

# USE AND MAINTENANCE MANUAL



L20 B-E

ED. 09-2011

EN

ORIGINAL  
INSTRUCTIONS  
Doc. 10031148  
AA Version



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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.

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

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### Symbols used in the manual

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Open book symbol with an "i"  
Indicates the need to consult the instruction manual

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Open book symbol  
Used to tell the operator to read the manual before using the machine

---



Warning symbol  
Carefully read the sections marked with this symbol and observe the indications, for the safety of the operator and the machine

---



Warning symbol  
Indicates danger of gas exhalation and leakage of corrosive liquids

---



Warning symbol  
Indicates the danger of fire  
Do not go near with free flames

---



Warning symbol  
Indicates that the packed product should be handled with suitable lifting means that comply with the legal requirements

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Disposal symbol  
Carefully read the sections marked with this symbol, for machine disposal

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## 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

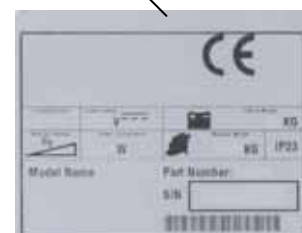
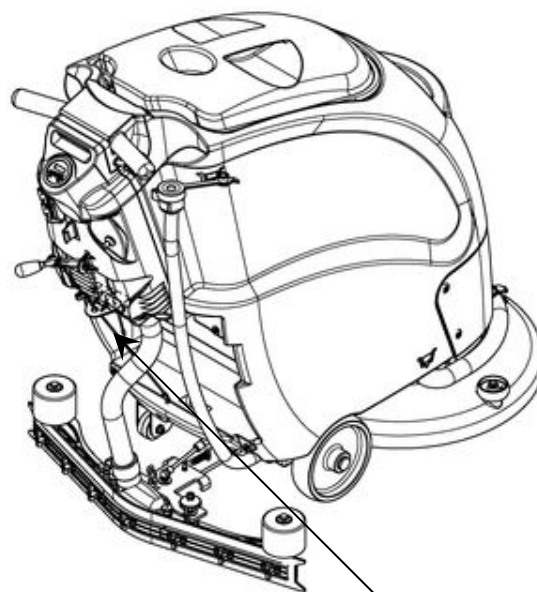
L20 is a scrubbing machine that is able to clean a wide variety of flooring and dirt types by using the mechanical action of at least one disk or cylindrical brushes (depending on the model), and the chemical action of a water-detergent solution. As it advances, it also collects the dirt removed and the detergent solution not absorbed by the floor.

**The machine must be only used for this purpose.** Even the best machines will only work well if used correctly and kept in good working order. We therefore suggest you read this instruction booklet carefully and read it again whenever difficulties arise while operating the machine. If necessary, remember that our customer assistance service (organised in collaboration with our dealers) is always available for advice or direct intervention.

## Intended use

The scrubbing machine is exclusively designed for the professional cleaning of surfaces and floors in industrial, commercial and public environments. The machine is only suitable for use in closed (or at least covered) places. 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 within places with a potentially explosive atmosphere. In addition, it is not suitable as a means of transport for people or objects.

## Serial number plate



TECHNICAL DESCRIPTION	UM	L20 B	L20 E 230V	L20 E 110V
Working width	mm	508	508	508
Squeegee width	mm	680	680	680
Work capacity, up to	m <sup>2</sup> /h	1450	1450	1450
Disk brush	No. / Ømm	508 (1)	508 (1)	508 (1)
Brush rotations	rpm	135	135	165
Brush motor	V / W	24 / 560	230 / 750	110 / 750
Pressure on the brushes	kg	27.5	27.5	27.5
Maximum gradient with full load	%	2	2	2
Type of advance		Semi-aut.	Semi-aut.	Semi-aut.
Suction motor	V / W	24 / 310	230 / 450	110 / 450
Suction vacuum	mbar	104.5	104.5	104.5
Rear elastic wheels	Ø mm	175x45	175x45	175x45
Solution tank	l	36	36	36
Recovery tank	l	37	37	37
Machine length	mm	1165	1165	1165
Machine height	mm	995	995	995
Machine width (without squeegee)	mm	541	541	541
Battery compartment (l x l x h)	mm	330x345x270	-	-
Rated voltage	V	24	230	110
Batteries	V/Ah	12 / 77 (2)	-	-
Built-in battery charger	V/A	24 / 11		
Battery weight (max)	kg	54	-	-
Machine weight (empty and without batteries)	kg	61.5	61.5	61.5
Gross weight of the machine ready for use	kg	152	98	98
Noise level (ISO 11201)	dB (A)	-	68.8 ± 1.4	-
Hand vibration level (ISO 5349-1)	m/s <sup>2</sup>	-	2 ± 3.5%	-
Body vibration level	m/s <sup>2</sup>	-	-	-



## SYMBOLS USED ON THE MACHINE



Main switch symbol  
Used on the instrument panel, to indicate the switch for machine operation ON or OFF



Symbol denoting suction motor  
Used on the instrument panel to indicate the switch that commands suction motor operation



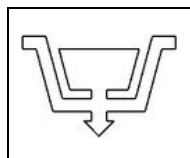
Brush release symbol  
Used on the instrument panel to indicate the button for automatic brush release



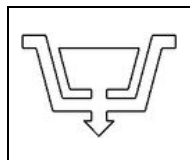
Squeegee UP symbol  
Used on the rear of the machine to indicate the position for the squeegee lifting cable



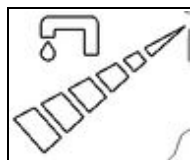
Squeegee DOWN symbol  
Used on the rear of the machine to indicate the position for the squeegee lifting cable



Symbol denoting solution tank emptying  
Used on the rear of the solution tank to indicate the position for the clean water drainage tube



Symbol denoting recovery tank emptying  
Used on the front right of the solution tank to indicate the position for the dirty water drainage tube



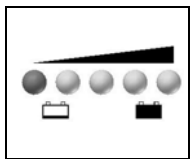
Water quantity adjustment symbol  
Used on the rear of the solution tank to indicate the knob for adjusting the quantity of water distributed on the brush



Indicates the maximum temperature of the detergent solution  
Located near the solution tank inlet



## SYMBOLS USED ON THE MACHINE



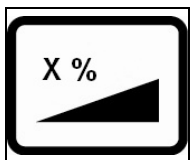
Battery charge level indicator



Warning - high voltage 110-230 Volt



Indicates the earth connection point of the electric system of the machine



Indicates the maximum gradient



## GENERAL SAFETY REGULATIONS

The regulations below must be carefully followed in order to avoid harm to the operator and damage to the machine.

### WARNING:

- 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 be exclusively used by authorised, trained personnel.
- The machine is designed for dry use only.
- Do not use the machine on surfaces with an inclination greater than the one shown on the plate.
- The machine is not suitable for cleaning rough or uneven floors. Do not use the machine on slopes.
- Avoid damaging the power supply cable by crushing or bending it, or applying stress.
- If the power supply cable of the battery charger is damaged, contact an Authorised service centre immediately.
- Do not let the power cable come into contact with the rotating brush.
- In the event of danger, quickly intervene on the handle located on the battery connector.
- For all maintenance interventions, switch off the machine and disconnect the battery connector and/or the power supply cable.
- Children must be supervised to ensure they do not play with the device.
- During the working of the machine, pay attention to other people and especially to children.
- Only use the brushes supplied with the machine, or those specified in the "CHOOSING AND USING THE BRUSHES" paragraph of the instruction manual. The use of other brushes could compromise safety levels.

### ATTENTION:

- The machine is not suitable for use by children and persons with reduced physical, mental and sensory capabilities, or people who lack experience and knowledge.
- The machine must not be used or stored outdoors, in damp conditions or directly exposed to rain.
- The storage temperature must be between -25°C and +55°C; do not store outdoors in damp conditions.
- Conditions of use: room temperature between 0°C and 40°C with relative humidity between 30 and 95%
- The socket for the machine's power cable (electric version) or for the battery charger power cable (battery version) must be correctly earthed.
- Adapt the speed to the adhesion conditions.
- Do not use the machine as a means of transport.
- The machine does not cause harmful vibrations.
- Do not use the machine in an explosive atmosphere.
- Do not vacuum inflammable liquids.
- Do not use the device to collect dangerous powders.
- Do not mix different types of detergent as this may produce harmful gases.
- The machine is not suitable for cleaning carpets.
- Do not place any liquid containers on the machine.
- 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 extinguisher. Do not use water.
- Do not knock against shelving or scaffolding, where there is a danger of falling objects. The operator must always be equipped with the appropriate safety devices (gloves, shoes, helmet, goggles, etc.).
- The machine is designed to simultaneously carry out the washing and drying operations. Different operations should only be carried out in areas where the passage of unauthorised persons is prohibited. Signal the presence of damp floors with suitable signs.
- 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.
- If you need to replace any components, request the ORIGINAL spare parts from an Authorised dealer and/or Retailer.
- Restore all electrical connections after any maintenance interventions.
- Before using the machine, check that all the hatches and covers are positioned as shown in this Use and Maintenance Manual.
- Do not remove any protection devices which require the use of tools in order to be removed.
- Do not wash the machine with direct water jets or with pressurised water, nor with corrosive substances.
- To prevent scaling in the solution tank filter, do not fill the tank with detergent solution many hours before using the machine.
- Do not use acid or basic solutions that could damage the machine and/or harm people.
- Have the machine checked by an authorised technical assistance centre every year.
- When disposing of consumption materials, comply with currently effective laws and regulations.
- When your machine has reached the end of its long working life, dispose of the materials it contains (especially oils, batteries and electronic components) in an appropriate manner, taking into account that the machine itself was constructed using 100% recyclable materials.
- The batteries must be removed from the machine before its disposal. The batteries must be disposed of in a safe manner, fully observing the laws and regulations in force.





## MACHINE PREPARATION

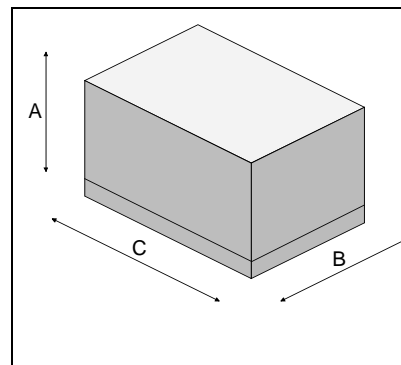
### 1. HANDLING THE PACKAGED MACHINE

The machine is contained in specific packaging with a pallet for the handling with fork trucks. The packages cannot be placed on top of each other.

The total mass of the machine with packaging is 76.5 kg (without batteries).

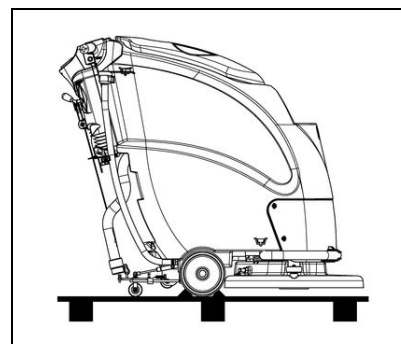
The dimensions of the packaging is as follows:

L20
A: 1145 mm
B : 665 mm
C: 1230 mm



### 2. HOW TO UNPACK THE MACHINE

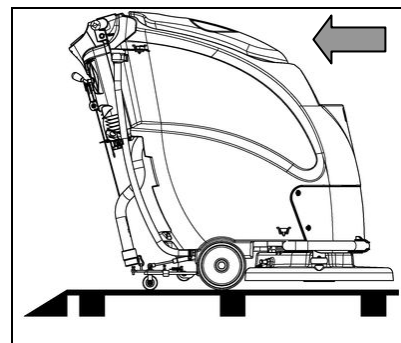
1. Remove the outer packaging.
2. The machine is fixed to the pallet with wedges which block the wheels.
3. Remove the wedges.



4. Use a chute to get the machine down from the pallet, pushing it backwards. Do not assemble the rear squeegee before unloading the machine, and avoid violently jolting the brush head. To assemble the squeegee, read the "ASSEMBLING THE SQUEEGEE" paragraph.
5. Keep the pallet for any future transport needs.

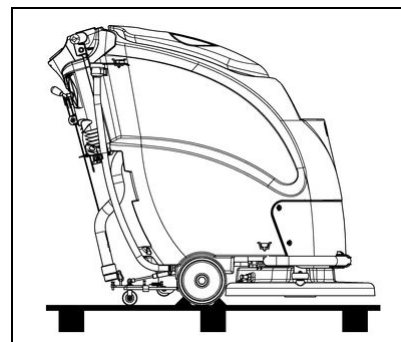


**WARNING:** if the product is delivered in cardboard containers, handle the packed product with suitable lifting means that comply with the legal requirements.



### 3. HOW TO MOVE THE MACHINE

1. Make sure the solution tank and the dirty water compartment are empty
2. Make sure the squeegee is UP
3. Remove the brush from the brush head
4. Place it on a pallet, using a chute
5. Make sure the main switch is in the OFF position
6. Secure the machine to the pallet using wooden wedges



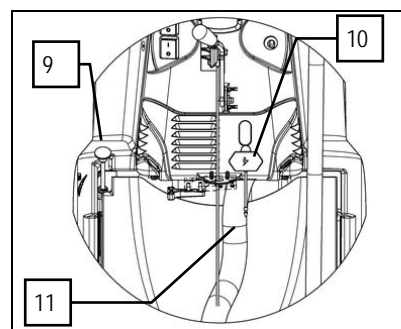
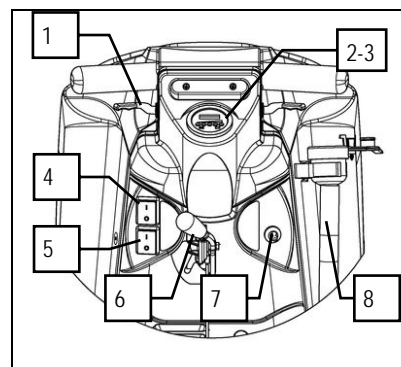


## MACHINE PREPARATION

### 4. MACHINE'S REAR COMPONENTS

The components at the rear of the machine are identified as follows:

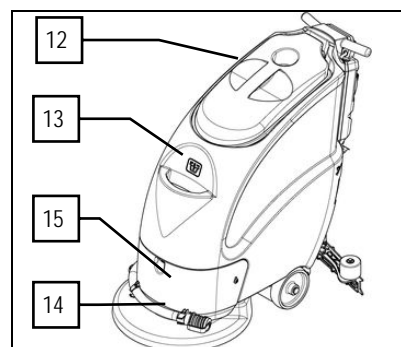
1. Brush operation / dead man's levers (located beneath the grip)
2. Display for battery level / hour meter (battery-operated versions)
3. Digital hour meter (electric versions)
4. Main machine switch
5. Suction motor switch
6. Control lever for commanding the squeegee lifting cable
7. 2-way switch for quick brush release (battery-operated versions), or thermal trip unit (electric versions)
8. Clean water drainage/filling tube
9. Tie-rod for adjusting the detergent solution flow
10. Protective cap for battery charger socket (BC versions)
11. Squeegee suction tube



### 5. FRONT MACHINE COMPONENTS

The components at the front of the machine are identified as follows:

12. Dirty water recovery compartment cover
13. Detergent solution inlet
14. Dirty water drainage tube
15. Casing for accessing the filter/solenoid valve (optional), and the motors



### 6. BATTERY TYPE (B VERSION)

To power the machine it is necessary to use:

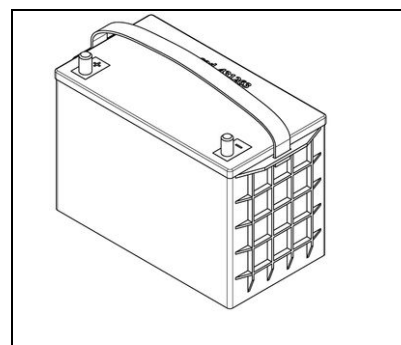
- liquidelectrolyte lead traction batteries;
- sealed traction batteries with gasrecombination or gel technology.

OTHER TYPES MUST NOT BE USED.

The batteries must meet the requirements laid out in the norms: CEI EN 60254-1:2005-12 (CEI 21-5) + CEI EN 60254-2:2008-06 (CEI 21-7).

The battery compartment can house two 12V batteries.

For good working operation, you are advised to use two 12V MFP 77AH GEL batteries; for the other models, check whether these are suitable for the battery compartment dimensions.



### 7. MAINTENANCE AND DISPOSAL OF THE BATTERY (B VERSION)

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

Particular attention must be paid when choosing the battery charger, if not supplied, since there are different kinds according to the type and capacity of the battery.

When the battery reaches the end of its working life, it must be disconnected by expert, trained personnel, then lifted (using the grips and suitable lifting devices) to remove it from the battery compartment. DEAD BATTERIES ARE CLASSIFIED AS DANGEROUS WASTE AND MUST BE DELIVERED TO THE AUTHORISED BODIES FOR CORRECT DISPOSAL.



## MACHINE PREPARATION



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



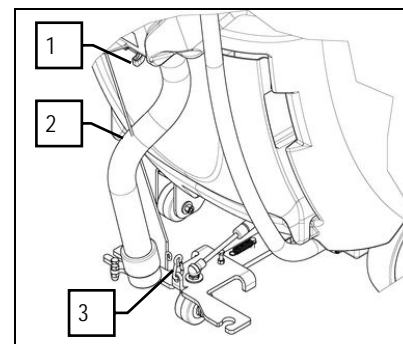
**WARNING:** You are advised to only lift and move the batteries with lifting and transportation means suitable for the specific weight and size

### 8. FITTING THE BATTERIES INTO THE MACHINE (B VERSION)

The batteries must be housed in the special compartment in the rear part of the machine. They should be handled using lifting equipment that is suitable in terms of both weight and hook-up system. They must also meet the Standard CEI 21-5 requirements. The dimensions of the battery compartment are: 330 x 345 x H270mm.

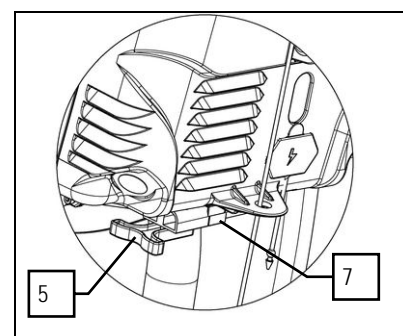
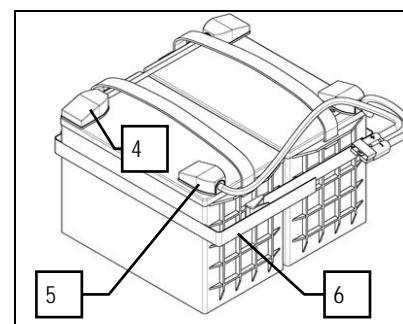


**WARNING:** For battery maintenance and daily recharging, you must fully respect the indications provided by the manufacturer or retailer. All installation and maintenance operations must be carried out by specialised personnel.



To insert the batteries you must:

1. Detach the suction tube (2) from the nozzle on the squeegee
  2. Remove the hook (3) that fixes the squeegee lifting cable to the squeegee support
  3. Move the squeegee support to the right
  4. Remove the rear casing that covers the batteries (1)
  5. Position the poles "+" and "-" opposite to each other
  6. connect the batteries in series - using the supplied jumper cable (4) - to the poles "+" and "-"
  7. Using a support surface, position the batteries in the relevant compartment
- 
8. Connect the battery connector cable (5) to the terminal poles "+" and "-" to obtain a voltage of 24V on the clamps
  9. Fix the batteries with the aid of the belt (6)
  10. Connect the battery connector cable (5) to the machine connector cable (7)
  11. Insert the rear casing that covers the batteries (1)
  12. Fix the squeegee lifting hook (3) to the squeegee support
  13. Fix the suction tube (2) to the nozzle on the squeegee



**WARNING:** you are advised to use airtight batteries only, to avoid the leakage of acids!



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



## MACHINE PREPARATION



**WARNING:** You are advised to only lift and move the batteries with lifting and transportation means suitable for the specific weight and size



**WARNING:** you are advised to have the electric connections made by a qualified, COMAC trained technician

### 9. BATTERY CHARGER CONNECTION (B VERSION, WITHOUT BC)

In order not to cause permanent damage to the batteries it is essential to avoid their complete discharge: arrange the recharge within a few minutes of the switching on of the flashing "discharged batteries" signal.



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

To connect the batteries you must:

1. Make sure the dirty water recovery tank is empty; if necessary, empty it completely
2. Make sure the switch is in the OFF position
3. Take the machine to the designated machine storage place (where the battery charger is located)

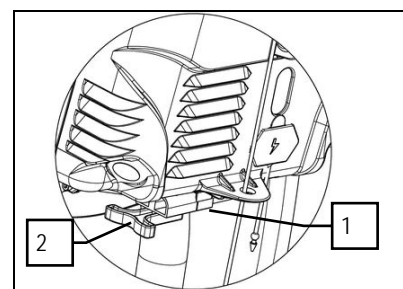


**WARNING:** park the machine indoors, on a flat and level surface; near the machine there must be no objects that could either damage it, or be damaged through contact with it

4. Disconnect the battery connector (2) of the machine connector (1).
5. Connect the battery charger connector to the battery connector (2).
6. After fully recharging the batteries, disconnect the battery charger connector from the battery connector (2).
7. Connect the battery connector (2) to the machine connector (1).



**WARNING:** Carefully read the use and maintenance instructions of the battery charger that is used for charging.



### 10. BATTERY CHARGER CONNECTION (B VERSION, WITH BC)

In order not to cause permanent damage to the batteries it is essential to avoid their complete discharge: arrange the recharge within a few minutes of the switching on of the flashing "discharged batteries" signal.



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



## MACHINE PREPARATION

To connect the batteries you must:

1. Make sure the dirty water recovery tank is empty; if necessary, empty it completely
2. Make sure the switch is in the OFF position
3. Take the machine to the designated machine storage place

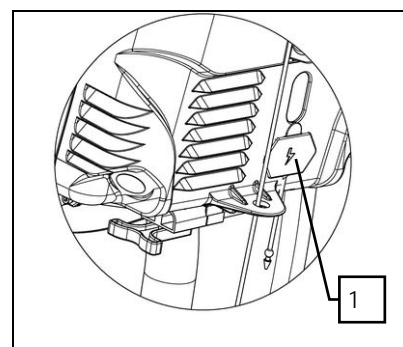


**WARNING:** park the machine indoors, on a flat and level surface; near the machine there must be no objects that could either damage it, or be damaged through contact with it

4. Remove the protective cap from the battery charger connector socket on the back of the machine (1)
5. Plug the battery charger cable (supplied with the machine) into the freed socket
6. Plug the battery charger cable into the mains socket
7. Follow the instructions in the enclosed booklet for the correct use of the battery charger, located inside the casing that covers the electrical system



**WARNING:** If one of the three LEDs flashes refer to the battery charger manual supplied with the machine



**WARNING:** The machine is equipped with an automatic system that disconnects the power supply from the electrical system while the batteries are being recharged

**WARNING:** In order not to cause permanent damage to the batteries, it is essential to avoid their complete discharge: arrange the recharge within a few minutes of the switching on of the flashing "discharged batteries" signal

**WARNING:** Never leave the batteries completely discharged, even if the machine is not being used

**WARNING:** For the daily recharging of the batteries, you must fully respect the indications provided by the manufacturer or retailer. All installation and maintenance operations must be carried out by specialised personnel.

**WARNING:** Carefully read the use and maintenance manual of the charger that is delivered inside the bag containing this instruction booklet.

**WARNING:** Before inserting the charger power cable into the socket, verify that there is no condensate or other forms of liquids.



**WARNING:** danger of gas fumes and the leakage of corrosive liquids



**WARNING:** danger of fire: do not go near with free flames.



## MACHINE PREPARATION

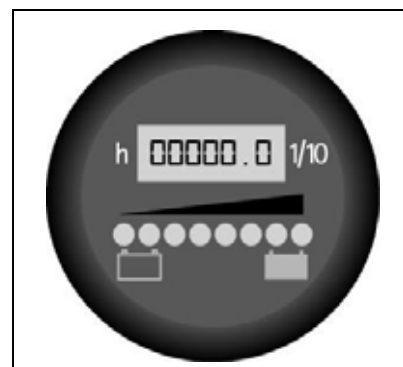
### 11. BATTERY CHARGE LEVEL INDICATOR (B VERSION)

On the upper part of the display, you will see the total operating time. The line visualised shows the operating hours; the number consists of five figures, plus one figure after the point "." to show the tenth of an hour.

The battery indicator uses LEDs and has 8 positions (7 yellow - charged batteries, and 1 red - run down batteries).

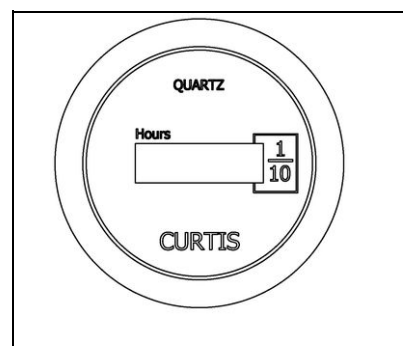


**WARNING:** A few seconds after the red indicator light comes on, the brush motor switches off automatically. With the remaining charge it is possible to complete the drying process before recharging



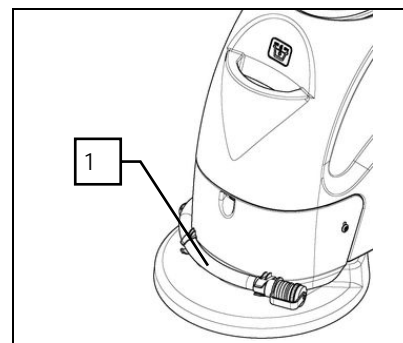
### 12. DIGITAL HOUR METER (E VERSION)

On the upper part of the display, you will see the total operating time. The line visualised shows the operating hours; the number consists of five figures, plus one figure after the point "." to show the tenth of an hour.



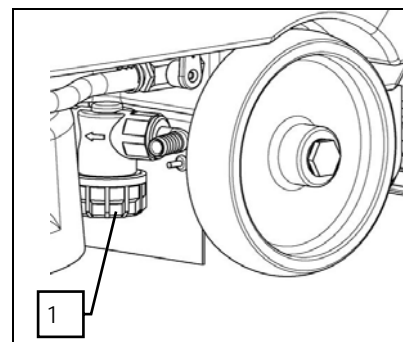
### 13. RECOVERY TANK

Make sure the dirty water recovery tank is empty; if necessary, empty it completely.  
Check the drainage tube cap (1) - in the front part of the machine - is correctly closed and fitted.

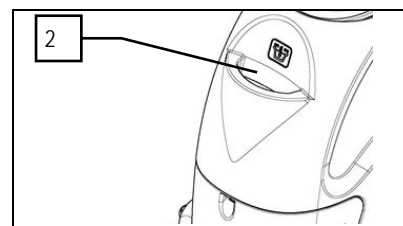


### 14. SOLUTION TANK

The dirty water recovery tank must be completely emptied each time the solution tank is filled. Check the solution filter cap (1) - included in the optional solenoid valve kit - behind the brush head, is correctly closed.



Check the solution filter (2) in the filling nozzle - in the front part of the machine - is correctly positioned.



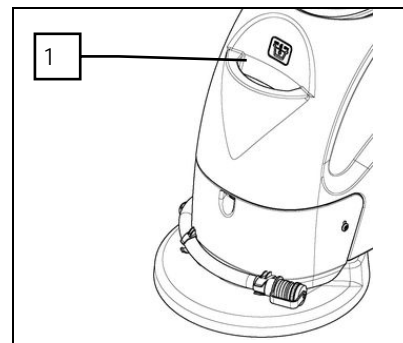


## MACHINE PREPARATION

### 15. FILLING THE SOLUTION TANK

The solution tank can be filled in two different ways:

1. with a rubber tube, or buckets of water, using the filling nozzle (1) on the front part of the solution tank

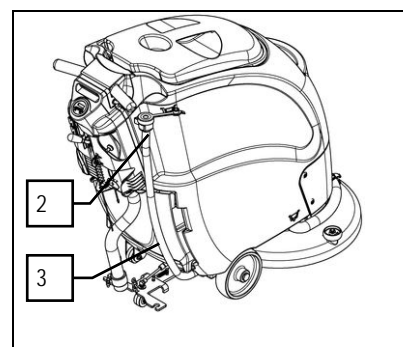


2. with a rubber tube, using the rubber cap (2) on the rear part of the solution tank



**WARNING:** make sure you keep the cap higher than the front filling nozzle

By means of the transparent tube (3) and the level notches on the rear part of the solution tank, you can see how much water is in the tank.



### 16. DETERGENT SOLUTION

Fill with clean water, at a temperature no higher than 50°C. The solution tank has a maximum capacity of about 35 litres. Add the liquid detergent to the tank in the concentration and manner indicated on the detergent manufacturer's label. The formation of excess foam could damage the suction motor, so use only the minimum amount of detergent that is necessary.



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



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



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



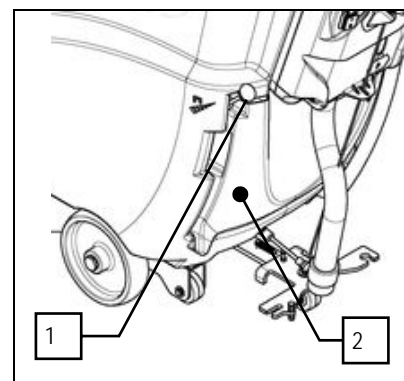
## MACHINE PREPARATION

### 17. REGULATING THE DETERGENT

To regulate the flow of detergent solution, push the tap rod lever (1) on the rear left side of the solution tank (push the lever to increase the flow of solution onto the brush); when you press the dead man's levers, the brush is enabled and the machine begins to move. During the first few meters check that the amount of solution is sufficient to wet the floor, but not excessive to exit the splash guard. Bear in mind that the correct amount of solution is always depends on the nature of the floor, the degree of dirt and the forward speed.



**WARNING:** Make sure the solution tap is turned off by pulling the tap rod lever (1) after using the machine; otherwise, the detergent solution will continue coming out (versions without the optional solenoid valve kit).

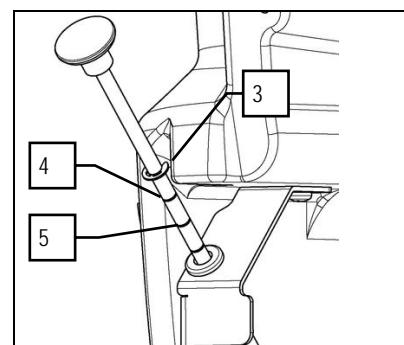


The solution flow can be mechanically limited by modifying the position of the elastic ring (3) on the lever (1). To do this, remove the rear casing (2). The flow varies in the following way:

**Current position:** the detergent solution flow is 108 litres/min

**Position 4:** the detergent solution flow is 60 litres/min

**Position 5:** the detergent solution flow is 36 litres/min



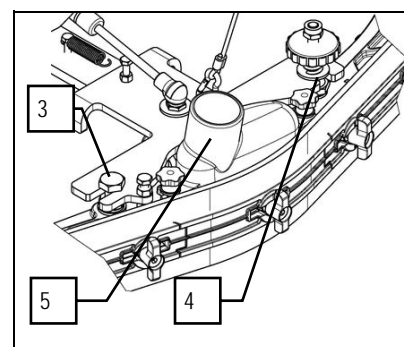
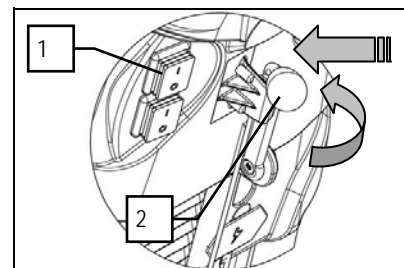
### 18. ASSEMBLING THE SQUEEGEE

The squeegee, that for reasons of packaging comes disassembled from the machine, must be assembled while assembling the machine. Proceed as follows for assembly:

1. Check the main machine switch (1) is set to "OFF"
2. Check the squeegee connection is raised from the floor; if necessary, lift it by means of lever (2)
3. Lift the squeegee and fit the left stud (3) in the left-hand slot on the squeegee connection
4. Rotate the squeegee, then fit the right stud (4) in the right-hand slot on the squeegee connection, keeping the spring and washer above the connection; this operation can be simplified by first loosening the handwheel on the pin.
5. Then retighten the handwheel to block the squeegee in place.
6. Insert the suction tube (5) in the appropriate sleeve in the squeegee.



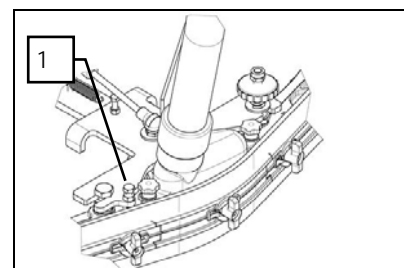
**WARNING:** these operations must be carried out using protective gloves to avoid any possible contact with the edges or tips of metal objects



### 19. SQUEEGEE INCLINATION

During working operation, the rear rubber is slightly tilted backwards (by about 5mm) in a uniform way for its whole length.

If it is necessary to increase the bend of the rubber in the central part, you must tilt the squeegee backwards, rotating the adjuster screw (1) clockwise.







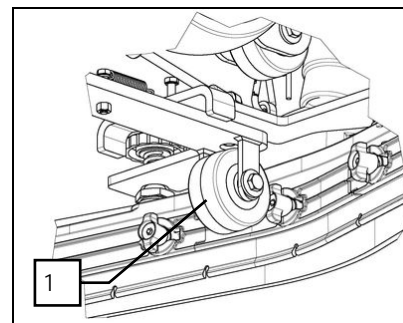
## MACHINE PREPARATION

### 20. ADJUSTING THE SQUEEGEE SUPPORT HEIGHT

The height of the squeegee must be adjusted on the basis of the state of wear and tear of the rubber. Carry out the following operations for adjustment:

1. Unscrew the locking nut
2. Raise or lower the wheel (1) by sliding it on the slot of the support
3. Block it by tightening the locking nut once the required height is reached.

**Note:** To facilitate the operation, completely lower the squeegee and put a spacer of a few millimetres (2 to 4 mm depending on the type of rubber) under the wheel.

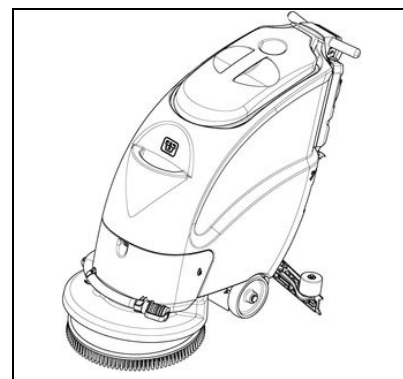


### 21. ASSEMBLING THE DISC BRUSH

1. Make sure the dirty water recovery tank is empty; if necessary, empty it completely.
2. Connect the battery connector to the machine connector (battery-operated version)
3. Connect the extension cable to the electric system cable, then connect the extension cable to the mains socket (electric version)
4. Press the main switch to "ON"



**WARNING:** during this operation, verify that there are no people or objects near the brush.



5. Position the brush on the floor, near the machine brush head
6. Raise the brush head by using the handlebars as a lever
7. Place the brush head above the brush
8. Pulse press the dead man's lever to engage the brush to the brush head



**WARNING!** During this operation, check there are no people or objects near the brushes



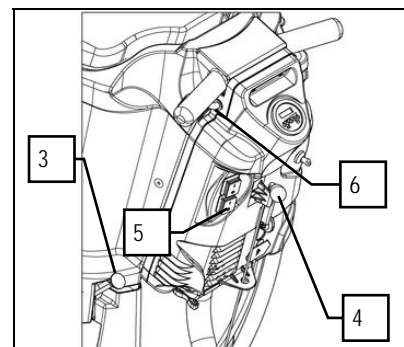
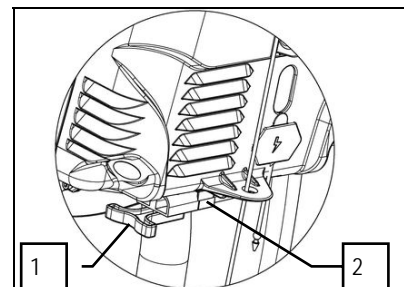
**WARNING:** you are advised to always wear protective gloves, to avoid the risk of serious injury to your hands



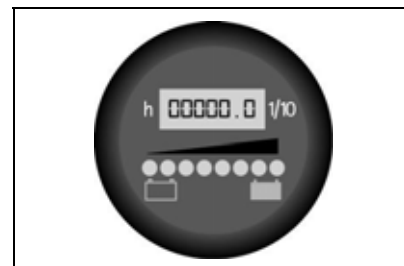
## WORK

### 22. PREPARING TO WORK

1. Make sure the dirty water recovery tank is empty; if necessary, empty it completely
2. Check the main machine switch is set to "OFF"
3. Check the brush is correctly inserted
4. Connect the battery connector cable (1) to the main machine connector cable (2) (battery-operated versions)
5. Connect the extension cable to the electric system cable, then connect the extension cable to the mains socket (electric version)
6. Press the main switch to "ON". Immediately, on the instrument panel, the display will turn on indicating the charge level of the batteries.
7. Adjust the amount of detergent solution by means of the lever (3) on the back of the machine.
8. Lower the squeegee by releasing lever (4) from its seat.
9. Activate the suction motor via the relevant switch (5) on the command panel in the rear part of the machine.
10. At this point, by using the dead man's lever (6) that activates the brushes, the machine can work efficiently until the detergent solution runs out or the batteries run flat.

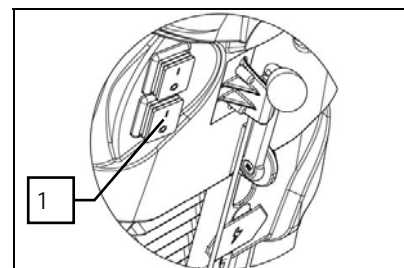


When the battery charge level is almost fully run down, a flashing red light will appear on the display and the brush motor will switch off automatically, but a residual charge will still allow you to complete the drying operation. The batteries must be recharged as soon as possible.



### 23. OVERFLOW DEVICE

The machine is NOT equipped with an overflow device, because the capacity of the dirty water recovery tank is greater than the capacity of the solution tank. In particular cases, there is a mechanical device (float) on the rear wall of the recovery tank; when the dirty water level is too high, this device shuts off the air to the suction motor in order to protect it - in this case, the noise made by the suction motor will be deeper. Turn off the suction motor via the switch (1). Then empty the dirty water recovery tank by means of the special drainage tube. It is good practice, when restoring the level of the solution tank, to empty the dirty water recovery tank via the special drainage tube.



### 24. FORWARD MOVEMENTS

The traction of these machines is obtained by means of the brush which, working with the right weight distribution, is able to drag the machine forwards.



**WARNING:** when making even brief reverse movements, verify that the squeegee is raised.



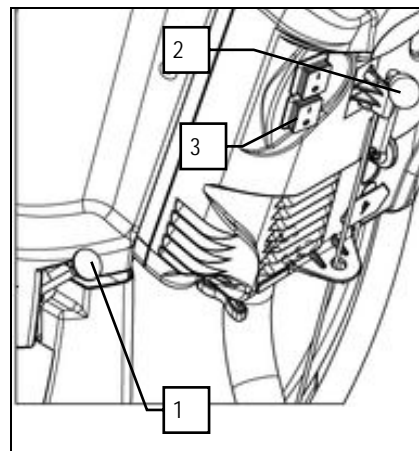
## AT THE END OF THE WORK

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

1. Turn off the detergent solution tap (1) on the rear part of the machine
2. Lift the squeegee by inserting the squeegee cable tie-rod (2) in its seat on the back of the machine
3. Deactivate the suction motor via the relevant switch (3) on the command panel in the rear part of the machine
4. Disconnect the machine battery connector (battery-operated version)
5. Disconnect the power cable from the mains socket (electric versions)
6. Take the machine to the designated place for draining off the dirty water



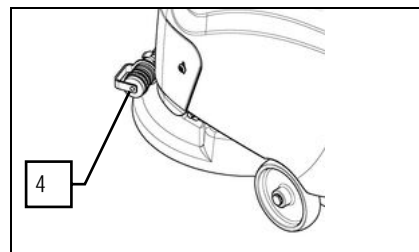
**WARNING:** Make sure the solution tap is turned off after using the machine; otherwise, the detergent solution will continue coming out (versions without the optional solenoid valve kit).



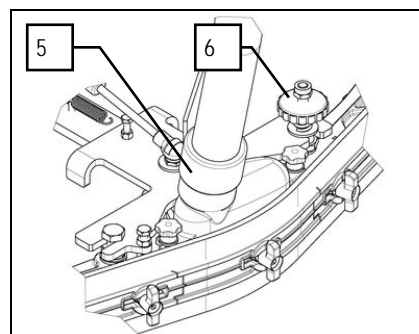
7. Disconnect the tube (4) from its seat, unscrew the drainage cap and empty the dirty water recovery tank.



**WARNING:** this operation must be carried out by using gloves in order to protect against contact with dangerous solutions



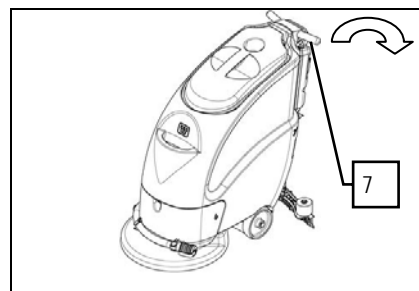
8. Slide the suction tube (5) from the squeegee sleeve
9. Remove the squeegee from its support arm by loosening the handwheel (6)
10. Clean both the squeegee and the rubbers well, using a jet of water
11. After cleaning the squeegee and rubbers, replace the squeegee on the initial support, firstly inserting the left pin of the squeegee in the left slot of the arm, then the right pin in the right slot, being careful to keep the spring and washer on the plate of the arm. This can be simplified by first loosening the handwheel on the pin. Then retighten the handwheel to block the squeegee in place.
12. Finally, insert the squeegee tube in the special sleeve



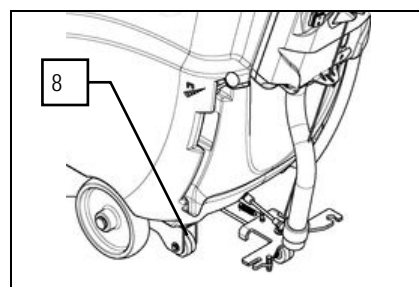
13. Park the machine in a closed place, on a flat and level surface, where it cannot cause harm to people or damage to other property, but also be protected from any accidental fall of objects.



**WARNING:** Park the machine in a closed 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:** To bring the machine to its idle position, tilt it backwards by pressing on the handles (7) until the small wheel (8) is resting on the floor.



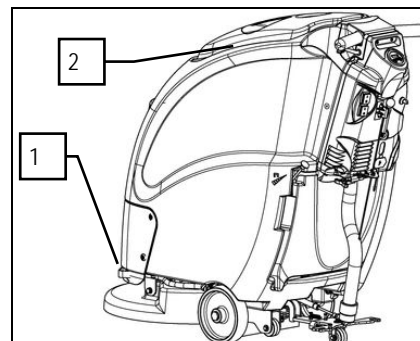


## DAILY MAINTENANCE

### PERFORM ALL MAINTENANCE OPERATIONS IN SEQUENCE

#### 25. CLEANING THE DIRTY WATER RECOVERY TANK

1. Disconnect the tube (1) from its seat, unscrew the drainage cap, and empty the dirty water recovery tank.
2. Remove the cover from the dirty water recovery tank (2).
3. Clean and rinse the recovery tank and the suction pipe (connecting pipe between the squeegee and the tank).
4. Replace the cap on the drainage tube, and the cover on the dirty water recovery tank.



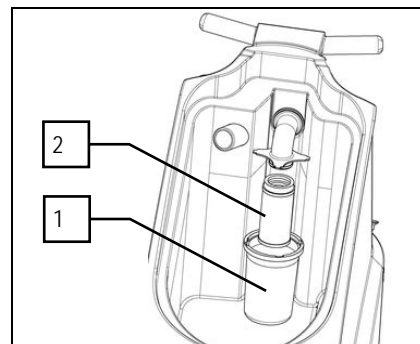
**WARNING:** before carrying out any type of maintenance, put the main switch on "OFF" and disconnect the machine battery connector (battery-operated version) or disconnect the power supply cable from the mains socket (electric version).



**WARNING:** this operation must be carried out by using gloves in order to protect against contact with dangerous solutions

#### 26. CLEANING THE SUCTION MOTOR FILTER

1. Remove the cover from the dirty water recovery tank
2. Make sure the dirty water tank is empty; if necessary, empty it
3. Remove the suction filter protection (1) by rotating it clockwise
4. Remove the suction filter (2) from its seat
5. Use a jet of water to clean the walls and base of the filter
6. Reassemble all the elements



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



**WARNING:** before carrying out any type of maintenance, put the main switch on "OFF" and disconnect the machine battery connector (battery-operated version) or disconnect the power supply cable from the mains socket (electric version).

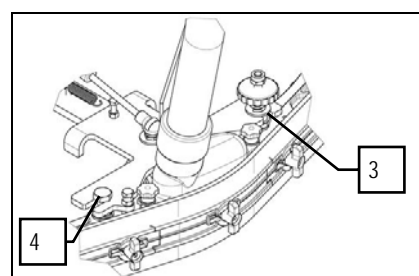
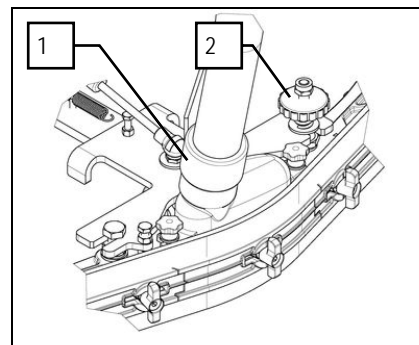


## DAILY MAINTENANCE

### 27. CLEANING THE SQUEEGEE

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

1. Check the main machine switch is set to "OFF"
2. Make sure the battery connector is disconnected from the machine connector (battery-operated versions)
3. Make sure the power supply cable is disconnected from the mains socket
4. Detach the suction tube sleeve from the nozzle (1) on the squeegee
5. Turn the knob (2) anticlockwise
6. Take the pin (3) out of the slot on the squeegee connection
7. Take the pin (4) out of the slot on the squeegee connection
8. Clean both the squeegee and the rubbers well, using a jet of water



If the front rubber of the squeegee is worn, this will affect suction so the machine will not dry perfectly. If this is the case, replace the rubber (see REPLACING THE FRONT SQUEEGEE RUBBER).  
If the rear rubber of the squeegee is worn, this will affect suction so the machine will not dry perfectly. If this is the case, replace the rubber (see REPLACING THE REAR SQUEEGEE RUBBER).



**WARNING:** before carrying out any type of maintenance, put the main switch on "OFF" and disconnect the machine battery connector (battery-operated version) or disconnect the power supply cable from the mains socket (electric version).



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

### 28. CLEANING THE SOLUTION TANK

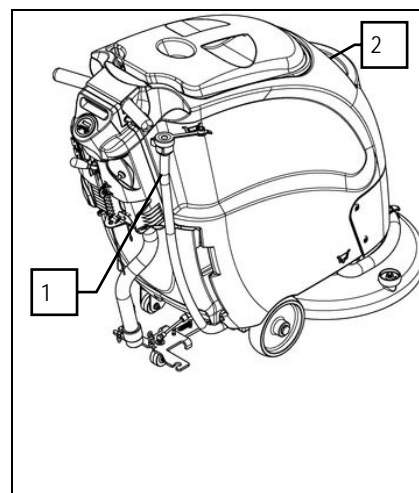
1. Turn off the detergent solution tap
2. Disconnect the clean water drainage tube (1) from its housing on the back right side of the machine, and empty the tank
3. Remove the clean water filling filter (2) from the filling nozzle of the solution tank
4. Clean the clean water filling filter
5. rinse the inside of the tank with a jet of water



**WARNING:** before carrying out any type of maintenance, put the main switch on "OFF" and disconnect the machine battery connector (battery-operated version) or disconnect the power supply cable from the mains socket (electric version).



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

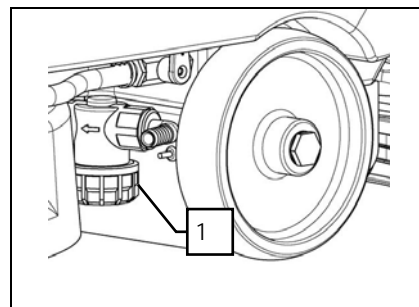




## DAILY MAINTENANCE

### 29. CLEANING THE DETERGENT SOLUTION FILTER (OPTIONAL)

1. Make sure the dirty water recovery tank is empty; if necessary, empty it completely
2. Check the main machine switch is set to "OFF"
3. Disconnect the battery connector cable from the machine connector cable (battery-operated versions)
4. Disconnect the power cable from the mains socket (electric versions)
5. Turn off the detergent solution tap
6. Unscrew the cap (1) of the solution filter
7. Remove the solution filter cartridge and clean it under running water
8. Reassemble all the elements

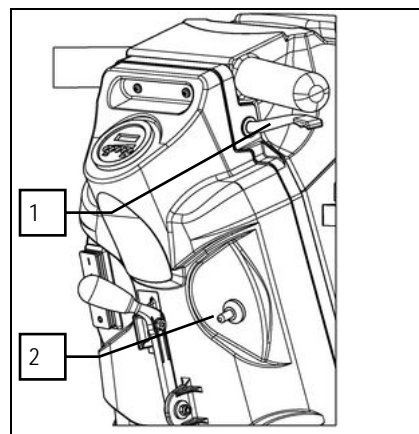


### 30. DISASSEMBLING THE DISC BRUSHES (B VERSION)

1. Activate the main switch by turning it to "ON"
2. Lift the machine by means of the handlebars
3. Press the dead man's levers (1)
4. Activate the bipolar switch by pulling the lever (2) down



**WARNING:** during this operation, verify that there are no people or objects near the brush.

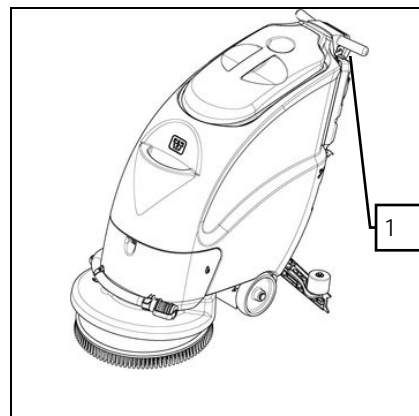


### 31. DISASSEMBLING THE DISC BRUSHES (E VERSION)

5. Activate the main switch by turning it to "ON"
6. Lift the machine by means of the handlebars
7. Pulse press the dead man's levers (1)



**WARNING:** during this operation, verify that there are no people or objects near the brush.



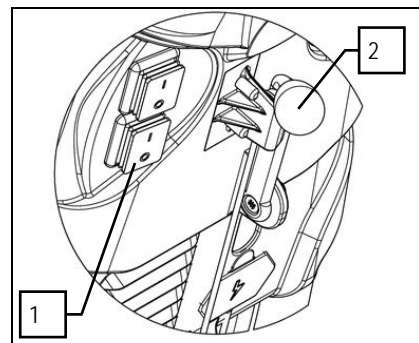


## WEEKLY MAINTENANCE

### 32. CLEANING THE SUCTION TUBE

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

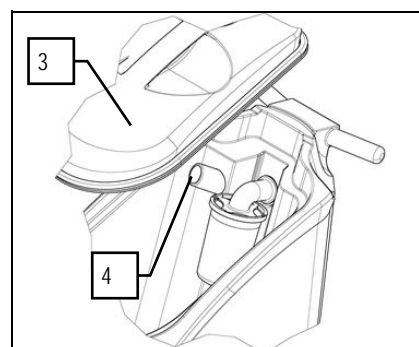
1. Deactivate the main switch (1) by turning it to "OFF"
2. Lift the squeegee by means of the cable control lever (2)
3. Remove the suction hose from the squeegee nozzle
4. Make sure the dirty water recovery tank is empty; if necessary, empty it completely
5. Remove the cover from the dirty water recovery tank (3)
6. Clean the tube with a water jet inserted from the side where it enters the tank (4)
7. Reassemble all the elements



**WARNING:** before carrying out any type of maintenance, put the main switch on "OFF" and disconnect the machine battery connector (battery-operated version) or disconnect the power supply cable from the mains socket (electric version).



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



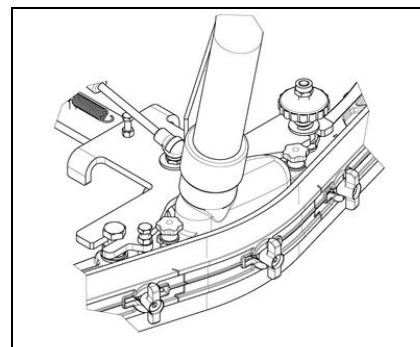


## EXTRAORDINARY MAINTENANCE

### 33. REPLACING THE FRONT SQUEEGEE RUBBER

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

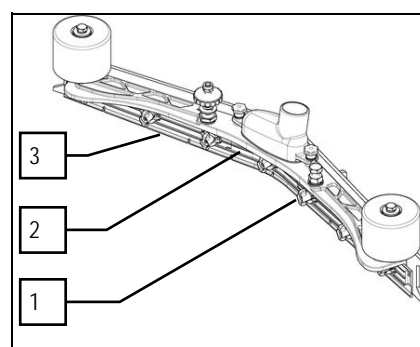
1. Deactivate the main switch by turning it to "OFF"
2. Remove the squeegee from its support arm by unscrewing the handwheel
3. Turn the wing nuts (1) to the horizontal position
4. Remove the front rubber-pressing blades (2)
5. Remove the rubber (3) and replace it
6. Proceed in reverse to replace the rubber



**WARNING:** before carrying out any type of maintenance, put the main switch on "OFF" and disconnect the machine battery connector (battery-operated version) or disconnect the power supply cable from the mains socket (electric version).



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

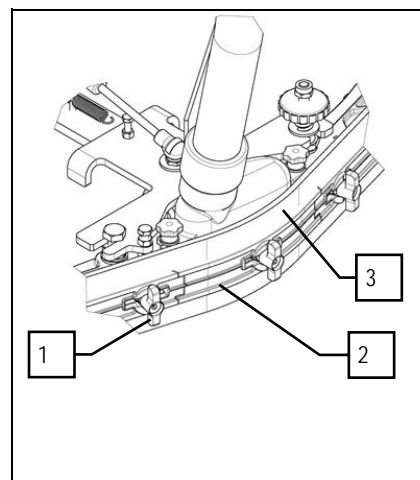


### 34. REPLACING THE REAR SQUEEGEE RUBBER

If the squeegee rear rubber is worn and does not dry well, it is possible to change the drying edge using one of the 4 edges of the rubber.

This operation can be done both with a squeegee fitted or removed as follows:

1. Deactivate the main switch by turning it to "OFF"
2. Turn the wing nuts (1) to the horizontal position
3. Remove the rear rubber-pressing blades (2).
4. Remove the rubber (3) and replace it
5. adjust the height of the squeegee depending on the rubber (see "ADJUSTING THE HEIGHT OF THE SQUEEGEE SUPPORT")



**WARNING:** before carrying out any type of maintenance, put the main switch on "OFF" and disconnect the machine battery connector (battery-operated version) or disconnect the power supply cable from the mains socket (electric version).



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

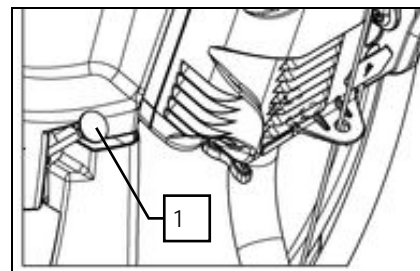




## TROUBLESHOOTING

### 35. INSUFFICIENT WATER ON THE BRUSHES

1. Check there is water in the solution tank
2. Check the tap (1) is turned on
3. Clean the solution filter cartridge (behind the brush head casing - optional)



### 36. THE SQUEEGEE DOES NOT DRY PERFECTLY

1. Check the squeegee is clean.
2. Check the regulation of the squeegee (see "MACHINE PREPARATION").
3. Clean the entire suction unit (see "WEEKLY MAINTENANCE").
4. Replace the rubbers, if worn.

### 37. THE MACHINE DOES NOT CLEAN WELL

1. Check the state of wear and tear of the brush and, if necessary, replace it. The brush should be replaced when the bristles are about 15mm long. To replace it, refer to "REPLACING THE BRUSH", or "DISASSEMBLING THE BRUSH" and "ASSEMBLING THE BRUSH". Working with over-worn brushes may cause damage to the floor.
2. Use a different kind of brush to the one fitted as standard. For cleaning floors where the dirt is particularly resistant, we recommend the use of special brushes supplied upon request and according to needs (see "CHOOSING AND USING THE BRUSHES").

### 38. EXCESSIVE FOAM PRODUCTION

Verify that a low foam detergent has been used. If necessary, add a small quantity of antifoam liquid to the recovery tank.

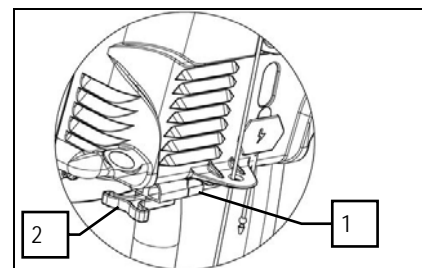
Remember that, when the floor is not very dirty, more foam is generated. In this case the detergent solution should be more diluted.

### 39. THE SUCTION MOTOR DOES NOT FUNCTION

1. Check whether the dirty water recovery tank is full and, if necessary, empty it.
2. Check the float in the dirty water recovery tank is working well (see also "CLEANING THE DIRTY WATER RECOVERY TANK" in the chapter "DAILY MAINTENANCE")

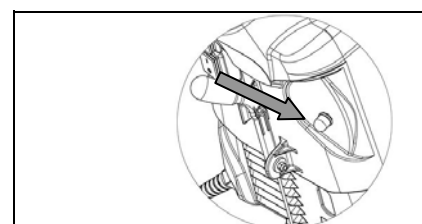
### 40. THE MACHINE DOES NOT START

1. Check the machine connector (1) is connected to the batteries (2) (battery-operated version)
2. Check the power supply cable is connected to the mains socket (electric version)
3. Check the main switch is "ON"
4. Check the batteries are charged



### 41. ELECTRIC SYSTEM SAFETY (E Version)

The machine is fitted with a thermal trip unit with manual reset, located in the rear part of the machine near the main switch. The brush motor is reset by pressing the thermal trip unit button. If the machine stops repeatedly in a short space of time, you must contact the COMAC technical assistance centre.





## 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 the following materials and send them to the appropriate collection centres in accordance with the environmental hygiene regulations currently in force:

- brushes
- filter
- electric and electronic parts\*
- batteries
- plastic parts (tanks and handlebars)
- metal parts (levers and frame)

(\*) In particular, to scrap the electric and electronic parts, contact your area distributor



## CHOOSING AND USING THE BRUSHES

### POLYPROPYLENE BRUSH (PPL)

Used on all types of floors. Good resistance to wear and tear, and hot water (no greater than 60°C). The Polypropylene brush is non-hygroscopic and therefore retains its characteristics even when working in wet conditions.

### ABRASIVE BRUSH

The bristles of this type of brush are charged with highly aggressive abrasives. It is used to clean very dirty floors. To avoid floor damage, work only with the pressure strictly necessary.

### THICKNESS OF THE BRISTLES

Thicker bristles are more rigid and are therefore used on smooth floors or floors with small joints.

On uneven floors or those with deep joints, it is advisable to use softer bristles which can enter the gaps more easily.

Remember that when the bristles are worn and therefore too short, they will become rigid and are no longer able to penetrate and clean deep down. In this case, like with overlarge bristles, the brush tends to jump.

### PAD HOLDER

The pad holder is recommended for cleaning shiny surfaces.

There are two types of pad holder:

1. the traditional pad holder is fitted with a series of anchor points that allow the abrasive floor pad to be held and dragged while working
2. the CENTRE LOCK type pad holder not only has anchor points, but also a snap-type central locking system in plastic that allows the abrasive floor pad to be perfectly centred and held without any risk of it becoming detached. This type of dragging device is recommended above all for machines with more than one brush, where the centring of the abrasive discs is difficult.

TABLE FOR CHOOSING THE BRUSHES

Machine	No. of brushes	Code	Type of bristles	Ø Bristl	Ø Brush	Length	Notes
L20 B-E	1	404653	PPL	0.9	508	-	BRUSH
		404654	PPL	0.3	508	-	BRUSH
		405631	PPL	0.6	508	-	BRUSH
		405632	ABRASIVE	1	508	-	BRUSH
		405527	-	-	500	-	PAD HOLDER



## EC DECLARATION OF CONFORMITY

The undersigned company:  
**COMAC S.p.A.**  
Via IMaestri del Lavoro no. 13  
37059 Santa Maria di Zevio (VR)  
declares under its sole responsibility that the products

### SCRUBBING MACHINES mod. L20 B

comply with the requirements of the following Directives:

- 2006/42/EC: Machinery Directive
- 2006/95/EC: Low Voltage Directive
- 2004/108/EC: Electromagnetic Compatibility Directive

They also comply with the following standards:

- EN 60335-1: Household and similar electrical appliances - Safety. Part 1: General regulations
- EN 60335-2-72: Household and similar electrical appliances. Part 2: Generic standards for automatic machines for floor treatment for commercial and industrial use
- EN 60335-2-29: Household and similar electrical appliances. Part 2: Special standards for battery chargers.
- EN 12100-1: Machine safety - Fundamental concepts, fundamental principles of design - Part 1: Basic terminology and methodology
- EN 12100-2: Machine safety - Fundamental concepts, fundamental principles of design - Part 2: Technical principles
- EN 61000-6-2: Electromagnetic compatibility (EMC) - Part 6-2: Generic standards – Immunity for industrial environments.
- EN 61000-6-3: Electromagnetic compatibility (EMC) - Part 6-3: Generic standards — Standard emission for residential, commercial and light-industrial environments.
- EN 61000-3-2: Electromagnetic compatibility (EMC) - Part 3-2: Limits – Limits for harmonic current emissions (Equipment with input current  $\leq 16$  A per phase).
- EN 61000-3-3: Electromagnetic compatibility (EMC) - Part 3-3: Limits – Restriction of voltage variations and flicker in low voltage power supply systems for devices with a rated current  $\leq 16$  A.
- EN 55014-1: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 1: Emission - Regulation for product family.
- EN 55014-2: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 2: Immunity - Regulation for product family.
- EN 62233: Household and similar electrical appliances - Electromagnetic fields Methods for evaluation and measurement

The person authorised to compile the technical file:

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

Santa Maria di Zevio, 09/09/2011

COMAC S.p.A.  
Legal representative  
Giancarlo Ruffo



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**SCRUBBING MACHINES mod. L20 E 110V - L20 E 230V**

comply with the requirements of the following Directives:

- 2006/42/EC: Machinery Directive
- 2006/95/EC: Low Voltage Directive
- 2004/108/EC: Electromagnetic Compatibility Directive

They also comply with the following standards:

- EN 60335-1: Household and similar electrical appliances - Safety. Part 1: General regulations
- EN 60335-2-72: Household and similar electrical appliances. Part 2: Specific standards for automatic machines for floor treatment for commercial and industrial use
- EN 12100-1: Machine safety - Fundamental concepts, fundamental principles of design - Part 1: Basic terminology and methodology
- EN 12100-2: Machine safety - Fundamental concepts, fundamental principles of design - Part 2: Technical principles
- EN 55014-1: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 1: Emission - Regulation for product family.
- EN 55014-2: Electromagnetic compatibility - Regulations for household appliances, electrical devices and similar equipment. Part 2: Immunity - Regulation for product family.
- EN 61000-3-2: Electromagnetic compatibility (EMC) - Part 3-2: Limits – Limits for harmonic current emissions (Equipment with input current  $\leq 16$  A per phase).
- EN 61000-3-3: Electromagnetic compatibility (EMC) - Part 3-3: Limits – Restriction of voltage variations and flicker in low voltage power supply systems for devices with a rated current  $\leq 16$  A.
- EN 62233: Household and similar electrical appliances - Electromagnetic fields Methods for evaluation and measurement

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