cable of the battery charger from the socket of the machine when the battery charger is operating. This is necessary to prevent electric arcs forming. To disconnect the battery charger when it is charging, first disconnect the alternating current power cable.



WARNING:

- Do not use incompatible battery chargers since they could damage the batteries and potentially cause a fire.
- Before using the battery charger, make sure that the frequency and the voltage values indicated on the machine's data plate coincide with the network's values.

- Keep the battery charger's cable at a safe distance from any hot surfaces.
- Never smoke in the machine's vicinity while the batteries are charging.
- Before starting the charging operation, carefully read the use and maintenance manual of the batteries and the battery charger that you want to use.

USING THE MACHINE



DANGER:

- In the event of danger, quickly press the emergency button on the instrument panel.
- Never collect gases, explosive/inflammable liquids or powders, nor acids and solvents! These include gasoline, paint thinners and fuel oil (which, when mixed with the vacuum air, can form explosive vapours or mixtures), and also non-diluted acids and solvents, acetones, aluminium and magnesium powders. These substances may also corrode the materials used to construct the machine.
- If the machine is used in dangerous areas (e.g. petrol stations), the relative safety standards must be observed. It is forbidden to use the machine in environments with a potentially explosive atmosphere.



WARNING:

- The machine must be exclusively used by authorised, trained personnel.
- Do not use the machine on surfaces with a slope greater than the one indicated on the serial number plate.
- The machine is not suitable for cleaning rough or uneven floors. Do not use the machine on slopes.
- In the event of a fire, use a powder extinguisher. Do not use water.
- Adapt the speed to the adhesion conditions.
- In order to prevent the unauthorised use of the machine, the power supply must be disconnected: switch the machine off using the main switch (by removing the key from the block) and disconnect the battery's connector from the electrical system's connector.
- Do not use the machine if you do not have the requisite knowledge or authorisation.
- Do not use the machine if you have not read and understood the following user manual.
- Do not use the machine under the influence of alcohol or drugs.
- Do not use the machine when using a mobile phone or other types of electronic devices.
- Do not use the machine if it is not working correctly.
- Do not use the machine in areas where there are inflammable vapours or liquids or combustible powders.
- Do not use the machine in areas that are too dark to see the controls or operate the machine safely, unless the work lights or the front headlights are on.
- Do not use the machine in areas where there is a risk of falling objects, unless the machine is equipped with an overhead guard (optional).



CAUTION:

- Children must be supervised to ensure they do not play with the machine.
- During the working of the machine, pay attention to other people and especially to children.

- The machine must only be powered with a voltage equal to that shown on the serial number plate.
- Read the labels on the machine carefully. Do not cover them for any reason, and replace them immediately if they become damaged.
- The machine must only be used and stored in an enclosed or covered environment.
- The machine must not be used or stored outdoors in damp conditions or directly exposed to rain.
- Use the machine only in the way described in this manual.
- Do not pick up anything that is burning or smouldering, like cigarettes, matches or glowing embers.
- Reduce speed on slopes and dangerous corners.
- Reduce speed before making a turn.
- Keep all parts of your body inside when the machine is moving.
- Be careful when reversing.
- Do not transport passengers. Do not use the machine as a means of transport.
- Always follow the instructions for mixing, use and disposal on the containers of the chemical substances.



ATTENTION:

- **The appliance should not be used by people (including children) with reduced physical, sensory or mental capabilities or who do not have the necessary experience or knowledge of the appliance.**
- If the machine is to be used in the presence of other individuals, aside from the operator, the beacon light (optional) must be utilized.
- Always take appropriate measures to protect any individuals and/or objects that may be present while using this machine.
- Be careful to avoid collisions with shelving or scaffolding, above all if there is a risk of objects falling from heights.
- Do not place any liquid containers on the machine.
- The machine must only be used under temperature conditions ranging from 0 °C to +40 or +32 °F to 104 °F.
- When using detergents to clean the flooring, always follow the instructions and respect the warnings indicated on the containers' labels.
- Always use appropriate gloves and protective equipment when handling the detergents used to clean the floor.
- Avoid working with the brushes when the machine is standing still, so as not to damage the floor.
- In the event of a fire, use a powder fire extinguisher if possible, and avoid the use of water.
- Do not allow any objects to penetrate into the machine's openings. Do not use the machine if the openings are obstructed.
- Keep the machine's openings free of any dust, lint, hairs, or any other foreign materials that could reduce the airflow.
- Do not remove or alter any labels affixed to the machine.
- This machine has not been approved for use on public streets or roadways.
- This machine has not been made for external use but internal locations only.
- Only use the brushes and pad holders that have been supplied along with the machine or those specified in the Operator's Manual. The use of other brushes or felt pads could compromise the machine's safety conditions.
- Before starting to work check that there are no leaks.

- Before starting to work check that all the safety devices have been installed and are working correctly.
- Before starting work check that the brakes and steering are working correctly.
- Before starting work adjust the seat and steering wheel, and also the seat belt if there is one.

DEACTIVATION OF THE MACHINE

-  **WARNING:**
- Always protect the machine against sunlight, rain, and other atmospheric agents, both while it is stationary and while it is in function. Store the machine in a dry, sheltered place: this machine is only designed for use under dry conditions, and must not be used or stored outdoors under humid conditions.
 - Do not park the machine near combustible materials, powders, gases or liquids.
 - Stop the machine on a flat surface.
 - If the machine is left unattended, it must be protected from any accidental movements

-  **ATTENTION:**
- The machine must only be stored under temperature conditions ranging from 0 °C to +40 or +32 °F to 104 °F. The humidity level must be between 30% and 95%.

MAINTENANCE

-  **DANGER:**
- In order to avoid short-circuits when working in the vicinity of electrical components, do the following: avoid the use of non-insulated tools; do not place or allow metallic objects to fall upon the electrically powered components; remove any rings, watches and/or clothing with metallic parts that might come into contact with the electrically powered components.
 - do not work underneath the raised machine without adequate fixed safety supports.

-  **WARNING:**
- Read all the relevant instructions carefully before performing any maintenance/repair operations.
 - If the machine does not work properly, check this is not caused by failure to carry out routine maintenance. Otherwise, ask for intervention of the authorised technical assistance centre.
 - Restore all electrical connections after any maintenance interventions.

-  **CAUTION:**
- When doing maintenance work, switch off the machine using the main switch. Remove the key from the instrument panel and remove the battery connector from the electrical system connector.
 - Avoid contact with moving parts. Do not wear loose clothing or jewellery and tie long hair back.
 - Block the wheels before lifting the machine.
 - Lift the machine with equipment that can sustain the weight to be lifted.

-  **ATTENTION:**
- All maintenance operations on the machine must be carried out under sufficient visibility and lighting conditions.

- Ensure that the area used for the maintenance of the machine is well ventilated.
- Avoid contact with moving parts during machine maintenance. Do not wear loose clothing or jewellery and tie long hair back.
- Block the wheels before lifting the machine with the jack.
- Raise the machine with the jack only at the points indicated. Support the machine using the stands.
- Wear personal protective equipment as required and as suggested in the manual.
- Never tamper with the machine's protection devices for any reason; always follow the supplied routine maintenance instructions scrupulously.
- If the machine needs to be pushed for maintenance purposes (batteries absent; discharged batteries; etc.), never exceed 4 km/h or 2.49 mph.
- If any issues are encountered while using the machine, check to make sure that these are not due to a lack of proper maintenance. Otherwise, request the intervention of authorized personnel or an Authorized service centre.
- If any parts need to be replaced, always request ORIGINAL spare parts from an authorized Dealer or Retailer.
- In order to ensure the machine's safety and proper functionality, always have the scheduled maintenance interventions (specified in the appropriate section of this Manual) performed by authorized personnel or by an authorized Service Centre.
- Do not clean the machine with direct or pressurized jets of water, or with corrosive substances.
- Disconnect the battery connection and the battery charger cable before working on the machine.
- If lead batteries (WET) have been installed on the machine, avoid tilting the machine beyond 30° with respect to the horizontal plane, as this could cause the highly corrosive liquid to leak out of the batteries.
- Avoid contact with the battery acid.
- Keep all metal objects away from the batteries.
- Use a non-conductive device for removing the battery.
- Use a hoist and suitable equipment when lifting the batteries.
- The battery must be installed by qualified personnel.
- Always observe the safety measures of the site regarding removing the battery.
- Remove the batteries if the machine needs to be tilted in order to perform maintenance procedures.
- Have the machine checked by an authorised technical assistance centre every year.
- When disposing of consumable materials, observe the laws and regulations in force. Once the machine has reached the end of its service life, the materials contained within it must be disposed of in an appropriate manner, keeping in mind that the machine itself has been built using fully recyclable materials.
- Do not push or tow the machine without an operator on the seat who can control the machine.
- Do not wash the machine with pressurised water or wet the machine near electrical components.
- All repairs must be carried out by qualified personnel.
- Do not physically change the design characteristics of the machine.
- Use spare parts supplied by Comac or by Comac service centres.
- Wear personal protective equipment as required and as suggested in the manual.

TRANSPORT



WARNING:

- Use hoists or jacks capable of supporting the weight of the machine.
- Do not push or tow the machine without an operator on the seat who can control the machine.
- The ramp gradient must not be such as to cause damage to the machine as it moves up onto the vehicle or from the vehicle to the ground.
- Do not load / unload the machine from a truck or trailer unless the load height is 380 mm or 14.96 inches or less from the ground.
- Block the wheels of the machine.
- Secure the machine to the truck or trailer.
- Drain both tanks before transport.
- Bring both the squeegee and the brushes to a working position before securing the machine to the transport vehicle.
- Use a ramp, a truck or a trailer that can support the weight of the machine and the operator.



ATTENTION:

- The machine must only be stored under temperature conditions ranging from 0 °C to +40 or +32 °F to 104 °F. The humidity level must be between 30% and 95%.

SYMBOLS USED ON THE MACHINE

SYMBOLS PRESENT ON THE REGISTRATION PLATE

	Direct current symbol: Used on the appliance's registration plate to indicate that the appliance is powered by a DC power supply.
	Battery symbol: Used on the appliance's registration plates to indicate the mass of the batteries used to power the appliance (expressed in Kg). The value refers to the batteries that the manufacturer offers.
	Maximum gradient symbol: Used on the registration plate of the device, to indicate the maximum gradient that can be safely handled by the device in work mode.

SYMBOLS PRINTED ON THE MACHINE

	Solution tank drain pipe symbol: Located on the rear part of the machine, to identify the solution tank drainage tube.
	Recovery tank drainage hose symbol: Located on the rear part of the machine, to identify the recovery tank drainage tube.
	Cap/filter position symbol: Used on the rear of the device to indicate the position of the solution tank cap/filter.
	Symbol of maximum temperature for filling the solution tank: Used on the side of the device, to indicate the maximum temperature of the water for filling the solution tank safely.

LABELS ON THE MACHINE

	Label for detergent flow solution tap control. This is used near the driver's seat to indicate how to position the lever if you want to activate or deactivate the flow of detergent solution within the circuit of the machine's water system.
	Label indicating that the reading of the use and maintenance manual is compulsory: This is used in the rear part of the steering column to warn the user to read the use and maintenance manual (the present document) before using the machine for the first time.
	Label prohibiting the vacuuming of flammable or incandescent substances: This is used in the rear part of the steering column to warn the user that there is an absolute obligation not to vacuum flammable or incandescent substances..
	Gas leakage warning label during battery charging: This is used in the rear part of the steering column to warn the user to keep harmful and flammable gases from generating during the battery charge cycle.
	Solution tank filter daily care warning label: This is used in the front left side of the machine to warn the user to clean the solution tank filter after each use of the machine.
	Daily care and battery recharge warning label: This is used in the rear part of the steering column to warn the user on how to recharge the batteries, and the daily care of the machine is explained in the lower part.
	Detergent solution flow rate value label: Used on the rear part of the steering column to indicate the variation of the "detergent solution quantity level" symbols in the machine's water circuit.
	Label warning about the risk of crushed hands: Indicates danger to hands due to crushing between two surfaces.
	pH label (versions with on-board automatic detergent dosing system): Affixed above the detergent tank to indicate the pH range of the chemical product to be utilized.
	Detergent tank correct positioning label (versions with on-board automatic detergent dosing system): Positioned inside the solution tank, near the compartment containing the detergent canister, to indicate the correct positioning of the detergent canister or the distribution pipe.
	Water system use warning label with on-board automatic detergent dosing system: This is used on the machine to warn the user on which chemical products to use.
	Detergent solution flow-rate value label (versions with on-board automatic detergent dosing system): Used on the rear part of the steering column to indicate, on the top line, the variation of the "detergent percentage value" symbols in the machine's water circuit. While the bottom line indicates the variation of the "detergent solution quantity level" symbols present in the machine's water circuit.



Braking system oil level check label:

Located near the braking system oil basin, to remind the operator to check the level of oil in the basin.
The bottom part of the label shows the recommended oil for the braking system.

SYMBOLS PRESENT ON THE COMMAND PANEL



Main switch symbol:

Used on the command panel to indicate in which direction to turn the key to activate or deactivate the machine's general switch.



i-drive selector symbol:

Indicates the command knob for the i-drive program selector.



Open book caution symbol:

Used in the control panel to tell the operator to read the manual before using the machine.



Machine movement direction symbol:

Used on the control panel to indicate the direction of the machine.

SYMBOLS PRESENT ON THE CONTROL PANEL



ECO-MODE symbol:

Used on the control panel to indicate the button that activates or deactivates the ECO-MODE of the machine.



Buzzer symbol:

Indicates the buzzer command button.



Detergent solution quantity regulation symbol:

Used on the control panel to indicate the button regarding the regulation of the detergent solution level within the machine's water circuit.



Front headlights control symbol:

Used on the control panel to indicate the button that regulates the machine's front headlights.



Regulation symbol denoting pressure applied to the brushes:

Used on the control panel to indicate the button that regulates the weight exerted by the brushes on the floor.



Detergent percentage regulation symbol (versions with on-board automatic detergent dosing system):

Used on the control panel to indicate the button regarding the regulation of the detergent percentage within the machine's water circuit.



Forward speed level regulator symbol:

Used on the control panel, to indicate the button that allows you to regulate the movement speed of the machine.

The descriptions contained in this document are not binding. The company therefore reserves the right to make any modifications at any time to elements, details, or accessory supply, as considered necessary for reasons of improvement or manufacturing/commercial requirements. The reproduction, even partial, of the text and drawings contained in this document is prohibited by law.

The company reserves the right to make any technical and/or supply modifications. The images are shown as reference only and are not binding as to the actual design and/or equipment.

SYMBOLS USED IN THE MANUAL

	Symbol of the open book with i: Indicates the need to consult the instruction manual.		Danger symbol (moving carriages): Indicates that the packed product should be handled with suitable carriages that conform to legal requirements.
	Symbol of the open book: Tells the operator to read the user manual before using the device.		Mandatory room ventilation symbol: Informs the operator that the room must be ventilated while the batteries are being recharged.
	Covered place symbol: The operations preceded by this symbol must always be carried out in a dry, covered area.		Symbol indicating the compulsory use of protective gloves: Indicates that the operator should always wear protective gloves, to avoid the risk of serious injury to his hands from sharp objects.
	Information symbol: Indicates additional information for the operator, to improve the use of the device.		Symbol indicating the compulsory use of tools: Informs the operator of the need to use tools not included with the machine.
	Warning symbol: Carefully read the sections preceded by this symbol meticulously following the instructions indicated for the safety of the operator and the device.		Symbol indicating a treading ban: Informs the operator that it is forbidden to tread on machine components, as this could lead to serious injury.
	Danger symbol (corrosive substances): The operator should always wear protective gloves to avoid the risk of serious injury to the hands caused by corrosive substances.		Recycling symbol: Tells the operator to carry out the operations in compliance with environmental regulations in force in the place where the appliance is being used.
	Danger symbol (battery acid leakage): Indicates the danger of leaking acid or acid fumes from the batteries while they are being recharged.		Disposal symbol: Carefully read the sections marked with this symbol for disposing of the appliance.

PURPOSE AND CONTENT OF THE MANUAL

The aim of this manual is to provide customers with all the information needed to use the machine in the safest, most appropriate and most autonomous way. This includes information concerning technical aspects, safety, operation, downtime, maintenance, spare parts and scrapping. The operators and qualified technicians must carefully read the instructions in this manual before carrying out any operations on the machine. If in doubt about the correct interpretation of instructions, contact your nearest Customer Service Centre to obtain the necessary clarifications.

TARGET GROUP

This manual is written both for operators and for qualified machine maintenance technicians. Operators must not perform operations that should be carried out by qualified technicians. The manufacturer is not liable for damages resulting from failure to comply with this veto.

STORING THE USE AND MAINTENANCE MANUAL

The Use and Maintenance Manual must be stored in its special pouch close to the machine, protected from liquids and anything else that could compromise its legibility.

ON CONSIGNMENT OF THE MACHINE

When the machine is consigned to the customer, an immediate check must be performed to ensure all the material mentioned in the shipping documents has been received, and also to check the machine has not suffered damage during transportation. If this is the case, the carrier must ascertain the extent of the damage at once, informing our customer service office. It is only by prompt action of this type that the missing material can be obtained, and compensation for damage successfully claimed.

INTRODUCTORY COMMENT

Any floor scrubbing machine can only work properly and effectively if used correctly and kept in full working order by performing the maintenance operations described in the attached documentation. We therefore suggest you read this instruction booklet carefully and read it again whenever difficulties arise while using the machine. If necessary, remember that our assistance service (organised in collaboration with our dealers) is always available for advice or direct intervention.

IDENTIFICATION DATA

For technical assistance or to request replacement parts, always give the model, the version and the serial number (written on the relevant plate).

TECHNICAL DESCRIPTION

The **Optima** is a floor scrubbing machine that can handle a wide variety of floors and types of dirt by using the mechanical action of two cylindrical brushes and the chemical action of a water-detergent solution. As it advances, it collects the dirt that has been removed and the detergent solution not absorbed by the floor.

The machine must only be used for this purpose.

INTENDED USE

This scrubbing machine was designed and built for the cleaning (scrubbing and drying) of smooth, compact flooring in the commercial, residential and industrial sectors by a qualified operator in proven safety conditions. The scrubbing machine is not suitable for cleaning rugs or carpet floors. It is only suitable for use in closed (or at least covered) places.



ATTENTION: The machine is not suitable for use in the rain, or under water jets.



IT IS FORBIDDEN to use the machine for picking up dangerous dusts or inflammable liquids in places with an explosive atmosphere. In addition, it is not suitable as a means of transport for people or objects.

SAFETY

Operator cooperation is paramount for accident prevention. No accident prevention programme can be effective without the full cooperation of the person directly responsible for machine operation. The majority of occupational accidents that happen either in the workplace or whilst moving are caused by failure to respect the most basic safety rules. An attentive, careful operator is most effective guarantee against accidents and is fundamental in order to implement any prevention programme.

REGULATIONS

All references to forwards and backwards, front and rear, right and left indicated in this manual should be understood as referring to the operator in a driving position with his hands on the steering wheel.

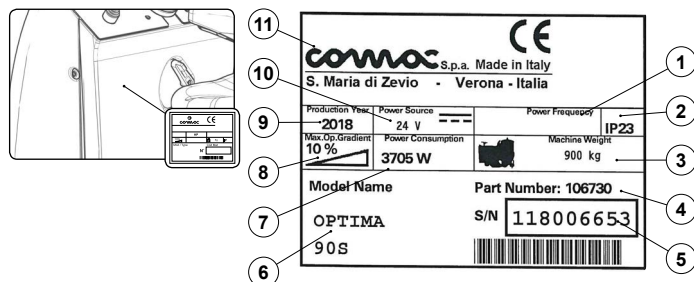
SPECIAL EQUIPMENT

Each design is created with the aim of giving the customer a new reason to choose Comac spa products, this type of scrubbing machines in particular can be equipped with the following devices:

- **ECO-MODE:** a device that decreases the noise level and lowers energy consumption.
The paragraphs in the document that talk about the following equipment will have the wording "ECO-MODE".
- **COMAC DOSING SYSTEM:** this is the dosing system for the separate management of water and detergent, and allows you to increase or reduce the delivery depending on the dirt to be treated.
The paragraphs in the document that talk about the following equipment will have the wording "CDS".
- **PRESSURE MONITORING:** a system that monitors the power dispensed by the brush motors in order to guarantee maximum effectiveness on any type of floor.
The paragraphs in the document that talk about the following equipment will have the wording "PM".
- **COMAC FLEET CARE:** system that allows the remote control of machines status: if, when and where each machine is operating or if maintenance is needed, to let you promptly intervene avoiding machine downtimes and unexpected costs for extraordinary maintenance.

SERIAL NUMBER PLATE

The serial number plate is located at the rear of the steering column, and indicates the machine's general characteristics, including its serial number. The serial number is a very important piece of information and should always be provided together with any request for assistance or when purchasing spare parts. The serial number plate contains the following:



1. The weight of the batteries used to power the appliance (expressed in Kg).
2. The IP protection rating of the appliance.
3. The gross weight of the appliance (expressed in Kg).
4. The identification code of the appliance.
5. The serial number of the appliance.
6. The name of the appliance.
7. The nominal power consumed by the appliance (expressed in W).
8. The maximum grade that the appliance can handle during work activities (expressed in %).
9. The year in which the appliance was manufactured.
10. The nominal voltage of the appliance (expressed in V).
11. The commercial name of the appliance and the manufacturer's address.

TECHNICAL DATA (INTERNATIONAL SYSTEM)	U/M	OPTIMA 90BS
Rated power	W	3340
Working width	mm	870
Squeegee width	mm	1120
Working capacity, up to	m ² /h	6960
Diameter and width of front brush	Ø mm x mm	150 x 855
Diameter and width of rear brush	Ø mm x mm	210 x 865
Front brush rotations	rpm	810
Rear brush rotations	rpm	590
Electrical characteristics of the brush motor	V/W	24 / 1500
Maximum weight of the brushes	kg	86
Electrical characteristics of the traction motor	V/W	24 / 1000
Maximum forward speed	Km/h	8
Maximum gradient with full load	%	10
Electrical characteristics of the vacuum motor	V/W	24 / 420
Suction vacuum (hole Ø0)	mbar	85
Solution tank volume	l	156
Recovery tank volume	l	138
Detergent tank volume (version with dosing system only)	l	5
Debris hopper volume	l	10
Turning circle	mm	1010
Maximum machine length (without bumper kit)	mm	1796
Maximum machine height (without roof)	mm	1005
Maximum machine width (without squeegee)	mm	900
Battery Compartment Dimensions (Length x Width x Height)	mm	430x630x470
Rated battery voltage	V	24
Battery hopper weight	kg	238
Machine weight	kg	363
Transported machine weight	kg	620
Machine weight in running order	kg	895
Sound pressure level (ISO 11201)	dB (A)	65.4
Uncertainty Kp _A	dB (A)	1.5
Body vibration level	m/s ²	< 0.5

TECHNICAL DATA (IMPERIAL SYSTEM)	U/M	OPTIMA 90BS
Rated power	W	3340
Working width	in	34.25
Squeegee width	in	44.09
Working capacity, up to	sq.ft/h	74916.81
Diameter and width of front brush	Ø in x in	5.91 x 33.66
Diameter and width of rear brush	Ø in x in	8.27 x 34.06
Front brush rotations	rpm	810
Rear brush rotations	rpm	590
Electrical characteristics of the brush motor	V/W	24 / 1500
Maximum weight of the brushes	lb	189.6
Electrical characteristics of the traction motor	V/W	24 / 1000
Maximum forward speed	mph	4.97
Maximum gradient with full load	%	10
Electrical characteristics of the vacuum motor	V/W	24 / 420
Suction vacuum (hole Ø0)	mbar	85
Solution tank volume	gal	34.32
Recovery tank volume	gal	30.36
Detergent tank volume (version with dosing system only)	gal	1.1
Debris hopper volume	gal	2.2
Turning circle	in	39.76
Maximum machine length (without bumper kit)	in	70.71
Maximum machine height (without roof)	in	39.57
Maximum machine width (without squeegee)	in	35.43
Battery Compartment Dimensions (Length x Width x Height)	in	16.93x24.8x18.5
Rated battery voltage	V	24
Battery hopper weight	lb	524.7
Machine weight	lb	800.28
Transported machine weight	lb	1366.87
Machine weight in running order	lb	1973.14
Sound pressure level (ISO 11201)	dB (A)	65.4
Uncertainty Kp _A	dB (A)	1.5
Body vibration level	m/s ²	< 0.5

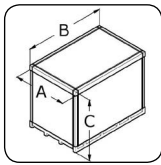
BRUSH TYPE					
MACHINE	CODE	QTY	Ø EXTERNAL	TYPE OF BRISTLE	NOTES
OPTIMA 90BS	439098	1	150 mm	PPL 0.7	WHITE FRONT BRUSH
	439099	1	150 mm	PPL 1	BLACK FRONT BRUSH
	404628	1	210 mm	PPL 0.7	WHITE REAR BRUSH
	404630	1	210 mm	PPL 1	BLACK REAR BRUSH
	404631	1	210 mm	ABRASIVE	REAR BRUSH

PREPARATION OF MACHINE

HANDLING THE PACKAGED MACHINE

Gross weight of machine with packaging is:

- Optima 90BS= 410 Kg or else 904 lb



The overall dimensions of the package are:

- A= 1130 mm or 44.49 in
- B= 1880 mm or 74.02 in
- C= 1627 mm or 64.06 in



ATTENTION: It is recommended that all the packaging components be kept for any future machine transportation.

ATTENTION: Move the packaged product with handling equipment that complies with legal requirements regarding size and mass of the packaging.

HOW TO UNPACK THE MACHINE

The machine is shipped in specific packaging. To remove it, proceed as follows:

1. Place the lower part of the outer packaging in contact with the floor.



N.B.: Use the pictograms printed on the box as a reference.

2. Remove the outer package.



WARNING: The machine is contained in specific packaging materials, whose elements (plastic bags, staples, etc.) can pose potential hazards, and must not be left within reach of children, disabled persons, etc.



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

3. Insert a ramp in the rear part of the machine.



ATTENTION: The ramp gradient must not be such as to cause damage to the machine as it comes down.

4. The machine is fastened to the platform with wedges, remove these wedges.
5. Take the machine off the pallet via the ramp.



CAUTION: During this operation, check there are no people or objects near the machine.

HOW TO MOVE THE MACHINE

To transport the machine safely, proceed as follows:

1. Check to make sure that the solution tank and the recovery tank are empty. If this is not the case, empty them (see the sections titled ["EMPTYING THE SOLUTION TANK"](#) and ["EMPTYING THE RECOVERY TANK"](#)).
2. Place the machine on the transport vehicle.



WARNING: Secure the device according to the directives in force in the country of use (ex. 2014/47/EU), so that it cannot slide or tip over.

MACHINE SAFETY

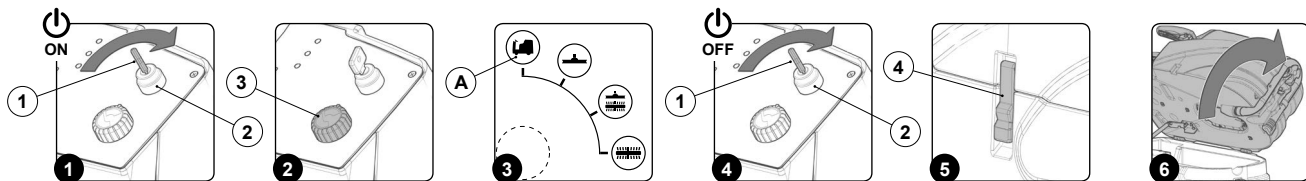
The procedure for securing the machine, thus allowing the operations to be performed under conditions of complete safety, is as follows:

1. Check that the recovery tank is empty, otherwise read paragraph ["EMPTYING THE RECOVERY TANK"](#).
2. Sit on the driver's seat.
3. Insert the key (1) into the main switch (2) on the control panel. Bring the main switch (2) to position "I" by turning the key a quarter turn clockwise (Fig. 1).
4. Use the i-drive command knob (3) (Fig. 2) to select the "transfer" program (A) (Fig. 3).

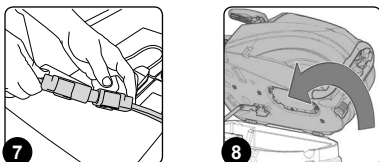


N.B.: In this way, both the brush head body and the squeegee body will move to their idle position.

5. Bring the main switch to its "0" position by turning the key (1) a quarter turn anti-clockwise (Fig. 4). Remove the key from the main switch.
6. Unhook the tank rotation latch (4) (Fig. 5) and turn the recovery tank into the maintenance position (Fig. 6).



7. Disconnect the battery connector from the machine's main system connector (Fig. 7).
8. Rotate the recovery tank into the working position (Fig. 8). Block the rotation with the latch (4) (Fig. 5).



TYPE OF BATTERY TO BE USED

The batteries must meet the requirements laid out in the norms: DIN/EN 60254-2 and IEC 254-2-2 (L range).

To carry out the work well the machine must have a 24V power supply, we recommend using a 24V 320Ah/C₈ traction battery box.

BATTERY MAINTENANCE AND DISPOSAL

For battery maintenance and recharging, respect the instructions provided by the battery manufacturer.

When the batteries reach the end of their working life, they must be disconnected by expert, trained personnel then removed from the battery compartment with the aid of suitable lifting devices.



N.B.: Dead batteries are classified as dangerous waste and as such must be delivered to an authorised body for disposal.

RECHARGING THE BATTERIES

The batteries must be charged prior to the first use, and when they don't provide enough power for tasks that could formerly be performed without difficulty.

⚠ ATTENTION: To avoid any permanent damage to the batteries, it is essential to avoid their complete discharge; begin recharging them within a few minutes of noting the "discharged batteries" signal.

⚠ ATTENTION: Never leave the batteries completely run down, even if the machine is not being used.

To recharge the batteries, proceed as follows:

1. Bring the machine to the battery recharging area.

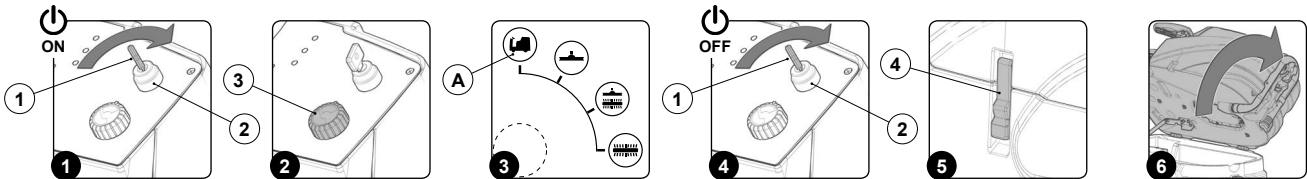
🏠 N.B.: Park the machine in an enclosed place, on a flat and level surface; near the machine there must be no objects that could either damage it, or be damaged through contact with it.

⚠ WARNING: The battery recharging area must comply with the requisites of Standard CEI EN 50272-3, or those currently in force in the country of use.

2. Check that the recovery tank is empty, otherwise read paragraph "EMPTYING THE RECOVERY TANK".
3. Sit on the driver's seat.
4. Insert the key (1) into the main switch (2) on the control panel. Bring the main switch (2) to position "I" by turning the key a quarter turn clockwise (Fig. 1).
5. Use the I-drive command knob (3) (Fig. 2) to select the "transfer" program (A) (Fig. 3).

ⓘ N.B.: In this way, both the brush head body and the squeegee body will move to their idle position.

6. Bring the main switch to its "0" position by turning the key (1) a quarter turn anti-clockwise (Fig. 4). Remove the key from the main switch.
7. Unhook the tank rotation latch (4) (Fig. 5) and turn the recovery tank into the maintenance position (Fig. 6).



8. Disconnect the battery connector from the machine's main system connector (Fig. 7).

⚠ ATTENTION: The following operations must be carried out by qualified personnel. An incorrect connection of the connector may cause problems with machine functioning.

9. Connect the external battery charger cable to the battery connector.

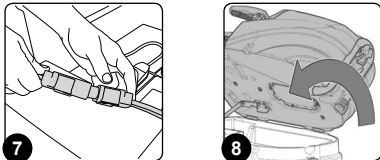
ⓘ N.B.: The coupling connector of the battery charger is consigned inside the bag containing this instruction booklet, and must be assembled on the cables of the battery charger as indicated in the instructions.

⚠ CAUTION: Before connecting the batteries to the battery charger, make sure it is suitable for the batteries used.

📖 CAUTION: Carefully read the Use and Maintenance Manual of the battery charger used for recharging.

⚠ CAUTION: Keep the battery inspection carter open for the duration of the battery recharging cycle to allow gas fumes to escape.

10. When the recharge cycle is complete, disconnect the external battery charger cable from the battery connector.
11. Connect the battery connector to the machine's main system connector.
12. Rotate the recovery tank into the working position (Fig. 8). Block the rotation with the latch (4) (Fig. 5).



FILLING THE SOLUTION TANK WITH WATER

Before filling the solution tank, carry out the following steps:

1. Take the machine to the usual place for filling the solution tank.
2. Perform the procedure for securing the machine (see the section titled "SECURING THE MACHINE").
3. Check to make sure that the solution tank drainage cap (1) is closed. If this is not the case, close it (Fig. 1).
4. Check to make sure that the water system's filter cap (2), located on the front left-hand side of the machine, is closed, and close it if necessary (Fig. 2).
5. Fill with clean water, at a temperature no higher than 50°C (122°F) and no lower than 10°C (50°F).
6. Check the water level through the tube (3) located under the operator's seat (Fig. 3).

The tank can be filled with water in the following ways:

A) filling through the side inlet:

- Remove the cap (4) on the side of the machine (Fig. 4), fill the solution tank using a hose or a bucket.
- Before filling the tank, check that the filter (5) is correctly positioned above the inlet (Fig. 4).

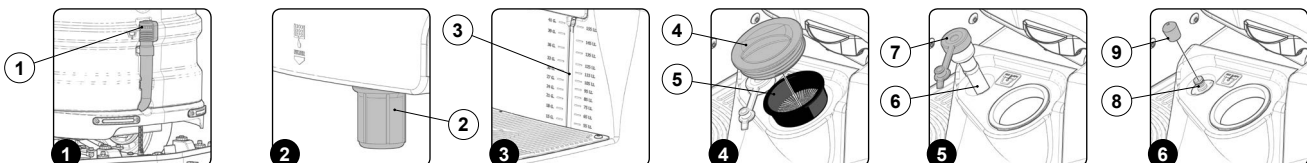
B) filling through the quick filling pipe:

- Remove the filler pipe (6) from its housing (Fig. 5), remove the closure cap (7) and insert inside the water filler pipe.
- Remember to remove the cap (4) so the air can be properly vented.

ⓘ N.B.: The filler pipe (6) supports the water filler pipe.

C) filling through the optional quick filling kit:

- Remove the cap (8) positioned above the quick coupling (9) (Fig. 6), insert the water filler pipe into the quick coupling.
- Remember to remove the cap (4) so the air can be properly vented.



DETERGENT SOLUTION

After filling the solution tank with clean water add the liquid detergent to the tank in the concentration and manner indicated on the detergent manufacturer's label. To prevent the formation of an excessive amount of foam that could damage the vacuum motor, use the minimum percentage of detergent required.

-  **CAUTION:** Protective gloves should always be worn when handling detergents or acidic or alkaline solutions, to avoid serious injury to the hands.
-  **ATTENTION:** Always use detergents whose manufacturer's label indicates their suitability for scrubbing machines. Do not use acid or alkaline products or solvents without this indication.
-  **N.B.:** Always use low-foam detergent. To avoid the production of foam, put a minimum quantity of antifoam liquid in the recovery tank before starting to clean. Do not use pure acids.

For versions with automatic management system of chemical products, fill the solution tank with clean water and then proceed as follows:

1. Bring the machine to the area designated for refilling the solution tank.
2. Make sure the machine has been secured (see the section titled "[SECURING THE MACHINE](#)").
3. Unhook the tank rotation latch (1) (Fig. 1) and turn the recovery tank into the maintenance position (Fig. 2).
4. Disconnect the male insert (2) from the female insert (3) present on the cap (4) for the detergent tank (5) (Fig. 3).

 **NOTE:** Before pulling on the male insert, push the lever on the female insert.

5. Gripping the handle (6) on the detergent canister (5), remove the canister from the compartment in the solution tank (Fig. 4).
6. Remove the cap (4) from the detergent canister (5) (Fig. 5).
7. Fill the canister with the desired detergent, as shown on the label supplied with the appliance.

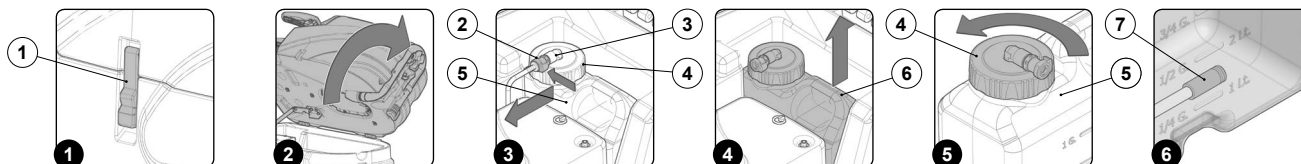
 **CAUTION:** Protective gloves should always be worn before handling detergents or acidic or alkaline solutions, to avoid serious injury to the hands.

 **N.B.:** Always use low-foam detergent. To avoid the production of foam, put a minimum quantity of antifoam liquid in the recovery tank before starting to clean. Do not use pure acids.

 **ATTENTION:** Always use detergents whose manufacturer's label indicates their suitability for scrubbing machines. Do not use acid or alkaline products or solvents without this indication.

 **ATTENTION:** The dosing system is suitable for frequent maintenance cleaning. Acid or alkaline maintenance detergent tank be used with pH values between 4 and 10 and that do not contain: oxidising agents, chlorine or bromine, formaldehyde, mineral solvents. The detergents used must be suitable for use with scrubbing machines. Wash the circuit with water after use if the system is not used daily. The system can be excluded. In case of sporadic use of detergents with pH between 1-3 or 11-14, use the floor scrubbing machine in the traditional way by adding the detergent in the clean water tank and excluding the dosing circuit.

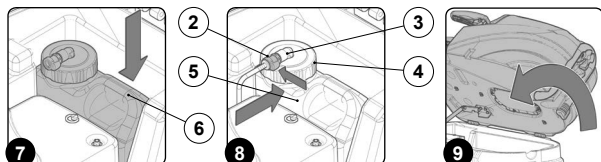
8. Make sure you tighten the cap (4) properly to avoid any leakage of liquid while working. Make sure the detergent suction filter (7) is correctly positioned on the bottom of the canister (Fig. 6).



9. Gripping the canister handle (6), place the canister (5) back in its compartment inside the solution tank (Fig. 7).

 **ATTENTION:** Position the detergent canister (8) as shown in figure (Fig. 7). To help, refer to the label located near the water system pumps support box.

10. Connect the male insert (2) to the female insert (3) in the cap (4) of the detergent canister (5) (Fig. 8).
11. Turn the recovery tank until it is closed in the working position (Fig. 9), tighten the tank rotation latch (1) in order to prevent accidental rotation.



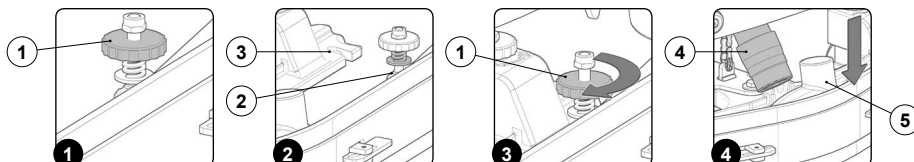
ASSEMBLING THE SQUEEGEE BODY

For packaging reasons, the squeegee body comes disassembled from the machine. To assemble it on the squeegee body support, proceed as follows:

1. Perform the procedure for securing the machine (see the section titled "[SECURING THE MACHINE](#)").

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

2. Unscrew the knobs (1) in the squeegee body pre-assembly (Fig. 1).
3. Insert the right pin (2) on the squeegee body into the right slit (3) in the squeegee support (Fig. 2), making sure that the washer and spring adhere to the top of the squeegee support.
4. Repeat the same operation for the left knob.
5. Tighten the knobs (1), ensuring that the washer and spring adhere to the top part of the squeegee support (Fig. 3).
6. Insert the vacuum tube (4) in the sleeve (5) in the squeegee body (Fig. 4).



 **N.B.:** Although the squeegee comes pre-adjusted, it is nevertheless recommended to read the section titled "[ADJUSTING THE SQUEEGEE BODY'S RUBBER BLADES](#)".

USER SEAT ADJUSTMENT

The proper adjustment of the driving position provides a greater sense of comfort when using the machine.

Seat backrest adjustment: Make sure you sit upright and that your back and that your lower back and spine are at 90°. Use the lever (1) located on the left side of the seat (**Fig. 1**) to adjust the backrest of the seat.

Driving position adjustment: The seat should always be positioned using the pedals as a reference. Act on the lever (2) located on the lower part of the seat (**Fig. 2**) to adjust the seat sitting.

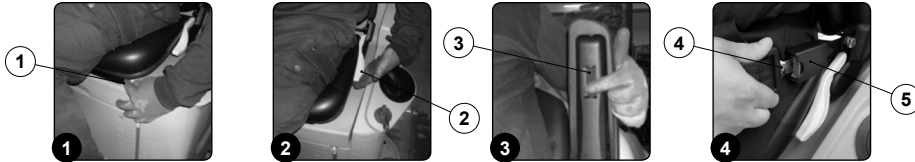
- (i) N.B.:** The distance should be adjusted so that with the pedals fully pressed to the floor the knees are slightly bent (about 120°).
- (i) N.B.:** Adjust the distance of the seat so that when pressing the brake pedal it goes as far as it can. This operation should be done with the machine running so as to pressurise the braking system.
- (i) N.B.:** If the knee is not bent enough, it is too far from the steering wheel, if however the knee is bent almost 90° then it is too close to the steering wheel.
- (i) N.B.:** The feet should be positioned keeping the heels on the footrest, the sole of the foot directly below the fingers should push the pedals.
- (i) N.B.:** The ideal driving position is that which allows you to grip the steering wheel correctly with the palms slightly lower than the shoulders. With a good grip on the steering wheel, the elbows should be bent by about 120°. They should be at least 30 cm or 11.81 in between the middle of the steering wheel and our breastbone. In any case, this distance should be no more than 45 cm or 17.72 in.

Adjusting the armrests (optional): The armrests should be inclined to make using the machine comfortable.

- (i) N.B.:** To adjust the armrest use the runner (3) under it (**Fig. 3**).
- (i) N.B.:** Taking the right armrest as a reference, if the wheel is turned outwards the inclination of the armrest is increased. Taking the left armrest as a reference, if the wheel is turned inwards the inclination of the armrest is increased.

Wear the seatbelt correctly (optional): The machine has a sub-abdominal safety device that allows the operator to be anchored to the driver's seat. To secure the safety belt, first of all you need to be sitting in the driver's seat, take the mobile part (4) of the belt, wrap it round the abdomen and insert the mobile part (4) in the slit in the fixed part (5) (**Fig. 4**).

- (i) N.B.:** Adjust the horizontal part of the belt so it is as tight as possible on the pelvis. The belt should be pulled and put as low as possible on the pelvis bone, and not on the belly.



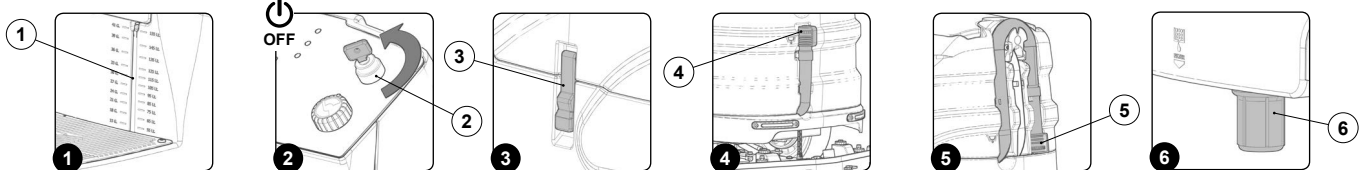
PREPARING TO WORK

Before beginning to work, it is necessary to:

1. Make sure the recovery tank is empty. If this is not the case, empty it (read ["EMPTYING THE RECOVERY TANK"](#)).
2. Check that the amount of detergent solution in the solution tank is sufficient for the type of work to be performed. If it isn't, top up the solution tank (see ["FILLING THE SOLUTION TANK WITH WATER"](#) and ["DETERGENT SOLUTION"](#)). Check the level tube (1) located near the operator's seat (**Fig. 1**).
3. Check the rubber squeegee blades are in good working condition. If they aren't, replace them (see ["REPLACING THE SQUEEGEE BODY RUBBER BLADES"](#)).
4. [Check the brush is in good working condition. If it isn't, replace it \(see "REPLACING THE BRUSH HEAD BODY BRUSHES"\).](#)
5. Check that the machine is off, otherwise set the main switch (2) to "0" by turning the key a quarter turn anti-clockwise (**Fig. 2**). Remove the key from the instrument panel.
6. Unhook the tank rotation latch (3) (**Fig. 3**) and turn the recovery tank into the maintenance position.
7. Connect the battery connector to the machine's main system connector.

! ATTENTION: This process must be carried out by qualified personnel.

8. Rotate the recovery tank into the work position. Block the rotation with the latch (3).
9. Check that the solution tank drainage pipe cap (4) is closed. If this is not the case, close it (**Fig. 4**).
10. Make sure the cap of the recovery tank drainage tube (5) is closed. If it isn't, close it (**Fig. 5**).
11. Make sure the water system filter cap (6) is closed. If it isn't, close it (**Fig. 6**).



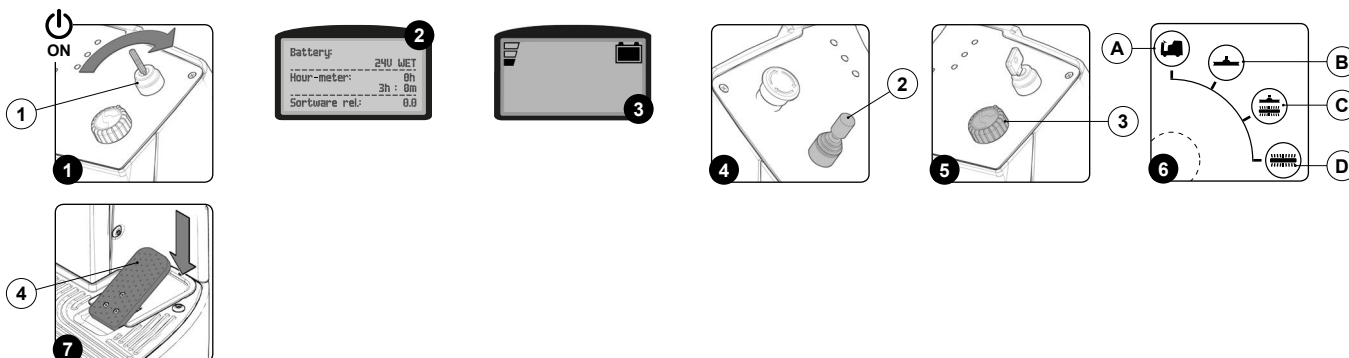
12. Make sure the vacuum tube (7) is correctly connected to the sleeve (8) in the squeegee body. If it isn't, connect it (**Fig. 7**).
13. Check that the recovery tank cover is correctly positioned, otherwise position it correctly in the upper part of the recovery tank.



STARTING WORK

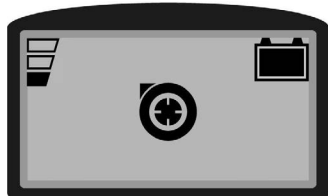
To start working, do as follows:

1. Make all the checks listed in "PREPARING TO WORK".
2. Sit in the driver's seat, to adjust the driving position read paragraph "USER SEAT ADJUSTMENT".
3. Move the main switch (1) to position "I" and turn the key a quarter turn clockwise (Fig. 1).
4. When the display comes on, three screens appear in sequence:
 - The first screen displayed indicates the logo of the manufacturer of the machine.
 - The second screen displayed indicates the name of the machine.
 - The third screen displayed (Fig. 2) indicates the characteristics of the machine's programming.
 - The forth screen displays (Fig. 3) identifies the work panel.
5. Select the movement direction using the selector switch (2) (Fig. 4).
6. Select one of the following work functions (Fig. 6) by means of the knob (3) (Fig. 5):
 - A. Transfer
 - B. Drying
 - C. Scrubbing with drying
 - D. Scrubbing without drying
7. Press the forward movement pedal (4) (Fig. 7) to begin moving the machine.



Transfer function:

The machine can be moved from one work area to another with the selector switch in transfer mode. The only main actuator active is that of the traction hub motor.

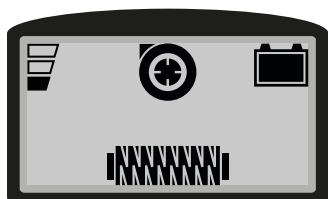


Drying function:

With the selector in drying mode it is possible to dry the previously washed portion of the floor. The main actuators active are those of the traction hub motor and the vacuum motor. When the drive pedal is pressed, the squeegee is brought into working position (in contact with the floor) and the vacuum motor will start working in full working order. If the machine is stopped and the drive pedal is released during the operation, the squeegee body will remain in contact with the floor for a few seconds, after which it will raise up from the ground to go back to its rest position. For all these phases the vacuum motor will continue to operate, only after a few seconds that it has returned to its work position will it switch off, this is to allow the motor to collect all the liquid in the vacuum hose. During these phases, the symbol of the vacuum motor on the instrument panel display will blink, and it will only stop when the squeegee is in its rest position and the vacuum motor is off. If reverse is carried out with this program active, the squeegee will move to the rest position, the vacuum motor will keep working for a pre-set time and then it will switch off.



The drying without scrubbing operation should only be carried out if the machine was previously used to carry out a scrubbing without drying operation.



Scrubbing with Drying function:

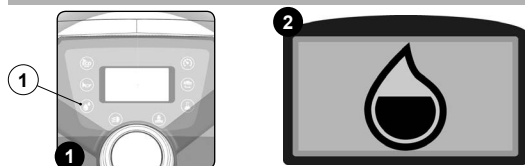
With the selector in the scrubbing with drying mode it is possible to both scrub and dry the floor at the same time. The main actuators active are those of the traction hub motor brush head gearmotors and vacuum motor. When the drive pedal is pressed, both the brush head and the squeegee will move to the working position, and as soon as it is in contact with the ground the brush head gearmotors and the vacuum motor start working in full working order. If the machine stops and the foot pedal is released during the operation, the brush head body will start to rise to return to the rest position, and after a period of time the gearmotors will switch off. The squeegee body will stay in contact with the floor for a few seconds, after which it will raise up from the ground and return to its rest position. For all these phases the vacuum motor will continue to operate, only after a few seconds that it has returned to its rest position will it switch off, this is to allow the motor to collect all the liquid in the vacuum hose. During these phases, the symbol of the vacuum motor on the instrument panel display will blink, and it will only stop when the squeegee is in its rest position and the vacuum motor is off. If reverse is carried out with this program active, the squeegee will move to the rest position, the vacuum motor will keep working for a pre-set time and then it will switch off.



Scrubbing without drying function:

With the selector in scrubbing without drying mode, it is possible to scrub the floor without vacuuming the detergent solution applied. The main actuators active are those of the traction hub motor and the brush head gearmotors. When the drive pedal is pressed, the brush head will move to the working position, and as soon as it is in contact with the ground the brush head gearmotors start working in full working order. If the machine stops and the foot pedal is released during the operation, the brush head body will start to rise to return to the rest position, and after a period of time the gearmotors will switch off.

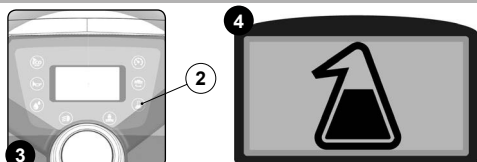
WATER FLOW ADJUSTMENT FUNCTION



The water flow function in the machine's water system is regulated by the button (1) on the control panel (Fig. 1). By pressing the button (1) for the first time, you can display in the control display the status of the water flow set in the machine at that precise moment (Fig. 2), each time the button (1) is pressed, the water level increases, and the flow rate will be zeroed once the maximum level is reached. The water flow rate changes by pressing the button again, there are 8 selectable levels (also counting the zero level). If the button (1) is kept pressed for more than three seconds, the water flow rate in the machine's water system is reset.

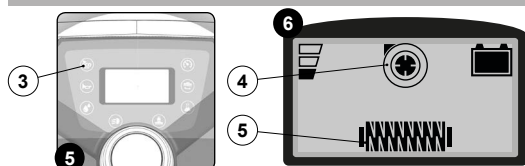
The water flow rate level refers to the flow delivered at maximum machine speed, at intermediate speeds, the flow is reduced and is proportional to the value set.

DETERGENT SOLUTION FLOW ADJUSTMENT FUNCTION (CDS VERSION)



The detergent solution flow function in the machine's water system is regulated by the button (1) on the control panel (Fig. 1). By pressing the button (1) for the first time, you can display in the control display the status of the detergent solution flow set in the machine at that precise moment (Fig. 2), each time the button (1) is pressed, the detergent percentage increases, and the flow will be zeroed once the maximum percentage is reached. The detergent solution percentage changes by pressing the button again, there are 8 selectable levels (also counting the zero level). If the button (1) is kept pressed for more than three seconds, the flow of detergent solution in the machine's water system is reset.

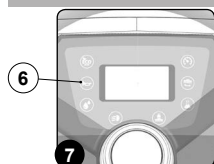
ECO-MODE FUNCTION



When the "ECO MODE" function is activated, by means of the appropriate key (3) on the control panel (Fig. 5), the speed of the brushes' gearmotor and of the vacuum motor is reduced, in this way the energy consumption is reduced.

The Eco-mode function can only be used with working programs: drying; scrubbing with drying and scrubbing without drying. When the eco-mode function is active the symbols of the vacuum motor (4) or the brush (5) or both, depending on the working program selected, will be shown on the control display as shown in the figure (Fig. 6).

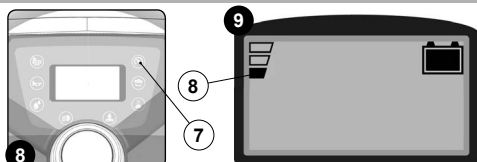
BUZZER



When button (6) on the control panel (Fig. 7) is pressed continuously it activates the buzzer on the machine.

If the button (6) is pressed during the reverse movement, as a signal priority, only the intermittent buzzer connected to the reverse will be heard.

MOVEMENT SPEED ADJUSTMENT

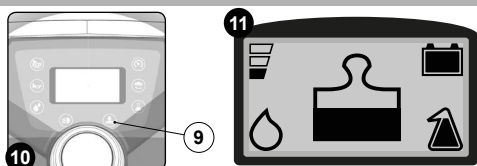


When the button (7) on the control panel (Fig. 8) is pressed it allows to adjust the speed of machine's movement, the level selected can be viewed by looking at the symbol (8) on the control display (Fig. 9).

Each time the button (7) is pressed, the speed level of the machine's movement is increased, once the maximum level has been reached, the speed will start again from the first level. Pressing the button subsequently changes the movement speed of the machine, there are 3 selectable levels (50% - 75% - 100%).

the reverse speed is lower than the forward speed to comply with current health and safety standards.

EXTRA-PRESSURE FUNCTION EXERTED ON THE BRUSHES

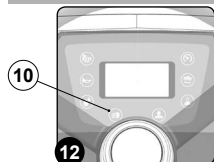


The extra-pressure function applied to the brushes is adjusted by means of the button (9) on the control panel (Fig. 10).

By pressing the button (9) for the first time, you can display in the control display the level of extra-pressure exerted on the brushes at that precise moment (Fig. 11), each time the button (9) is pressed, the extra-pressure level increases, and the extra-pressure will be zeroed once the maximum level is reached. The extra-pressure changes by pressing the button again, there are three selectable levels (also counting the zero level). If the button (9) is kept pressed for more than three seconds, the extra-pressure is reset.

The set level is displayed with the weight symbol above the brush symbol in the control display.

DIPPED HEADLIGHTS



The default machine has two sidelights at the front of the nose that are activated when the machine is turned on.

Pressing the button (10) on the control panel (Fig. 12) activates the machine's dipped beam headlights, pressing the button again, the headlights will switch off.

HOUR METER

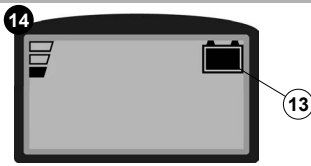


Through the control display, in the screen after switching on, it is possible to view the hours of work performed by the machine in the central part of the screen (Fig. 13).

The first line shows the total time the machine (11) has been used and the second line indicates the partial time of the use of the machine (12).

N.B.: The numbers followed by the letter "h" identify the hours, while the numbers followed by the letter "m" identify the tenths of an hour (a tenth of an hour corresponds to six minutes).

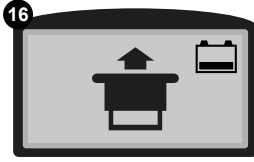
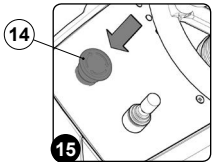
BATTERY CHARGE LEVEL INDICATOR



The machine's control panel contains the control display. At the top right of the work screen, there is a graphic symbol (13) representing the battery charge level indicator (Fig. 14). The indicator is composed of 5 charge levels, each of which represents about 20% of residual charge. With a residual charge of 20% the graphic symbol starts to flash and after a few seconds it will appear in larger dimensions in the middle of the screen, under these conditions take the machine to the usual place to charge the batteries.

- N.B.:** A few seconds after the battery charge level reaches 20%, the brush motors switch off automatically. With the remaining charge it is possible to complete the drying process before starting the recharge.
- N.B.:** A few seconds after the battery charge level reaches 10%, the vacuum motor switches off automatically. With the remaining charge, it is still possible, however, to move the machine to the location designated for its recharging.

EMERGENCY BUTTON



if there are any problems while you are working, press the emergency button (14) on the control panel (Fig. 15). This function interrupts all functions active at that moment, in this way both the brush head body and the squeegee body will rise from the floor and automatically switch off with the expected delays.

- N.B.:** As soon as the emergency button (14) is pressed, the dedicated symbol appears on the control display (Fig. 16).

Once you have stopped the machine and solved the problem, to resume work proceed as follows:

1. Turn the main machine switch to "0", turn the key a quarter turn anti-clockwise.
2. Move the emergency switch (14) to the resting position, turn the switch one forth of a turn to the right (as indicated by the arrows engraved in it).
3. Turn the main machine switch to "I", turn the key a quarter turn clockwise.

ALARM SCREEN



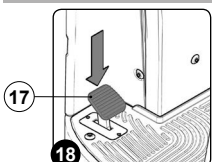
When an error occurs, the corresponding alarm screen (Fig. 17) will appear on the control display.

The display of the alarm consists of a first flashing line relating to the code (15) and the source of the error (16) (Fig. 17), while the second line displays a summary (18) of the error description.

ALARM #id	MEANING
AL_1: Function Amper. Brushes	Brushes overload protection
AL_2: Function Amper. Vacuum cleaner	Vacuum cleaner amperometric protection
AL_3: Function Power Board Damaged	Damaged power stage
AL_4: Function Overcurrent	Overcurrent on brush or vacuum cleaner outputs
AL_5: Function Overtemperature	Thermal cut-out protection on the brushes - vacuum cleaner stage
AL_8: Function Act1: time-out	Brushes actuator: final position not reached
AL_9: Function Act2: time-out	Squeegee actuator: final position not reached
AL_12: Traction Generic AL.	Undervoltage
	Overvoltage
	Key off
	EEPROM alarm
AL_13: Traction Pedal Faulty	Pedal jerking
AL_14: Traction Pedal Pressed	Pedal pressed at start-up

ALARM #id	MEANING
AL_15: Traction Overtemperature	Thermal cut-out protection on traction stage
AL_16: Traction Power Board Damaged	Traction power stage damaged
AL_17: Traction Overcurrent	Overcurrent on Traction output
AL_18: Traction Amperometric protection	Traction amperometric protection
AL_19: Traction PW stage relay	Traction - Fuse power stage damaged
AL_20: General Memory Error	Error reading internal memory
AL_21: General Issue with Key	Key sequence incorrect
AL_22: General Relay Faulty	General relay damaged
AL_23: General Overvoltage	Overvoltage
AL_25: General Connect. key	No dashboard-function communication
AL_26: General RX-TX Traction	No traction-function communication

SERVICE BRAKE



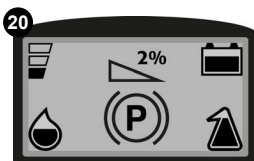
The machine is equipped with an electronic braking system (positioned in the front traction hub) and a mechanical drum brake system (positioned on the rear wheels).

To brake in normal conditions, just remove your foot from the accelerator pedal. In case of malfunction of the electronic braking system or if necessary, use the pedal (17) on the front left of the machine (Fig. 18).

ATTENTION: If when working, the symbol shown in (Fig. 19) appears in the control display, this means that the service brake is active for more than five seconds. With the machine fully stopped, check that the service brake pedal has returned to its rest position.

ATTENTION: If when working, the symbol shown in (Fig. 19) is flashing in the control display, this means that the brake fluid level is low.

CAUTION: If during the check when the machine is turned on there is a problem with the electro-brake, the acoustic signal will sound continuously for ten seconds during which the symbols will flash alternately on the control display shown in the image (Fig. 20). To solve the problem, contact an authorised technical assistance centre. With the alarm active, the machine can not work on surfaces with an inclination greater than 2%.



OVERFLOW DEVICE

The machine is equipped with a mechanical device (float) under the recovery tank lid that, when the recovery tank is full, shuts off the air to the vacuum motor intake to protect it; the sound of the vacuum motor will then be deeper. To empty the recovery tank (read ["EMPTYING THE RECOVERY TANK"](#)).

AT THE END OF THE WORK

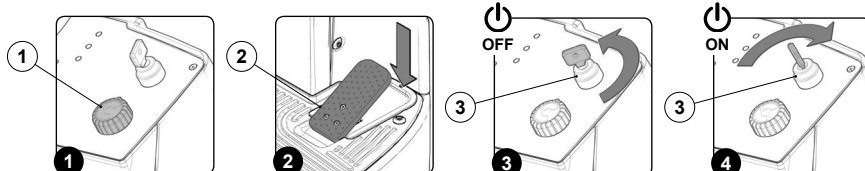
At the end of the work, and before carrying out any type of maintenance, perform the following operations:

1. Select the TRANSFER mode using the knob (1) (Fig. 1) on the control panel.
2. Press the drive pedal (2) (Fig. 2) to begin moving the machine.
3. Take the machine to the maintenance area.
4. Switch off the machine turning the key (3) of the main switch a quarter turn anti-clockwise (Fig. 3). Remove the key from the instrument panel.
5. Carry out all the procedures listed in the paragraph "ROUTINE MAINTENANCE" indicated in the column "AT THE END OF THE WORK".
6. Sit on the driver's seat.
7. Insert the key (3) into the main switch on the control panel. Set the main switch to "I" (Fig. 4).
8. Press the drive pedal (1) (Fig. 1) to begin moving the machine.
9. Take the machine to the designated machine storage place.



ATTENTION: Park the machine in an enclosed place, on a flat surface; near the machine there must be no objects that could either damage it, or be damaged through contact with it.

10. Secure the machine, see the section titled "SECURING THE MACHINE".



ROUTINE MAINTENANCE

TYPE OF MAINTENANCE	AT THE END OF THE WORK	DAILY	WEEKLY	BEFORE A LONG PERIOD OF NON-USE	TRANSPORT
DRAINING THE RECOVERY TANK	X			X	X
EMPTYING THE DEBRIS HOPPER	X			X	X
CLEANING THE SQUEEGEE BODY	X	X		X	
CLEANING THE RECOVERY TANK FILTER-FLOAT		X		X	
CLEANING THE BRUSH HEAD BRUSHES (SCRUBBING VERSION)		X		X	
CLEANING THE RECOVERY TANK		X		X	
EMPTYING THE SOLUTION TANK		X		X	X
CLEANING THE WATER SYSTEM FILTER		X		X	
CLEANING THE VACUUM TUBE		X		X	
CLEANING THE DETERGENT TANK (CDS VERSIONS)				X	

DRAINING THE RECOVERY TANK

Proceed as follows to empty the recovery tank:

1. Take the machine to the maintenance area.



N.B.: The place designated for this operation must comply with current environmental protection regulations.

2. Make sure the machine has been secured (see the section titled "SECURING THE MACHINE").



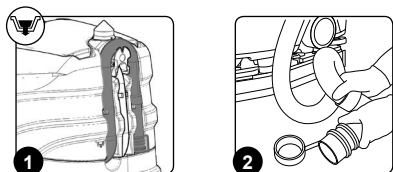
CAUTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. Remove the drainage hose of the recovery tank from the clamps; it is located at the rear of the machine (Fig. 1).
4. Bend the end of the drainage tube in order to create a choke and prevent the content from coming out (Fig. 2), then position the tube on the discharge surface, unscrew the cap, and gradually release the tube.



N.B.: The place designated for this operation must comply with current environmental protection regulations.

5. Repeat the operations in reverse order to reassemble all the parts.



EMPTYING THE DEBRIS HOPPER

To empty the debris hopper, proceed as follows:

1. Take the machine to the maintenance area.

(i) N.B.: The place designated for this operation must comply with current environmental protection regulations.

2. Make sure the machine has been secured (see the section titled "[SECURING THE MACHINE](#)").



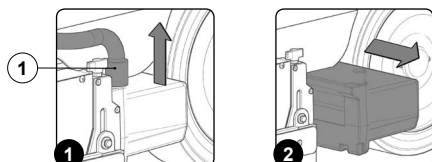
CAUTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. Standing to the left side of the machine disconnect the debris hopper vacuum tube (1) (**Fig. 1**).
4. Using the handle moulded into the debris hopper, slide it out of the brush head pre-assembly (**Fig. 2**).
5. Go to the place designated for emptying the debris hopper, and empty it. If necessary, use a spatula and a jet of water to remove the dirt inside the debris hopper.



N.B.: The place designated for this operation must comply with current environmental protection regulations.

6. Repeat the operations in reverse order to reassemble all the parts.



CLEANING THE SQUEEGEE BODY

The careful cleaning of the whole vacuum unit ensures better drying and cleaning of the floor as well as a longer vacuum motor life. To carry out the cleaning of the squeegee body, proceed as follows:

1. Take the machine to the designated maintenance place.

(i) N.B.: The place designated for this operation must comply with current environmental protection regulations.

2. Make sure the machine is in a safe condition (read "[MACHINE SAFETY](#)").



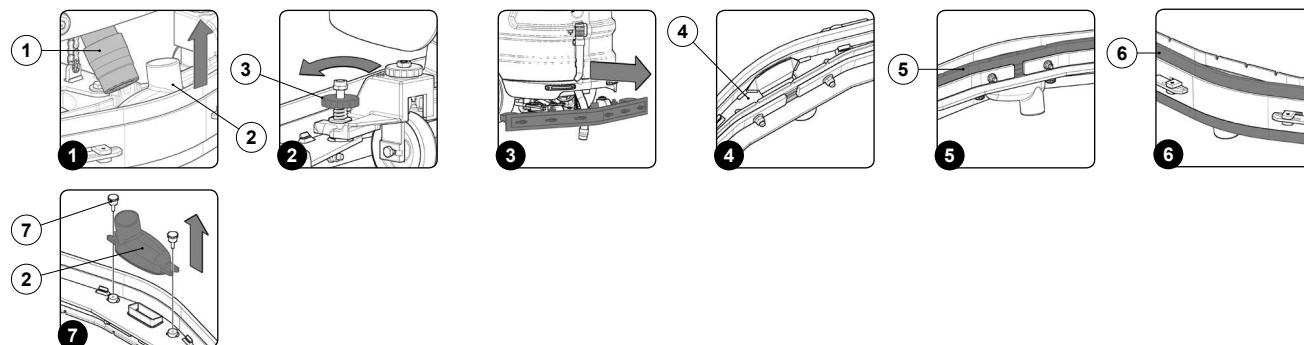
CAUTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. Stand at the back of the machine.
4. Remove the vacuum hose (1) from the sleeve in the vacuum nozzle (2) (**Fig. 1**).
5. Unscrew the knobs (3) in the squeegee body pre-assembly (**Fig. 2**).
6. Remove the squeegee body from the slits in the squeegee connector (**Fig. 3**).



N.B.: The place designated for this operation must comply with current environmental protection regulations.

7. First with a jet of water and then with a damp cloth, thoroughly clean the vacuum chamber (4) of the squeegee unit (**Fig. 4**).
8. First with a jet of water and then with a damp cloth, thoroughly clean the front rubber blade (5) of the squeegee unit (**Fig. 5**).
9. Check the wear of the front rubber blade (5) on the squeegee body; if the edge of the rubber in contact with the floor is worn, replace it. Refer to "[REPLACING THE SQUEEGEE UNIT RUBBER BLADES](#)".
10. First with a jet of water and then with a damp cloth, thoroughly clean the rear rubber blade (6) of the squeegee unit (**Fig. 6**).
11. Check the wear of the rear rubber blade (6) on the squeegee body; if the edge of the rubber in contact with the floor is worn proceed with replacement, reading the paragraph "[REPLACING THE SQUEEGEE UNIT RUBBER BLADES](#)" first, in any event it is possible to turn the rubber blade around four edges.
12. Unscrew the knobs (7) that fix the vacuum nozzle (2) to the squeegee unit (**Fig. 7**).
13. First with a jet of water and then with a damp cloth, thoroughly clean the vacuum nozzle (2). Also clean the squeegee body support surface.
14. Repeat the operations in reverse order to reassemble all the parts.



CLEANING THE RECOVERY TANK FILTER-FLOAT

Careful cleaning of the recovery tank filter-float guarantees better cleaning of the floor as well as a longer vacuum motor lifespan. Proceed as follows to clean the recovery tank filter-float:

1. Take the machine to the maintenance area.

(i) N.B.: The place designated for this operation must comply with current environmental protection regulations.

2. Make sure the machine has been secured (see the section titled "[SECURING THE MACHINE](#)").



CAUTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. Grip the handle (1) on the back of the recovery tank cover and remove it (**Fig. 1**).
4. Unscrew the floating cover (2) (**Fig. 2**).
5. Remove the vacuum filter (3) and clean it (**Fig. 3**).



N.B.: You are advised to use a jet of air to remove the impurities before cleaning the filter. Position the filter at least 20cm from the air jet.



ATTENTION: Do not use highly corrosive products to clean the filter, to avoid damaging it.

6. Unscrew the float's upper body (4) (**Fig. 4**).

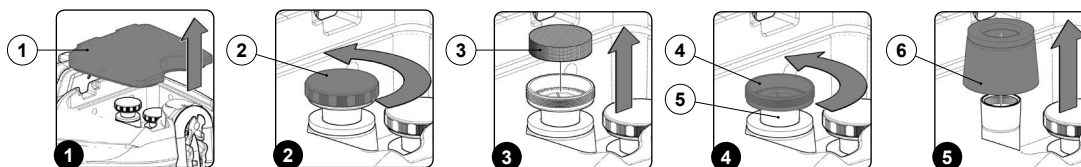


N.B.: When removing the upper part of the float, be very careful not to remove the lower (5) part as well (**Fig. 4**).

7. Remove the float (6) (**Fig. 5**). Rinse the inside with a jet of water. If necessary, use a spatula to remove the sludge that has accumulated at the bottom of the float.

i **N.B.:** If the polyurethane ring on the float body (Fig. 5) is excessively worn or damaged contact the nearest service centre.

8. Repeat the operations in reverse order to reassemble all the parts and move on the second float filter.



CLEANING THE BRUSH HEAD BODY BRUSHES

Careful cleaning of the brush guarantees better cleaning of the floor as well as a longer brush head gearmotor lifespan. To clean the brush, proceed as follows:

1. Take the machine to the maintenance area.

i **N.B.:** The place designated for this operation must comply with current environmental protection regulations.

2. Make sure the machine has been secured (see the section titled "SECURING THE MACHINE").

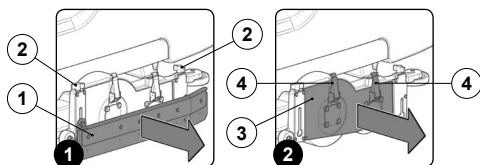
CAUTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. On the right side of the machine remove the right side splash guard (1) (Fig. 1), remember to fully unscrew the wing nuts (2) before removing the splash guards.
4. Remove the right side pre-assembly (3) from the brush head body (Fig. 2), lightly press downwards and then move it towards the outside of the machine, remember to release the hinges (4) before removing the right side.
5. Take out the brushes from the brush head and clean under a jet of water and if necessary remove any dirt in their bristles.

i **N.B.:** Check the bristles. If they are excessively worn, replace the brushes (the bristles should protrude by at least 10 mm).

6. Position the rear brush inside the brush head body, taking care to insert the brush correctly with the hub in the brush head body.
7. Position the front brush in the right side pre-assembly, taking care to correctly fit the hub in the right side pre-assembly with the brush

i **N.B.:** The two brushes have been correctly fitted when the respective cusp shapes, seen from above, form an X.



CLEANING THE RECOVERY TANK

To clean the recovery tank, proceed as follows:

1. Take the machine to the maintenance area.

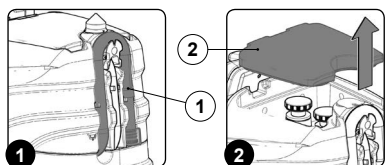
i **N.B.:** The place designated for this operation must comply with current environmental protection regulations.

2. Make sure the machine has been secured (see the section titled "SECURING THE MACHINE").

CAUTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. Release the recovery tank drainage tube (1), at the back of the machine (Fig. 1), from the retainers, unscrew the cap and place it on the ground.
4. Grip the handle (2) on the back of the recovery tank cover and remove it (Fig. 2).
5. Rinse the inside with a jet of water, if necessary use a spatula to remove the sludge that has accumulated at the bottom of the tank.
6. Repeat the operations in reverse order to reassemble all the parts.

Recycle **N.B.:** The place designated for this operation must comply with current environmental protection regulations.



EMPTYING THE SOLUTION TANK

Proceed as follows to empty the solution tank:

1. Take the machine to the maintenance area.

i **N.B.:** The place designated for this operation must comply with current environmental protection regulations.

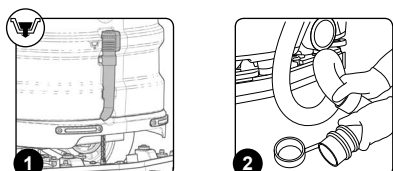
2. Make sure the machine has been secured (see the section titled "SECURING THE MACHINE").

CAUTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. Remove the drainage hose of the solution tank from the clamps; it is located at the rear of the machine (Fig. 1).
4. Bend the end of the drainage tube in order to create a choke and prevent the content from coming out (Fig. 2), then position the tube on the discharge surface, unscrew the cap, and gradually release the tube.

Recycle **N.B.:** The place designated for this operation must comply with current environmental protection regulations.

5. Repeat the operations in reverse order to reassemble all the parts.



CLEANING THE WATER SYSTEM FILTER

In order to clean the water system's filter, do the following:

1. Take the machine to the maintenance area.
2. Make sure the machine has been secured (see the section titled "[SECURING THE MACHINE](#)").



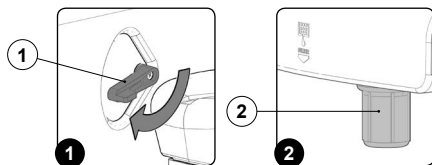
CAUTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. Tighten the outlet flow of the tap, turn the lever (1) on the back of the steering column anti-clockwise (**Fig. 1**).
4. Move to the front left-hand side of the machine and unscrew the detergent solution filter cap (2) (**Fig. 2**) and remove the cartridge in the filter body.
5. Rinse the filter cartridge under a jet of water, and use a brush to eliminate any impurities, if necessary.



N.B.: The place designated for this operation must comply with current environmental protection regulations.

6. Once the filter cartridge is clean, repeat the operations in the opposite order to reassemble all the parts.



CLEANING THE VACUUM TUBE

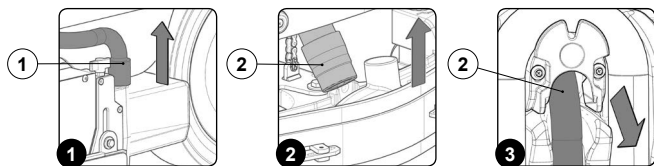
Careful cleaning of the vacuum hose guarantees better cleaning of the floor as well as a longer vacuum motor life. Proceed as follows to clean the vacuum hose:

1. Take the machine to the maintenance area.
2. Make sure the machine has been secured (see the section titled "[SECURING THE MACHINE](#)").



ATTENTION: Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.

3. Standing to the left side of the machine disconnect the debris hopper vacuum tube (1) (**Fig. 1**).
4. Extract the vacuum tube (2) from the vacuum nozzle on the squeegee body (**Fig. 2**).
5. Remove the vacuum tube (2) from the hole on the back of the recovery tank (**Fig. 3**).
6. The vacuum hose from the retainers present inside the recovery tank.
7. Rinse the inside of the vacuum hose with a jet of running water.
8. Repeat the operations in reverse order to reassemble all the parts.



CLEANING THE DETERGENT TANK (CDS VERSIONS)

The accurate cleaning of the detergent tank guarantees a better performance of the automatic chemical management system, guaranteeing constant efficiency in cleaning of the floor. To clean the canister, proceed as follows:

1. Bring the machine to the area designated for refilling the solution tank.
 2. Make sure the machine has been secured (see the section titled "[SECURING THE MACHINE](#)").
-  **N.B.:** The place designated for this operation must comply with current environmental protection regulations.
3. Unhook the tank rotation latch (1) (**Fig. 1**) and turn the recovery tank into the maintenance position (**Fig. 2**).
 4. Disconnect the male insert (2) from the female insert (3) present on the cap (4) for the detergent tank (5) (**Fig. 3**).



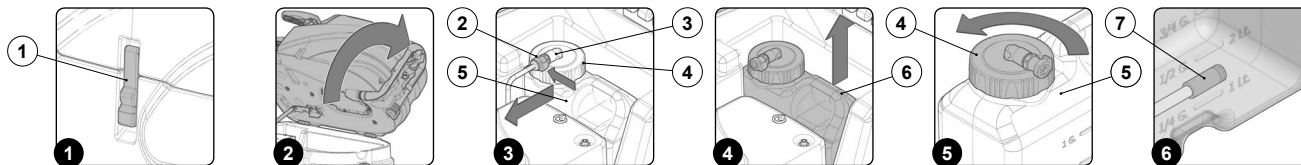
N.B.: Before pulling on the male insert, push the lever on the female insert.

5. Gripping the handle (6) on the detergent canister (5), remove the canister from the compartment in the solution tank (**Fig. 4**).
6. Remove the cap (4) from the detergent canister (5) (**Fig. 5**).
7. Rinse the inside of the canister with running water.



CAUTION: Protective gloves should always be worn before handling detergents or acidic or alkaline solutions, to avoid serious injury to the hands.

8. Make sure you tighten the cap (4) properly to avoid any leakage of liquid while working. Make sure the detergent suction filter (7) is correctly positioned on the bottom of the canister (**Fig. 6**).

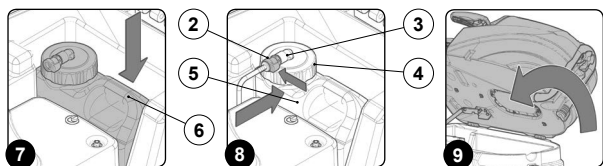


9. Gripping the canister handle (6), place the canister (5) back in its compartment inside the solution tank (**Fig. 7**).



ATTENTION: Position the detergent canister (8) as shown in figure (**Fig. 7**). To help, refer to the label located near the water system pumps support box.

10. Connect the male insert (2) to the female insert (3) in the cap (4) of the detergent canister (5) (**Fig. 8**).
11. Turn the recovery tank until it is closed in the working position (**Fig. 9**), tighten the tank rotation latch (1) in order to prevent accidental rotation.



EXTRAORDINARY MAINTENANCE WORK

REPLACING THE SQUEEGEE BODY RUBBER BLADES

The careful cleaning of the whole vacuum unit ensures better drying and cleaning of the floor as well as a longer vacuum motor life.
To carry out the cleaning of the squeegee body, proceed as follows:

1. Take the machine to the designated maintenance place.
-  **N.B.:** The place designated for this operation must comply with current environmental protection regulations.
2. Make sure the machine is in a safe condition (read "[MACHINE SAFETY](#)").
-  **CAUTION:** Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.
3. Stand at the back of the machine.
4. Remove the vacuum hose (1) from the sleeve in the vacuum nozzle (2) (**Fig. 1**).
5. Unscrew the knobs (3) in the squeegee body pre-assembly (**Fig. 2**).
6. Remove the squeegee body from the slits in the squeegee connector (**Fig. 3**).

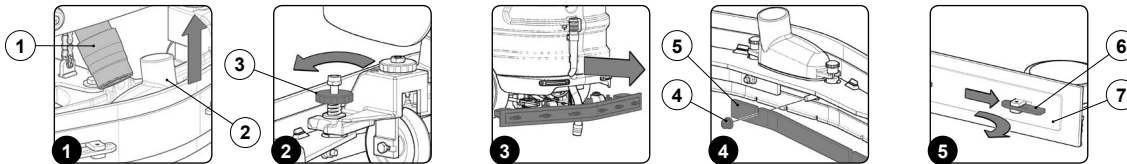
Proceed as follows for replacing the front rubber blade of the squeegee body:

7. Using the appropriate equipment (not present in the packaging of the machine), remove the nuts (4) that fix the rubber blades (5), then remove the rubber blades (**Fig. 4**).
8. Remove the worn front rubber blade and replace it with the new one.
9. Repeat the operations in reverse order to reassemble all the parts.

Proceed as follows for replacing the rear rubber blade of the squeegee body:

10. Using the appropriate equipment (not present in the packaging of the machine), turn the rubber blade retainer (6) that fix the rubber blades (7), then remove the rubber blades (**Fig. 5**).
11. Remove the worn rear rubber blade and replace it with the new one.
12. Repeat the operations in reverse order to reassemble all the parts.

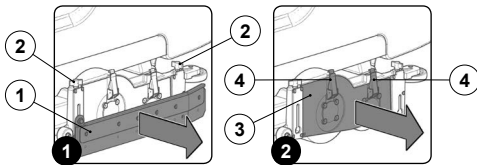
-  **N.B.:** Before returning to work, adjust the squeegee body, read paragraph "[SQUEEGEE BODY ADJUSTMENT](#)".



REPLACING THE BRUSH HEAD BODY BRUSHES

To replace the brush head brushes, proceed as follows:

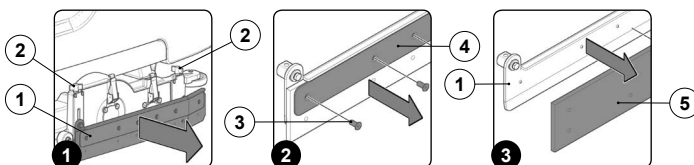
1. Take the machine to the maintenance area.
-  **N.B.:** The place designated for this operation must comply with current environmental protection regulations.
2. Make sure the machine has been secured (see the section titled "[SECURING THE MACHINE](#)").
-  **CAUTION:** Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.
3. On the right side of the machine remove the right side splash guard (1) (**Fig. 1**), remember to fully unscrew the wing nuts (2) before removing the splash guards.
4. Remove the right side pre-assembly (3) from the brush head body (**Fig. 2**), lightly press downwards and then move it towards the outside of the machine, remember to release the hinges (4) before removing the right side.
5. Take out the worn brushes from the brush head and replace them with new ones.
6. Repeat the operations in reverse order to reassemble all the parts.
-  **N.B.:** The two brushes have been correctly fitted when the respective cusp shapes, seen from above, form an X.



REPLACING THE BRUSH HEAD BODY SPLASH GUARD

To replace the brush head body splash guards, proceed as follows:

1. Take the machine to the maintenance area.
-  **N.B.:** The place designated for this operation must comply with current environmental protection regulations.
2. Make sure the machine has been secured (see the section titled "[SECURING THE MACHINE](#)").
-  **CAUTION:** Users are advised to always wear protective gloves, to avoid the risk of serious injury to hands.
3. On the right side of the machine remove the right side splash guard (1) (**Fig. 1**), remember to fully unscrew the wing nuts (2) before removing the splash guards.
4. With an appropriate tool remove the screws (3) and the side rubber blade retainer (4) from the right side splash guard (**Fig. 2**).
5. Remove the side rubber blade splash guard (5) (**Fig. 3**). Check the wear of the side rubber blade splash guard, if the edge of the rubber blade that is in contact with the floor is worn replace it and in any event it is possible to use it twice by turning it around the longitudinal axis of the rubber blade.
6. Repeat the operations in the reverse order to put everything back, then pass on to the left side splash guard.



ADJUSTMENT INTERVENTIONS

ADJUSTING THE SQUEEGEE BODY'S RUBBER BLADES

The careful adjustment of the squeegee body rubber blades guarantees better cleaning of the floor.
To adjust the squeegee body blades, proceed as follows:

1. Sit on the driver's seat.
2. Insert the key (1) into the main switch on the control panel. Set the main switch to "I" (Fig. 1).
3. Select the "SCRUBBING WITH DRYING" function using the knob (2) (Fig. 2).
4. Select the "FORWARD" movement direction using the selector switch (3) (Fig. 3).
5. Press the forward movement pedal (4) (Fig. 4) to begin moving the machine.
6. As soon as the brush head and the squeegee have reached their working positions, perform the procedure for securing the machine (see the section titled "[SECURING THE MACHINE](#)").

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

7. Stand at the back of the machine.

Adjusting the height of the squeegee body:

8. Adjust the height of the rubber blade in relation to the floor by loosening or tightening the knobs (5) (Fig. 5).

N.B.: The + and - symbols are printed on the squeegee support to indicate the rotation direction to increase or decrease the distance between the squeegee support and the floor.

N.B.: By decreasing the distance between the squeegee support and the floor, the rubber blades present in the squeegee's body move closer to the floor.

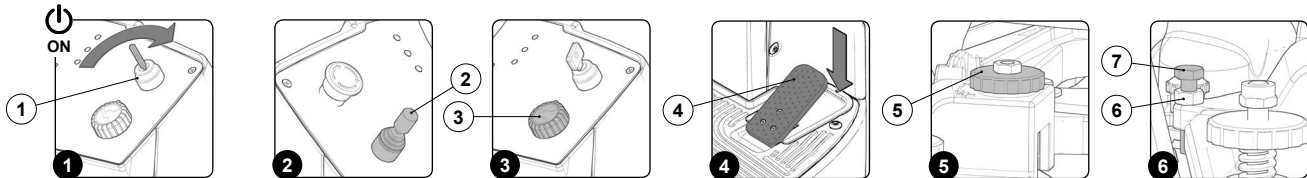
N.B.: The right-hand and left-hand knobs must be rotated the same number of times, so that the squeegee is parallel to the floor when it is working.

Adjusting the tilt of the squeegee body:

9. Loosen the stopper nut (6) of the squeegee's tilt adjustment screw (7) (Fig. 6).
10. To adjust the tilt of the squeegee body rubber blades in relation to the floor, tighten or loosen the screw (7) until the blades are bent outwards by about 30° in relation to the floor, in an even manner along their entire length.

N.B.: Turning the screw (7) clockwise will increase the tilt of the squeegee body towards the rear of the machine, turn in the opposite direction to rotate the squeegee towards the front of the machine.

11. Once adjustment is made, tighten the stopper nut (6) of the squeegee's tilt adjustment screw (7) (Fig. 6).



ADJUSTING THE SQUEEGEE BODY'S RUBBER BLADES

The careful adjustment of the squeegee body rubber blades guarantees better cleaning of the floor.
To adjust the squeegee body blades, proceed as follows:

1. Sit on the driver's seat.
2. Insert the key (1) into the main switch on the control panel. Set the main switch to "I" (Fig. 1).
3. Select the "SCRUBBING WITH DRYING" function using the knob (2) (Fig. 2).
4. Select the "FORWARD" movement direction using the selector switch (3) (Fig. 3).
5. Press the forward movement pedal (4) (Fig. 4) to begin moving the machine.
6. As soon as the brush head and the squeegee have reached their working positions, perform the procedure for securing the machine (see the section titled "[SECURING THE MACHINE](#)").

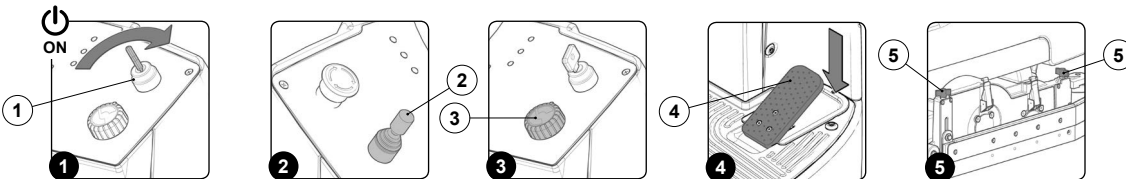
ATTENTION: These operations must be carried out using protective gloves to avoid any possible contact with the edges or tips of metal objects.

8. Stand on the right side of the machine.

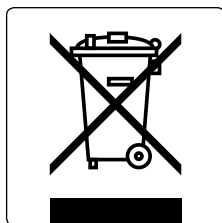
9. Turn the wing nuts (5) clockwise to move the side splash guard rubber blade away from the floor (Fig. 5), turn the wing nuts anti-clockwise to bring the side splash guard rubber blade closer to the floor.

N.B.: During working operation, the side splash guard rubber should be slightly and tilted outwards by about 30°- 45° with respect to the floor in a uniform way along its whole length.

10. Repeat the operations just described also for the left side splash guard.



DISPOSAL



To dispose of the machine, take it to a demolition centre or an authorised collection centre.
Before scrapping the machine, it is necessary to remove and separate out the following materials, then send them to the appropriate collection centres in accordance with the environmental hygiene regulations currently in force:

- Brushes
- Felt
- Electric and electronic parts*
- Batteries
- Plastic parts (tanks and handlebars)
- Metal parts (levers and frame)

(*) In particular, contact your distributor when scrapping electric and electronic parts.

EC DECLARATION OF CONFORMITY



The undersigned manufacturer:
COMAC S.p.A.
 Via Maestri del Lavoro, 13
 37059 Santa Maria di Zevio (VR)
 Declares under its sole responsibility that the products

FLOOR SCRUBBING MACHINES mod. OPTIMA 90BS

Comply with the requirements of the following Directives:

- 2006/42/EC: Machinery Directive.
- 2014/35/EC: Low Voltage Directive.
- 2014/30/EC: Electromagnetic compatibility directive.

The person authorized to compile the technical file:

Mr. Giancarlo Ruffo
 Via Maestri del Lavoro, 13
 37059 Santa Maria di Zevio (VR) - ITALY

Santa Maria di Zevio (VR), 11/07/2016

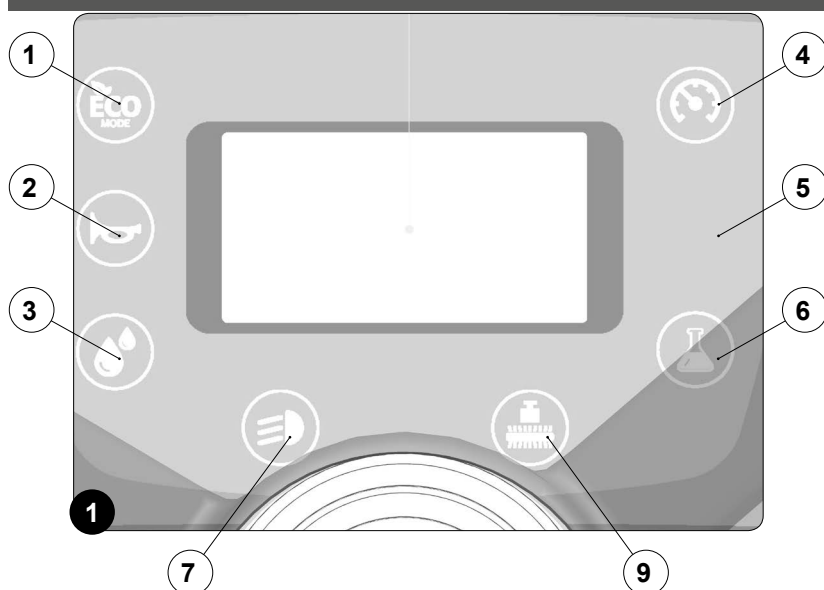
Comac S.p.A.
 Legal representative
 Giancarlo Ruffo

TROUBLESHOOTING

This chapter lists the most common problems linked with the use of the machine. If you are unable to resolve the problems with the information given here, please contact your nearest assistance centre.

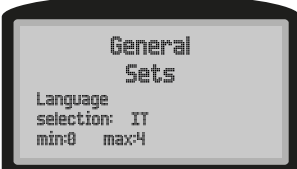
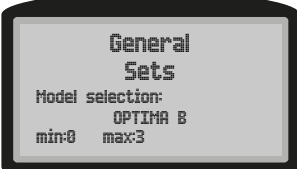
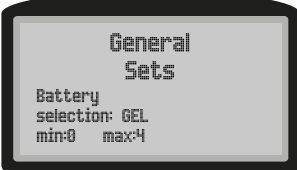
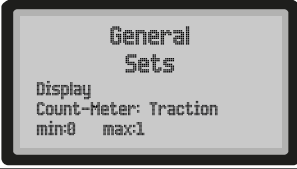
PROBLEM	POSSIBLE CAUSE	SOLUTION
THE MACHINE DOES NOT START	The main switch is set to "0".	Make sure that the main switch is set to "I".
	Check whether there are any alarm messages on the control display.	Stop the machine immediately, and contact a specialised service centre.
	Make sure that the batteries are correctly connected to each other and that the battery connector is connected to the electrical system connector.	Stop the machine immediately, and contact a specialised service centre.
	Check the charge level of the batteries.	If the battery charge level is critical, perform a complete recharge cycle (see paragraph " CHARGING THE BATTERIES ").
THE BATTERIES ARE NOT CHARGED CORRECTLY	The connector of the battery charger cable is not properly inserted in the battery connector.	Stop the machine immediately, and contact a specialised service centre.
	The plug on the battery charger's power cable is not correctly inserted into the electrical outlet.	Check that the battery charger power supply cable plug is connected to the mains socket.
	The characteristics of the mains power supply do not correspond to those required by the battery charger.	Check that the characteristics in the battery charger plate are the same as those of the mains supply.
	The LEDs of the battery charger blink repeatedly.	Referring to the battery charger use and maintenance manual, check the meaning of the flashing signals that the battery charger emits during the battery recharge stage.
THE MACHINE HAS A VERY LOW WORK AUTONOMY	Check the battery charge level, check the symbol on the command display.	If the battery charge level is critical, perform a complete recharge cycle (see paragraph " CHARGING THE BATTERIES ").
THE MACHINE DOES NOT MOVE	The machine does not start.	Read the section " THE MACHINE DOES NOT START ".
	There is an issue on the drive pedal.	Stop the machine immediately, and contact a specialised service centre.
INSUFFICIENT DETERGENT SOLUTION ON THE BRUSHES	The quantity of detergent solution in the water system is not sufficient for the work to be carried out.	Check that the amount of detergent solution present in the machine's water system is sufficient for the work to be carried out.
	Detergent solution filter obstructed.	Check the detergent solution filter isn't obstructed. If it is, clean it (see " CLEANING THE WATER SYSTEM FILTER ").
THE MACHINE DOES NOT CLEAN CORRECTLY	The machine does not start.	Read the section " THE MACHINE DOES NOT START ".
	Not enough detergent solution comes out.	Read the section " INSUFFICIENT DETERGENT SOLUTION ON THE BRUSHES ".
	The brushes have not been inserted correctly in the machine.	Check that the brushes have been correctly inserted in the machine (see paragraph " ASSEMBLING THE BRUSH HEAD BODY BRUSHES ").
	The type of brush used is not suitable for the dirt to be cleaned.	Check that the brushes on the machine are adequate for the work to be carried out.
	The brush bristles are excessively worn.	Check the condition of the brush, and replace it if necessary (see " ASSEMBLING THE BRUSH HEAD BODY BRUSHES ").
THE SQUEEGEE DOES NOT DRY PERFECTLY	The vacuum unit is obstructed.	Make sure the squeegee is free of obstructions (read " CLEANING THE SQUEEGEE BODY ").
		Make sure the squeegee is free of obstructions (read " CLEANING THE SQUEEGEE BODY " and " CLEANING THE VACUUM TUBE ").
		Make sure that the recovery tank filter-float is free of any obstructions (see the section " CLEANING THE RECOVERY TANK'S FILTER-FLOAT ").
	The cap on the recovery tank drainage tube is not properly positioned.	Check that the cap on the recovery tank drainage tube is positioned properly.
	The recovery tank lid is not positioned correctly.	Check that the recovery tank lid is properly positioned on the machine.
EXCESSIVE FOAM PRODUCTION	The detergent being used is not suitable.	Check that a low foam detergent has been used. If necessary, add a small quantity of antifoam liquid to the recovery tank.
	The floor is not very dirty.	Dilute the detergent more.
THE MACHINE DOES NOT VACUUM CORRECTLY	The recovery tank is full.	Empty the recovery tank (read the section " EMPTYING THE RECOVERY TANK ").
	The vacuum device is obstructed	Read the section " THE SQUEEGEE DOES NOT DRY PERFECTLY ".

BROWSING THE COMMAND DISPLAY MENU



To access the programming pages it is necessary to turn on the machine keeping buttons (4) and (6) pressed (**Fig. 1**).
The first general menu item will appear after the first screens.
The active keys within the programming procedures are:

1. Scroll: access to the next parameter.
2. Confirm parameter value.
3. Scroll: Access to the previous parameter.
4. Point value increase.
5. Not used.
6. Point value decrease.
7. Not used.
8. Not used.
9. Not used.

MENU	DEFAULT	SETTABLE VALUES	DESCRIPTION
	EN	IT – EN – DE – FR - SP	Allows to select the language of the control display.
	OPTIMA	OPTIMA B – B DS – BS – BS DS	allows to select the name of the machine that will appear written in the second start-up screen, with all the parameters dedicated to it.
	WET	WET – GEL – XFC	Allows to select which type of batteries are being used to power the machine.
	N	NO RESET - RESET	Allows to reset the partial hour meter displayed in the thirist screen after the machine has been started.
	ON	ON/OFF	Allows to choose whether to have the sidelights on when the machine is operating.
	Tr	Tr - Key	Allows to choose whether the hour meter starts counting when the machine is turned on (key) or when the traction motor is started (Tr).

MENU	DEFAULT	SETTABLE VALUES	DESCRIPTION
	15	5 - 50	Allows to adjust the control display contrast.
	10	0 - 10	Allows to adjust the control display brightness.
	N	Y/N	Allows to exit the operator menu.



COMAC S.p.A. Via Maestri del Lavoro, 13 - 37059 Santa Maria di Zevio - Verona - ITALY
Tel. 045 8774222 - Fax 045 8750303 - www.comac.it - com@comac.it

Organisation certified by Q.C.B. Italia ISO 9001:2008, ISO 14001:2015, OHSAS 18001:2007