

# USE AND MAINTENANCE MANUAL



ABILA 45 - 50 - 42 – 52  
B – BT - E

ED. 01-2010

EN

ORIGINAL  
INSTRUCTIONS  
Doc. 10022288  
Ver. AA



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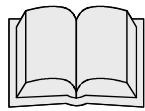
#### **Symbols used in the manual**

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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

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Warning symbol  
Read carefully the sections marked with this symbol, for the safety of the operator and the machine

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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

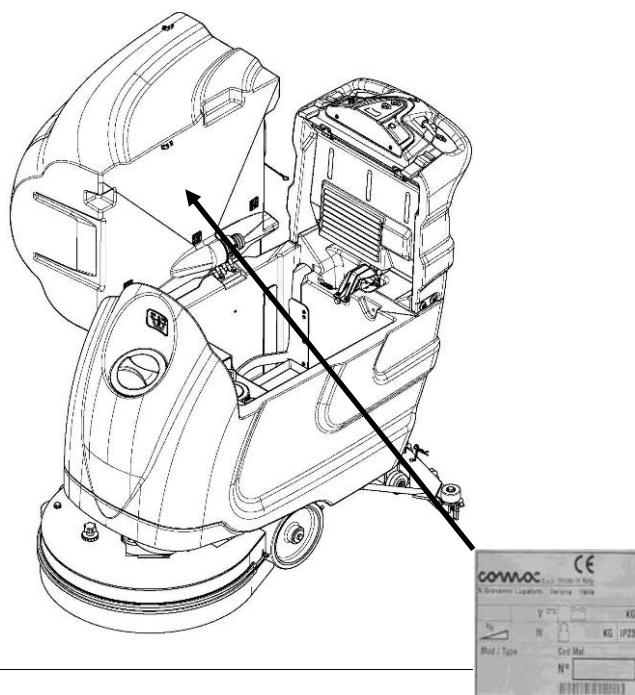
When the machine is delivered to the customer, an immediate check must be performed to ensure all the material mentioned in the shipping documents has been received, and also to check the machine has not been damaged during transportation. If this is the case, the carrier must ascertain the extent of 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

This is a scrubbing machine which, via the mechanical action of the rotating brush and the chemical action of a water/detergent solution, can clean any type of flooring. As it advances, it also collects the dirt removed and the detergent solution not absorbed by the floor.

**The machine must be used only 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 using the machine. If necessary, remember that our assistance service (organised in collaboration with our dealers) is always available for advice or direct intervention.

## Serial number plate



TECHNICAL DESCRIPTION	UM	Abila 45B	Abila 50B	Abila 42B	Abila 52B
Rated power	W	950	950	950	950
Working width	mm	420	500	400	500
Width of rear squeegee	mm	660	760	660	760
Work capacity, up to	m <sup>2</sup> /h	1470	1750	1470	1750
Brushes (diameter and quantity)	Ø mm	420 x 1	500 x 1	210 x 2	255 x 2
Brush rotations	rpm	140	140	340	275
Pressure on the brushes	kg	20	20	20	22
Brush motor	V / W	24/400	24/400	24/400	24/400
Type of advance		Semiautomatic	Semiautomatic	Semiautomatic	Semiautomatic
Maximum gradient	%	2	2	2	2
Forward speed	km/h	-	-	-	-
Suction motor	V / W	36/550	36/550	36/550	36/550
Suction vacuum	mbar	188	188	188	188
Traction motor	V / W	-	-	-	-
Solution tank PE	l	48	48	48	48
Recovery tank PE	l	54	54	54	54
Total machine weight in running order (including batteries)	kg	195	195	195	195
Batteries (Voltage / Maximum capacity )	V / AhC5	12/105 (2)	12/105 (2)	12/105 (2)	12/105 (2)
Maximum weight of batteries	kg	63	63	63	63
Battery charger *	V/A	24/9	24/9	24/9	24/9
Battery compartment dimensions (Length / Height / Width)	mm	350x290x330	350x290x330	350x290x330	350x290x330
Machine dimensions (Length / Height / Width)	mm	1128x1005x490	1180x1005x490	1070x1005x490	1110x1005x490
Noise level (in compliance with IEC 704/1)	dB (A)	62	62	62	62
Vibration level	m/s <sup>2</sup>	0,75	0,75	0,75	0,75

- CB versions with built-in battery charger



TECHNICAL DESCRIPTION	UM	Abila 45BT	Abila 50BT	Abila 42BT	Abila 52BT
Rated power	W	1100	1100	1100	1100
Working width	mm	420	500	400	500
Width of rear squeegee	mm	660	760	660	760
Work capacity	m <sup>2</sup> /h	1470	1750	1470	1750
Brushes (diameter and quantity)	Ø mm	420 x 1	500 x 1	210 x 2	255 x 2
Brush rotations	rpm	140	140	340	275
Pressure on the brushes	kg	20	20	20	22
Brush motor	V / W	24/400	24/400	24/400	24/400
Type of advance		Automatic	Automatic	Automatic	Automatic
Maximum gradient	%	2	2	2	2
Forward speed	km/h	4	4	4	4
Suction motor	V / W	36/550	36/550	36/550	36/550
Suction vacuum	mbar	188	188	188	188
Traction motor	V / W	24/150	24/150	24/150	24/150
Solution tank PE	l	48	48	48	48
Recovery tank PE	l	54	54	54	54
Total machine weight in running order	kg	210	210	210	210
Batteries	V / AhC5	12/105 (2)	12/105 (2)	12/105 (2)	12/105 (2)
Battery weight	kg	63	63	63	63
Battery charger *	V/A	24/9	24/9	24/9	24/9
Battery compartment dimensions (Length / Height / Width)	mm	350x290x330	350x290x330	350x290x330	350x290x330
Machine dimensions (Length / Height / Width)	mm	1128x1005x490	1180x1005x490	1070x1005x490	1110x1005x490
Noise level (in compliance with IEC 704/1)	dB (A)	62	62	62	62
Vibration level	m/s <sup>2</sup>	0,75	0,75	0,75	0,75

- \* CB models with built-in battery charger

TECHNICAL DESCRIPTION	UM	Abila 45E	Abila 50E
Rated power	W	1100	1100
Working width	mm	420	500
Width of rear squeegee	mm	660	760
Work capacity	m <sup>2</sup> /h	1470	1750
Brushes (diameter and quantity)	Ø mm	420 x 1	508 x 1
Brush rotations	rpm	240	240
Pressure on the brushes	kg	20	20
Brush motor	V / W / Hz	230/750/50	230/750/50
Type of advance		Semiautomatic	Semiautomatic
Maximum gradient	%	2	2
Forward speed	km/h	-	-
Suction motor	V / W	230/450	230/450
Suction vacuum	mbar	188	188
Traction motor	V / W	-	-
Solution tank PE	l	48	48
Recovery tank PE	l	54	54
Total machine weight in running order	kg	210	210
Batteries	V / AhC5	-	-
Battery weight	kg	-	-
Battery charger *	V/A	-	-
Battery compartment dimensions (Length / Height / Width)	mm	-	-
Machine dimensions (Length / Height / Width)	mm	1128x1005x490	1180x1005x490
Noise level (in compliance with IEC 704/1)	dB (A)	62	62
Vibration level	m/s <sup>2</sup>	0,75	0,75



## SYMBOLS USED ON THE MACHINE



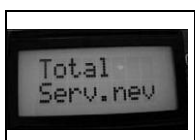
Tap symbol  
Used to indicate water regulation changes (CDS versions)



Detergent symbol  
Used to indicate detergent regulation changes (CDS versions)



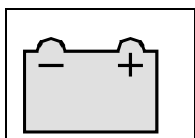
Indicator showing battery charge level on the upper line and hour-counter on the lower line (B-BT versions)



Indicator showing the type of hour-counter (total) on the upper line and the type of service (none) on the lower line



Indicator showing the type of technology of the batteries used (lead) (B-BT versions)



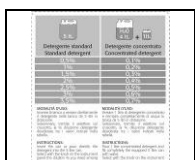
Battery symbol (B-BT versions)



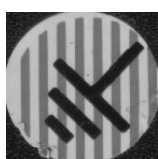
Indicates the maximum temperature of the detergent solution  
Located near the solution tank inlet



Indicates the risk of crushed hands



Indicates the instructions for dosing the detergent in the canister (CDS version)



Indicates the earth connection point of the electric system of the machine (E versions)



## GENERAL SAFETY REGULATIONS

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

- ☐ 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 used exclusively by authorised, trained personnel.
- ☐ During the working of the machine, pay attention to other people and especially to children.
- ☐ The machine is not suitable for cleaning carpets.
- ☐ The socket for the battery charger cable must have a prescribed earth connection.
- ☐ Avoid damaging the battery charger cable by crushing or bending it, or applying stress.
- ☐ If you notice any damage to the battery charger cable, contact a **COMAC S.p.A.** technical assistance centre immediately.
- ☐ Do not mix different types of detergent as this may produce harmful gases.
- ☐ Do not place any liquid containers on the machine.
- ☐ 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%.
- ☐ Do not use the machine in an explosive atmosphere.
- ☐ Do not use the machine as a means of transport.
- ☐ Do not use acid solutions, which may damage the machine.
- ☐ Avoid working with the brushes when the machine is standing still, so as not to damage the floor.
- ☐ Do not vacuum inflammable liquids.
- ☐ Do not use the device to collect dangerous powders.
- ☐ 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.
- ☐ Do not use the machine on surfaces with an inclination greater than the one shown on the plate.
- ☐ The machine is designed to carry out the washing and drying operations simultaneously. 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, request the intervention of a **COMAC S.p.A.** technical assistance centre.
- ☐ If you need to replace any components, request the ORIGINAL spare parts from a **COMAC S.p.A.** dealer and/or Authorised Retailer.
- ☐ Before carrying out any maintenance work, switch off the machine and disconnect the battery connector.
- ☐ 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.
- ☐ Send the machine to a **COMAC S.p.A.** technical assistance centre for servicing at least once a year.
- ☐ To prevent the formation of scale in the solution tank filter, do not fill the tank with detergent solution many hours before using the machine.
- ☐ Before using the machine, check that all the hatches and covers are positioned as shown in this Manual.
- ☐ When disposing of consumption materials, observe the laws and regulations in force.
- ☐ When your **COMAC S.P.A.** machine has reached the end of its long working life, dispose of the materials it contains in an appropriate manner, and bearing in mind that the machine itself was constructed using 100% recyclable materials.
- ☐ Only use the brushes supplied with the device, or those specified in the Use and Maintenance Manual (page 29). The use of other brushes could compromise safety levels.
- ☐ The device must be disconnected from the power supply before removing the battery.
- ☐ The battery must be removed from the device before this is disposed of.
- ☐ The battery and battery charger must be disposed of in a safe manner, scrupulously respecting the laws in force.
- ☐ The machine is not suitable for use by children or people with reduced physical, mental and sensorial capacities, or people lacking experience and knowledge, unless supervised and instructed in the use of the machine by a person responsible for their safety.
- ☐ Children must be supervised to ensure they do not play with the device.
- ☐ The machine must be used mainly in closed environments, and never left outside, in damp areas.
- ☐ Check all covers and tanks are correctly fixed on the machine.
- ☐ The elements of the batteries used must have a cell voltage no greater than 2.7V.



## MACHINE PREPARATION

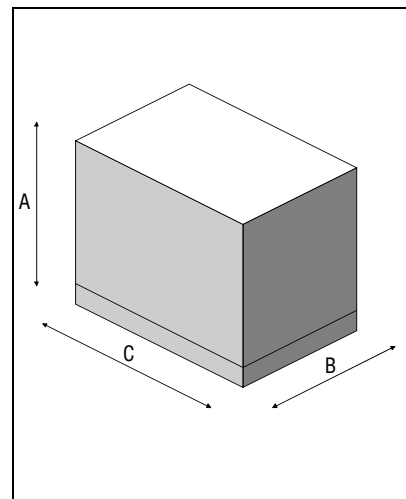
### 1. INTENDED USE

The scrubbing machine is designed exclusively for the professional cleaning of surfaces and floors in industrial, commercial and public environments. In addition, only use the machine in closed or at least covered environments.

### 2. HANDLING THE PACKED MACHINE

The machine is contained in specific packaging.  
It is not possible to place more than two packages on top of each other.  
The overall dimensions of the package are:

	ABILA 2010
A	1145mm
B	665mm
C	1230mm

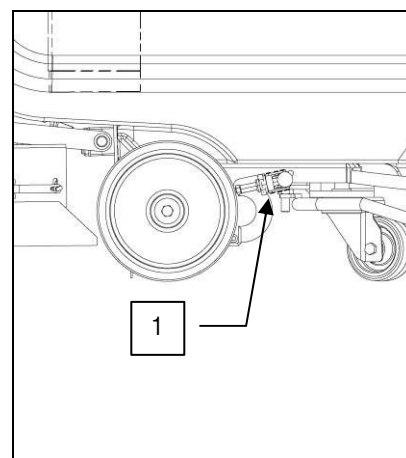
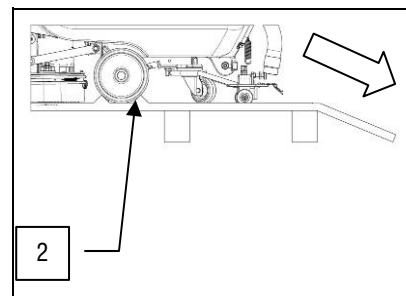


### 3. HOW TO UNPACK THE MACHINE

1. Remove the outer packaging.
2. Disengage the parking brake, by means of the lever on the left wheel of the machine (1)
3. The machine is secured to the pallet with wedges that lock the wheels, remove these wedges (2)
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 base.
5. Keep the pallet for any future transport needs.



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

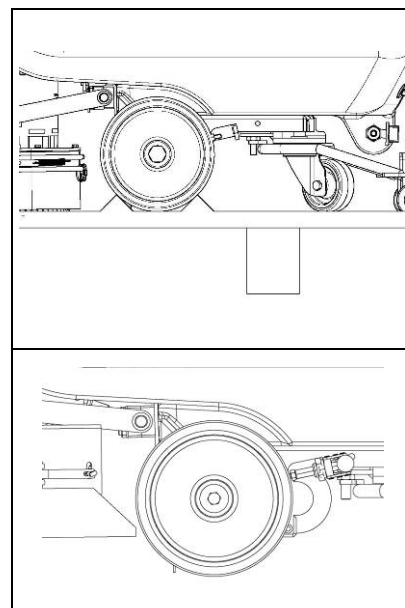




## MACHINE PREPARATION

### 4. HOW TO MOVE THE MACHINE

1. To safely move the machine, you should use a pallet to support it (positioning wooden wedges to block the wheels, as shown in the previous paragraph).
2. Lower the squeegee by means of the lever at the rear of the machine. To assemble the squeegee, read the "ASSEMBLING THE SQUEEGEE" paragraph.
4. Lower the base allowing the brushes to rest by means of the lever on the right rear of the machine.
5. Stop the machine by operating the brake lever located behind the left wheel of the machine.



### 5. INSERTING/CONNECTING THE BATTERIES (B-BT versions)

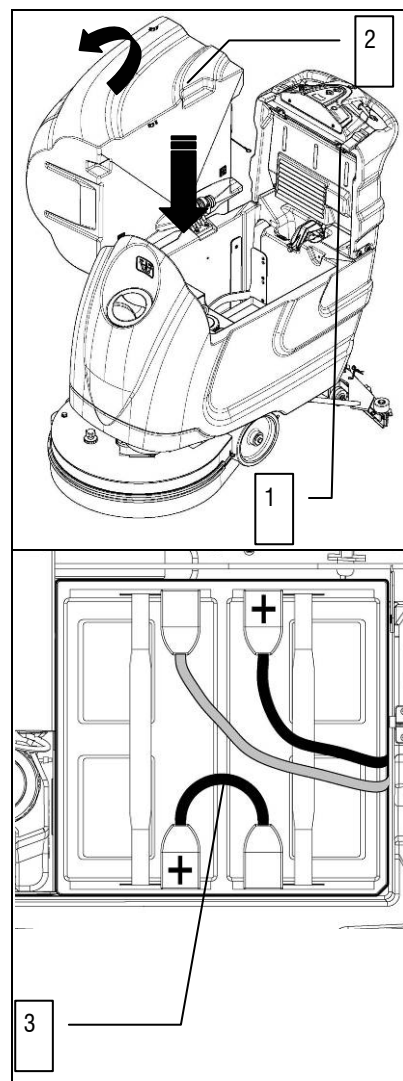
The machine may be supplied with batteries and a built-in battery charger. If batteries other than those supplied with the machine are used, have the battery charger and battery control card configuration checked by a qualified, COMAC-trained technician.

Perform a battery charging cycle before using the machine.

The batteries must be housed in the special compartment beneath the recovery tank.

To insert the batteries you must:

1. Engage the machine's parking brake
2. Lower the squeegee and base (see the appropriate chapter)
3. release the hinges (1) on the handlebars
4. Rotate the recovery tank as far as it will go, using the side handle (2).
5. Lift the batteries by means of the grips on the upper part
6. house the batteries in the compartment, positioning the poles "+" and "-" opposite each other
7. Check that the machine's master switch is in the "OFF" position
8. connect the batteries in series - using the supplied jumper cable (3) - to the poles "+" and "-"
9. Connect the battery connector cable to the terminal poles "+" and "-" to obtain a voltage of 24V on the terminals



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



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



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



## MACHINE PREPARATION

### 6. BATTERY TYPE (B-BT versions)

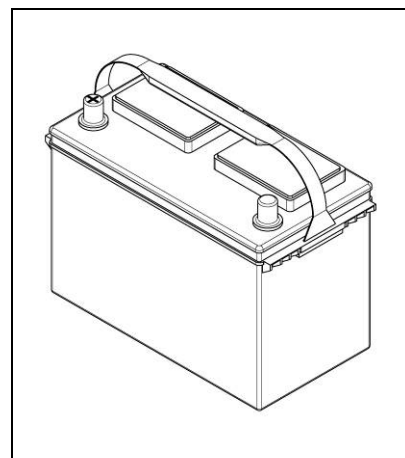
To power the machine it is necessary to use:

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

OTHER TYPES MUST NOT BE USED.

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

Every battery consists of DIN-type elements connected in series and supplying 6V power to the clamps. You are advised to use batteries with an electric capacity of 200 Ah (C5).



### 7. BATTERY MAINTENANCE AND DISPOSAL (Versioni B-BT)

For maintenance and recharging, respect 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.

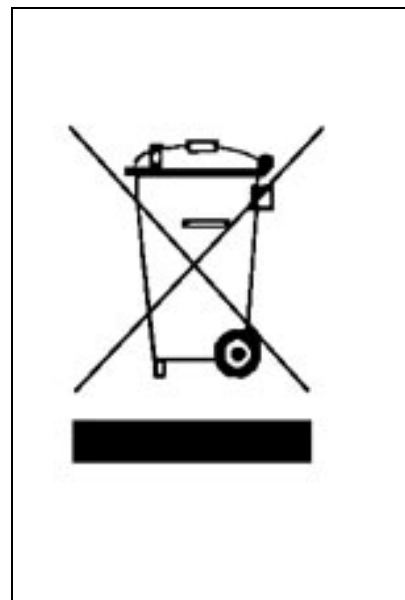
When the battery reaches the end of its working life, it must be disconnected by expert, trained personnel, then lifted (using the grips and suitable lifting devices) to remove it from the battery compartment. EXHAUSTED BATTERIES ARE CLASSIFIED AS DANGEROUS WASTE AND MUST BE CONSIGNED TO THE AUTHORISED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



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



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

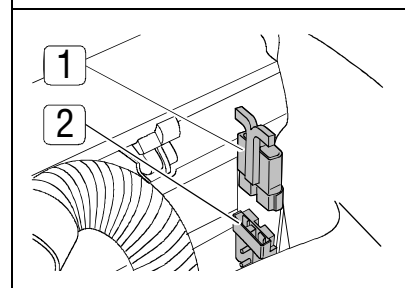
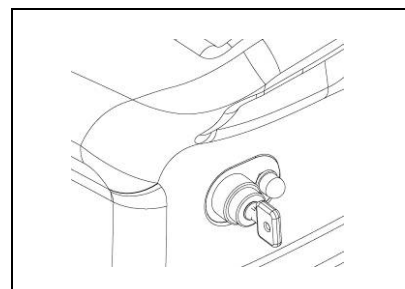


### 8. RECHARGING THE BATTERIES (VERSIONS WITH EXTERNAL BATTERY CHARGER) (B-BT Versions)

**ATTENTION:** Please read carefully the use and maintenance instructions of the battery charger that is included with the machine.

To charge the batteries you must:

1. Turn the key of the master switch anticlockwise to the "OFF" position.
2. Check that there is no water inside the recovery tank.
3. Engage the parking brake located on the left side of the machine.
4. Disconnect the hinge on the upper part of the handlebars.
5. Turn the recovery tank as far as it will go

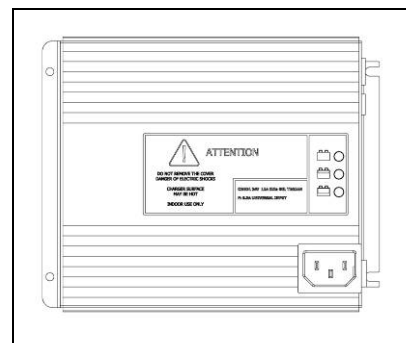




6. Disconnect the machine connector (1) of the battery connector (2).
7. Connect the battery charger connector to the battery connector (2).
8. Wait for the green LED of the battery charger to light.
9. Disconnect the battery charger connector from the battery connector (2).
10. Connect the machine connector (1) to the battery connector (2)



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



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

**ATTENTION:** 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

**ATTENTION:** never leave the batteries completely discharged, even if the machine is not being used

**ATTENTION:** 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 expert personnel, trained at the COMAC assistance centre



**ATTENTION:** danger of exhalation of gas and leakage of corrosive liquids



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



## MACHINE PREPARATION

### 9. RECHARGING THE BATTERIES (VERSION WITH BUILT-IN BATTERY CHARGER) (B-BT versions)

**ATTENTION:** Please read carefully the use and maintenance instructions of the battery charger that is included with the machine.

To charge the batteries you must:

1. Turn the key of the master switch anticlockwise to the "OFF" position (1).
2. Engage the parking brake (2) located on the left side of the machine.
3. Make sure that the recovery tank is empty
4. Disconnect the hinges on the upper part of the handlebars.
5. Turn the recovery tank anticlockwise as far as it will go
6. Remove the power outlet protection (3).
7. Connect the battery charger power cable.
8. Wait for the green LED of the battery charger to light.
9. Disconnect the battery charger power cable.
10. Insert the power outlet protection.

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

**ATTENTION:** 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

**ATTENTION:** never leave the batteries completely discharged, even if the machine is not being used

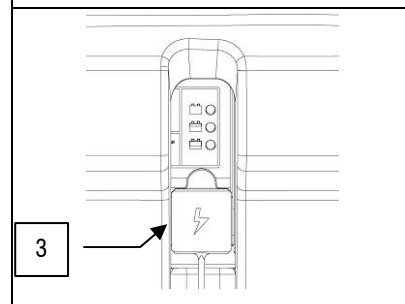
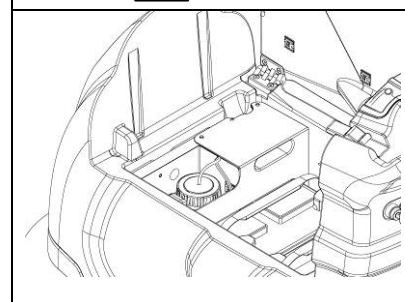
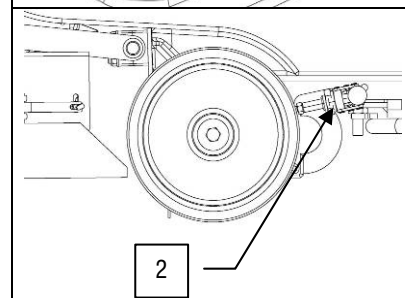
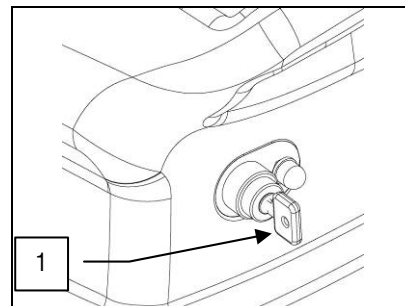
**ATTENTION:** for the daily recharging of the batteries, you must fully respect the indications provided by the manufacturer or retailer. All installation and maintenance operations must be carried out by expert personnel, trained at the COMAC assistance centre

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



**ATTENTION:** danger of exhalation of gas and leakage of corrosive liquids

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

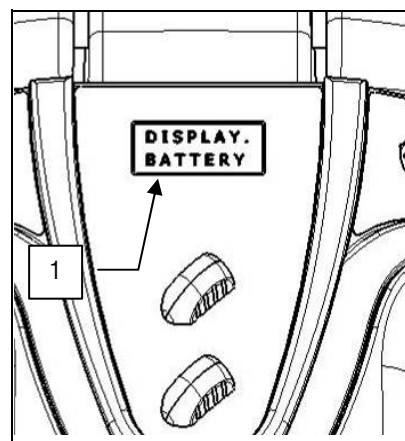


### 10. BATTERY INDICATOR (B-BT versions)

On the instrument panel of the machine there is a monitor (1) indicating (amongst other things) the battery charge status. If the upper line contains 8 light indicators, the battery charge level is 100%. If the edges of the indicators are flashing, this means the batteries are run down.



**ATTENTION:** a few seconds after the last indicator on the monitor has flashed, the brush motor will automatically switch off. With the remaining charge it is possible to complete the drying process before recharging



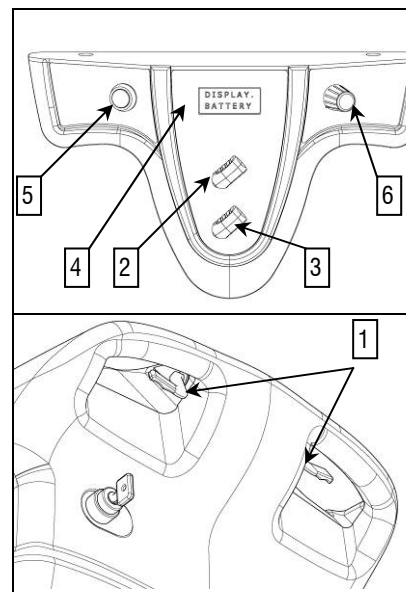


## MACHINE PREPARATION

### 11. INSTRUMENT PANEL COMPONENTS

The instrument panel components are identified as follows:

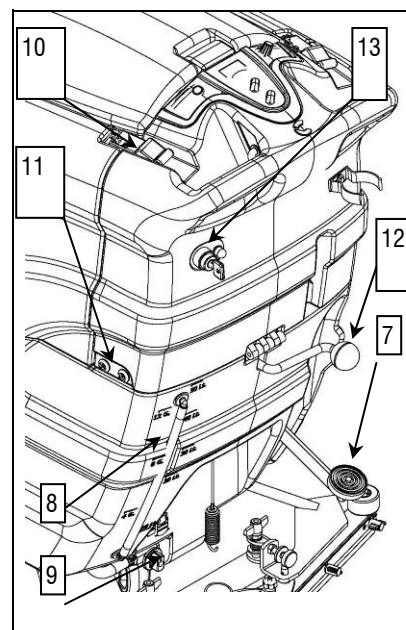
1. Levers to activate brushes/traction (located beneath the grip)
2. Water outlet regulation switch (DS versions)
3. Detergent outlet regulation switch (DS versions)
4. Battery level / hour-counter display
5. Battery level hour-counter display command button
6. Speed level key (BT versions)



### 12. REAR COMPONENTS

The rear components are identified as follows:

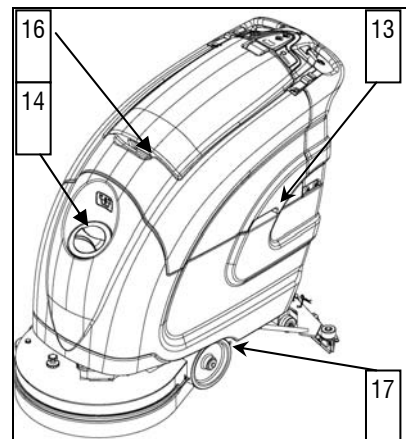
7. Brush lifting pedal
8. Water/solution level tube
9. Water tap
10. Tank closure hinges
11. Handlebar fastening screws
12. Squeegee lifting lever
13. Key operated switch



### 13. FRONT AND SIDE COMPONENTS

The side components are identified as follows:

14. Water/solution inlet cap
15. Recovery tank lifting handle
16. Suction unit lifting handle
17. Parking brake lever





## MACHINE PREPARATION

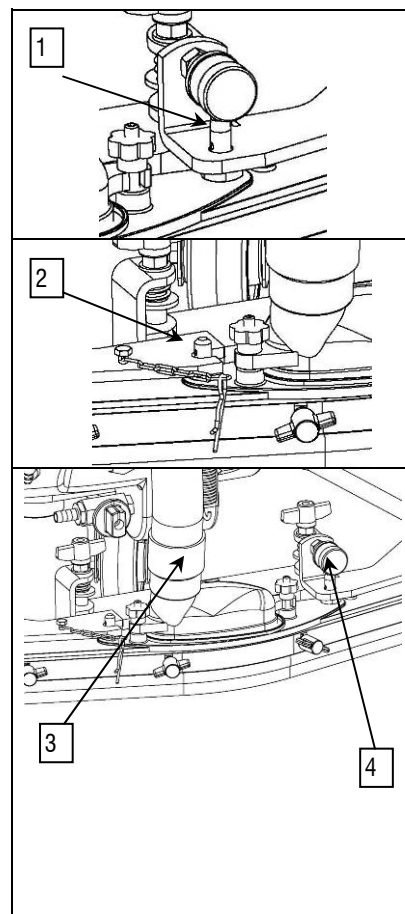
### 14. ASSEMBLING THE SQUEEGEE

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. Turn the key of the master switch anticlockwise to the "OFF" position.
2. Engage the parking brake located on the left side of the machine.
3. Lift the squeegee connection by means of the lever at the rear of the machine.
4. Lift the squeegee and fit the right stud (1) in the hole in the squeegee connection.
5. Secure the stud by means of the pin on the squeegee connection.
6. Lift the squeegee and fit the left stud (2) in the slot on the squeegee connection.
7. Secure the stud by means of the pin on the squeegee connection.
8. Insert the suction tube (3) in the appropriate sleeve on the squeegee, ensuring that the suction tube lies to the right of the lifting cable.

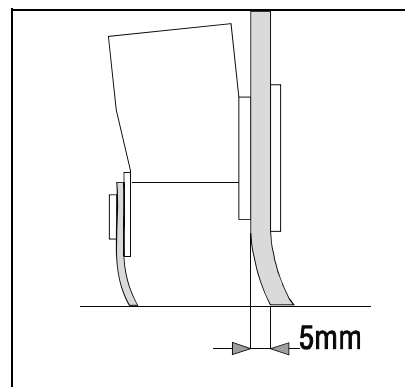


**ATTENTION:** these operations must be carried out using protective gloves to avoid any possible contact with the edges or tips of metal objects



### 15. ADJUSTING THE SQUEEGEE INCLINATION

During working operation, the rear rubber is tilted slightly backwards (by about 5 mm) 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 (4) anticlockwise. To increase the bend of the rubber at the sides of the squeegee, rotate the set screw clockwise.

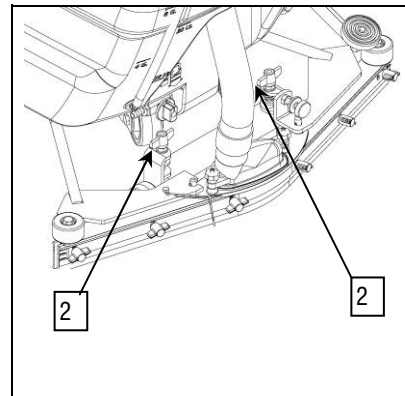




#### 16. ADJUSTING THE SQUEEGEE HEIGHT

The height of the squeegee must be adjusted on the basis of the state of wear and tear of the rubber. To do this, turn the knob (1) anticlockwise to raise the squeegee, and clockwise to lower it.

**Note:** the right and left wheels must be adjusted to the same level, so the squeegee can work parallel to the floor.

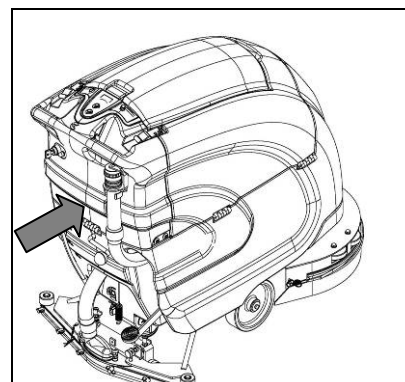


#### 17. RECOVERY TANK

Check the cap of the drainage tube (on the rear of the machine) is correctly closed.



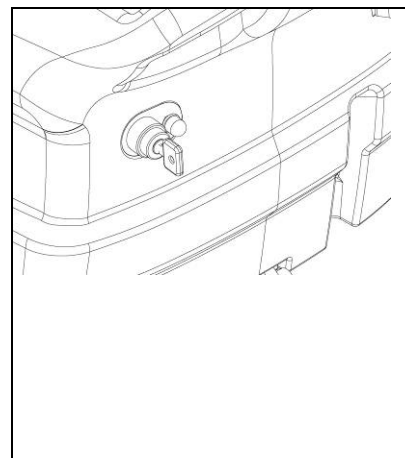
**ATTENTION:** To avoid foam production, put a minimum quantity of antifoam liquid in the recovery tank before starting to clean



#### 18. SOLUTION TANK / DETERGENT SOLUTION (VERSIONS WITHOUT DS)

Proceed as follows to fill the solution tank:

1. Turn the key of the master switch anticlockwise to the "OFF" position.
2. Engage the parking brake.
3. Remove the front inlet cap and check the solution filter (1) is correctly assembled.
4. Check the filter cover (2) beneath the solution tank is correctly closed.
5. Fill it with clean water at a temperature not exceeding 50°C. You can check the quantity in the tank by means of the rear tube (3).





## MACHINE PREPARATION

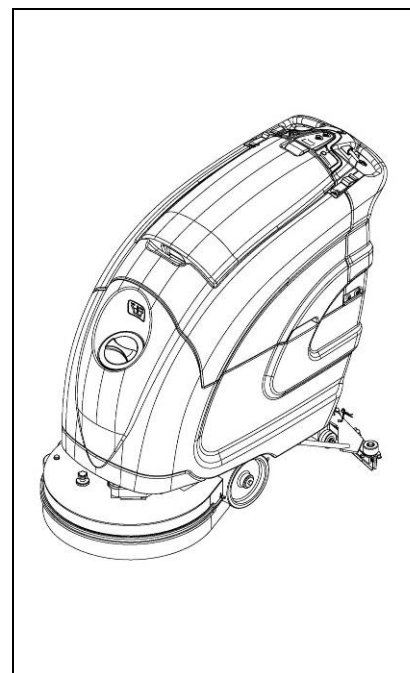
The solution tank has a maximum capacity of about 48 litres. Add the liquid detergent to the tank in the concentration and manner indicated on the detergent manufacturer's label. The formation of excess foam could damage the suction motor, so use only the minimum amount of detergent necessary.



**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. In addition, you are advised to always use low foam detergents. Do not use pure acids.



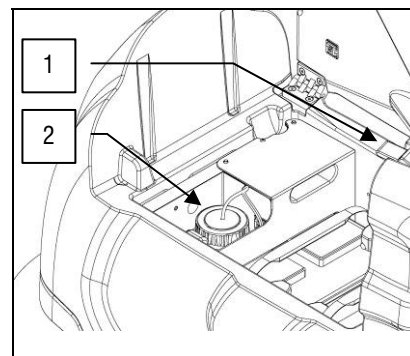
**ATTENTION:** Protective gloves should always be worn before handling detergents or acidic or alkaline solutions to avoid serious injury to hands.



### 19. SOLUTION TANK WITH AUTOMATIC CDS DISTRIBUTION SYSTEM

Proceed as follows to fill the solution tank:

1. Check that the key of the master switch is in the "OFF" position.
2. Engage the parking brake, by means of the lever on the left side of the machine.
3. Check the recovery tank is empty before you open it.
4. release the hinges (1) on the handlebars
5. Rotate the recovery tank as far as it will go.
6. Unscrew the cap (2) of the canister in the compartment (in front of the batteries) and fill it with liquid detergent in the manner indicated on the label supplied with the machine. Check the screw cap is well closed, to avoid any liquid leaking out while the machine is being used.

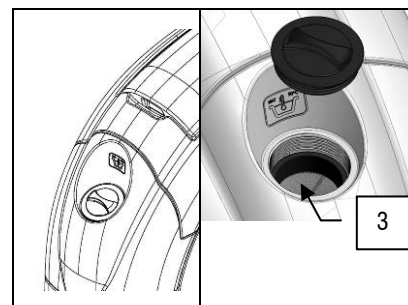




## MACHINE PREPARATION

7. Close the recovery tank, rotating it by hand. Hold the recovery tank by the handle only to avoid crushing your hands.
8. Loosen the front cap of the solution tank.
9. Check that the filter cover (3) beneath the solution tank is correctly closed.
10. Fill it with clean water at a temperature not exceeding 50°C. The tank has a maximum capacity of about 48 litres.

To regulate the water/detergent mixture, carefully read the “REGULATING THE DETERGENT WITH THE CDS SYSTEM” paragraph.



**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. In addition, you are advised to always use low foam detergents. Do not use pure acids or detergents with a stronger gradation than that indicated on the label supplied.



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

5 lt.	H <sub>2</sub> O 4 lt. + 1 lt.
Detergente standard Standard detergent	Detergente concentrato Concentrated detergent
0,5%	0,1%
1%	0,2%
1,5%	0,3%
2%	0,4%
2,5%	0,5%
3%	0,6%
3,5%	0,7%

**MODALITÀ D'USO:**  
Inserire la tanica o versare direttamente il detergente nella tanica da 5 litri in dotazione.  
Selezionare, tramite il selettore sul cruscotto, la % diluizione detergente desiderata tra i valori indicati nella tabella.

**INSTRUCTIONS:**  
Insert the can or pour directly the detergent into the 5 liter can.  
Select with the knob on the instrument panel the dilution % you need among the values indicated in the table.

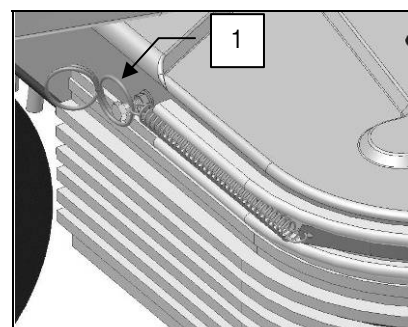
**MODALITÀ D'USO:**  
Versare 1 litro di detergente concentrato e riempire completamente di acqua la tanica da 5 litri in dotazione.  
Selezionare, tramite il selettore sul cruscotto, la % diluizione detergente desiderata tra i valori indicati nella tabella.

**INSTRUCTIONS:**  
Pour 1 liter concentrated detergent and fill completely the equipped 5 liter can with water.  
Select with the knob on the instrument panel the dilution % you need among the values indicated in the table.

### 20. ASSEMBLING THE SPLASHGUARD RUBBERS.

For packaging reasons, the splash guard rubbers are supplied disassembled from the machine. To connect the rubber, remove the rubber-pressing blades and unthread the spring hook (1) from the connection screw. Wind the rubber all around the base, inserting the base fixing screw in the central hole. Reattach the blades, starting from the centre of the base.

Be careful not to invert the right blade with the left one, as they are not the same.





## MACHINE PREPARATION

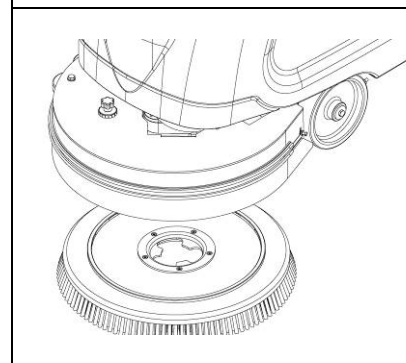
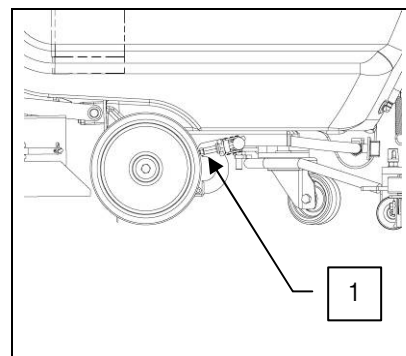
### 21. ASSEMBLING THE BRUSH (ABILA 2010 17-20 BASES)

1. Use the parking brake handle (1) to stop the machine.
2. Raise the base by means of the appropriate pedal.
3. Turn the key of the master switch anticlockwise to the "OFF" position.
4. With the base in a raised position, place the brush under the seat of the base plate.
5. Lower the base with the appropriate pedal.
6. Turn the key of the master switch clockwise to the "ON" position.
7. Instantly engage and release the brush-traction control lever



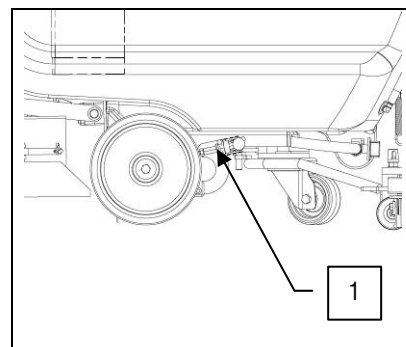
**WARNING!** During this operation, check there are no people or objects near the brushes

**ATTENTION:** this operation must be carried out wearing gloves to protect your hands

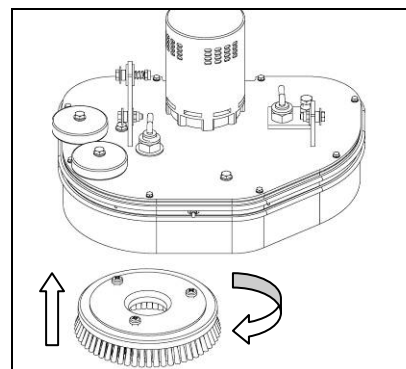


### 22. ASSEMBLING THE BRUSH (BASES ABILA 2010 42-52)

1. Use the parking brake handle (1) to stop the machine.
2. Raise the base by means of the appropriate pedal.
3. Turn the key of the master switch anticlockwise to the "OFF" position.



4. With the base up, place the brushes into the plate housing beneath the base, turning the brushes until the three pins enter the niches in the plate itself; rotate until the button is pushed towards the coupling spring and is locked into place. The figure shows the rotation direction for coupling the right-hand brush; for the left-hand one, rotate in the opposite direction.





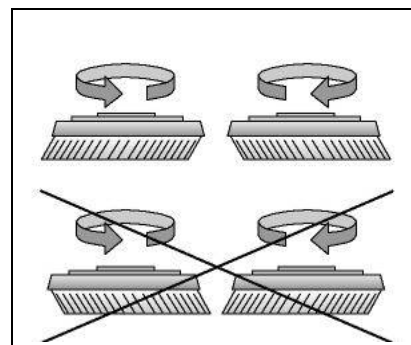
## MACHINE PREPARATION

You are advised to invert the right and left-hand brushes every day. If the brushes are not new however, and have deformed bristles, it is better to reassemble them in the same position (the right-hand one on the right, and the left-hand one on the left), to prevent the different inclination of the bristles producing an overload on the brush motor as well as excessive vibrations.



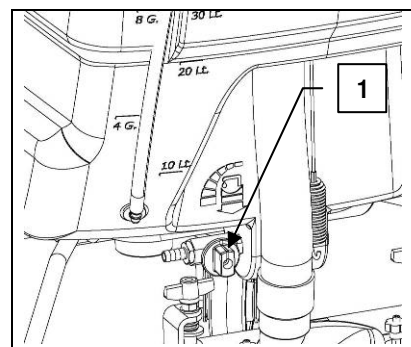
**WARNING!** During this operation, check there are no people or objects near the brushes

**ATTENTION:** this operation must be carried out wearing gloves to protect your hands



### 23. REGULATING THE SOLUTION FOR VERSIONS WITHOUT DS

Adjust the amount of outlet water through the anticlockwise rotation of the lever (1) on the tap, located on the rear of the machine.



### 24. DETERGENT REGULATION WITH THE DS SYSTEM

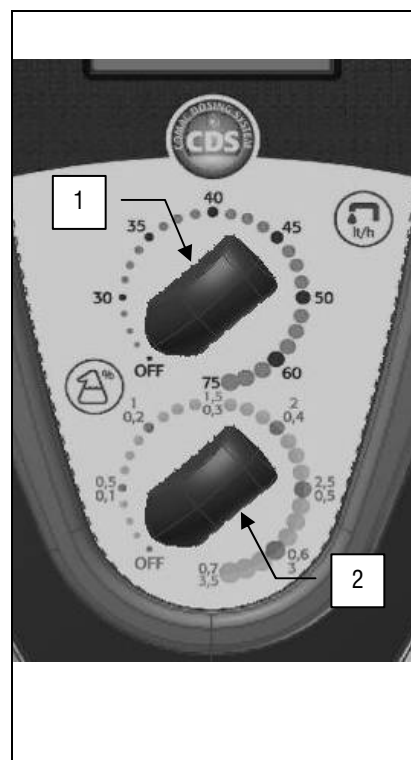
Perform the following adjustments on machine versions with the CDS:

1. Regulate the flow of detergent solution to the brushes by rotating the upper knob (1) clockwise. The quantity of solution varies from a minimum of 30 litres/hour to a maximum of 75 litres/hour, with 7 set dosing points. The right solution flow should be proportional to the degree of dirt on the floor. In addition, remember that the time available for continuous working depends on the quantity of water in the tank: For example, the work autonomy with a full tank (about 48 litres) and the selector (1) set at 30, is about 1.5 hours.
2. Regulate the percentage of liquid detergent in the solution by rotating the lower knob (2) clockwise. The lower value is equal to 0.5% (for standard detergents) or 0.1% (for a concentrated detergent, diluted as indicated on the label supplied with the machine), while the higher value is equal to 3.5% or 0.7%, with 7 set points. Use high detergent percentages to remove very greasy dirt from the floor.

To avoid any tampering with the set regulation, you can remove the two switches and cover the two holes with the plastic caps supplied with the machine.



**WARNING!** Check that the tap lever is fully opened, the lever is positioned at the rear of the machine.

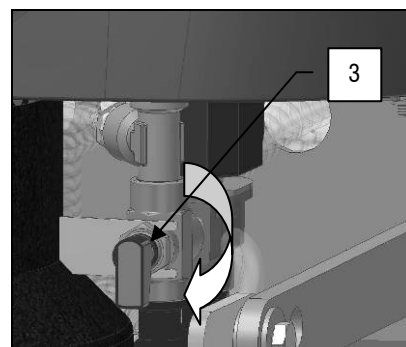




ATTENTION: if the CDS system does not work, or you want to clean without using this device, you can intervene on the tap (3) on the brush base near the motor, rotating the lever by 180° as shown in the figure. Rotate the knobs (1) and (2) anticlockwise, to "OFF".

ATTENTION: before regulating the solution, check there is detergent in the inner can, and that the side water tap is turned on.

To resolve any malfunctioning of the CDS system, contact the COMAC assistance centre.



## 25. POTENTIOMETER REGULATION VERSION WITH BT

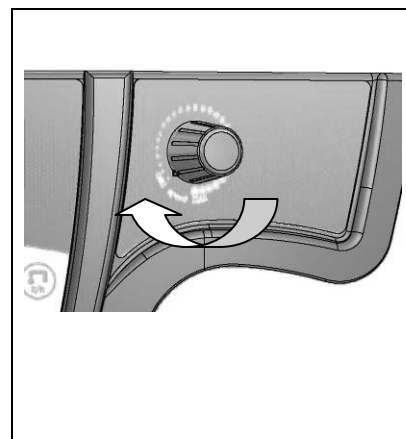
Perform the following adjustments on machine versions with the CDS:

1. Check that the potentiometer knob is placed on minimum.
2. Turn the key operated master switch to "ON".
3. Engage the "man present" levers on the handlebars, so the machine starts to move.
4. Adjust the desired forward speed by turning the knob gradually clockwise.



**WARNING!** The reverse speed was reduced compared to that of forward speed in order to comply with existing safety at work standards.

If the potentiometer is adjusted while reversing, the adjustment of the forward speed will be automatically changed.





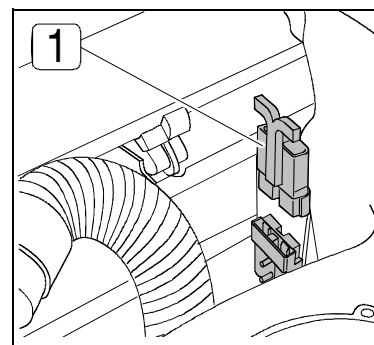
## WORK

### 1. PREPARING TO WORK

1. Connect the connector (1) to the batteries (versions without a built-in battery charger), insert the machine plug into the mains socket for the electric versions.



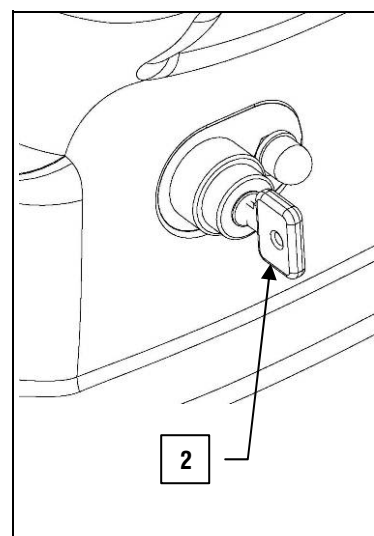
**ATTENTION:** before using the machine, the operators must be suitable trained. We therefore suggest you read this instruction booklet carefully and read it again whenever difficulties arise while using the machine



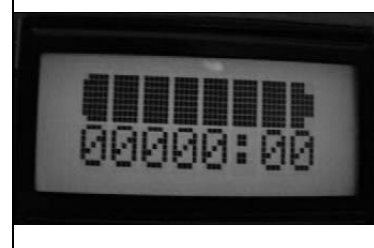
2. Rotate the key of the master switch (2) to the "ON" position (clockwise). The monitor display on the instrument panel will immediately come on.



**ATTENTION:** if the machine is used in places where there is a risk of falling objects, the operator must be provided with all the appropriate protection devices as laid out in the legal requirements



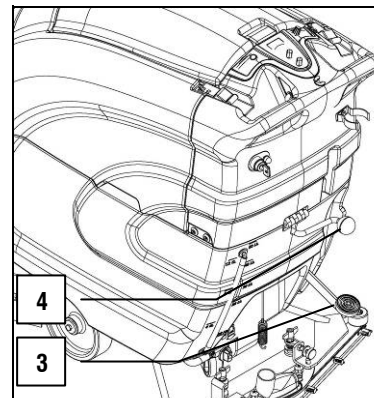
3. With switch-on, three consecutive screens are visualised on the monitor. The first screen shows (on the top line) what type of hour-counter has been set; in this case it's a total hour-counter (to visualise a different type - for instance partial - contact the qualified, COMAC-trained personnel). The bottom line shows the "service" setting (in this case there is no setting).
4. The second screen visualises what battery technology (or mains supply) has been set for machine operation. In this example, it's lead batteries (to set another type of battery - for instance gel - contact the qualified, COMAC-trained personnel).
5. The third and last screen (known as "work") visualises the battery charge status (if it's a battery supplied machine) and the total functioning time. When the batteries supplied are fully charged, the upper line contains 8 light indicators that represent a battery. As the batteries gradually run down, the indicators go out and, with the batteries completely run down, only the battery outline flashes. The bottom line indicates the hours and minutes of functioning. The flashing ":" symbol indicates that the hour-counter is counting the machine functioning time.



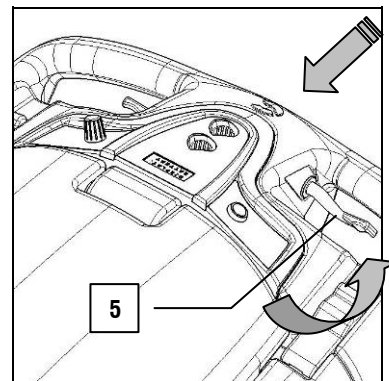


## WORK

6. Release the lever (3) and lower the base.
7. Lower the squeegee, turning the lever (4) anticlockwise. The suction motor will start when fully lowered. At the end of the work, turn the key to the "OFF" position to switch off the suction motor
8. Check the parking brake is disengaged.



9. In the versions with assisted traction, by pressing the "man present" levers (5), the brushes are activated and the machine begins to move. During the first metres, check there is sufficient solution and that the squeegee dries perfectly.
10. The machine will now begin to work with full efficiency until the battery is flat or until the cleaning solution has finished.

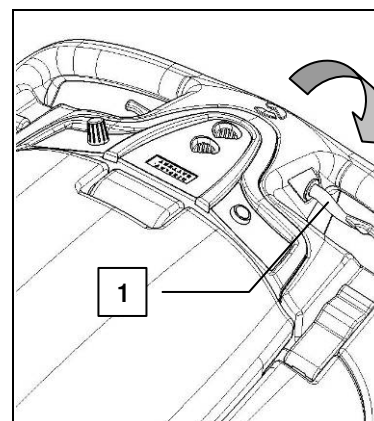


### 2. REVERSE OPERATION VERSIONS WITH ASSISTED TRACTION

To activate the reverse direction, just push the command levers (1) downwards. With the base lowered, the brushes go on turning but the solution supply is interrupted.



**ATTENTION:** when making even brief reverse movements, check the squeegee is raised. For long stops, raise the base to avoid ruining the brushes



### 3. RECOVERY TANK OVERFLOW DEVICE

The machine is equipped with a float which intervenes when the recovery tank is full, which will make the suction motor sound deeper.

In this case the recovery tank must be emptied.

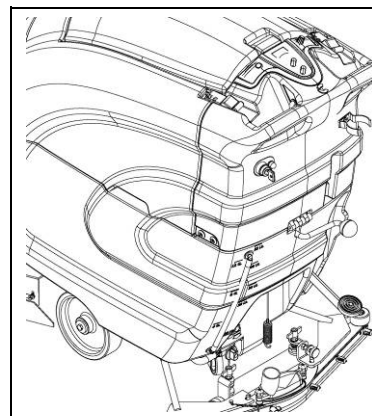


## AT THE END OF THE WORK

### 1. AT THE END OF THE WORK

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

1. Turn the key of the master switch to the "OFF" position and then immediately to the "ON" position, this will disable the suction motor.
2. Raise the squeegee by turning the lever at the rear of the machine clockwise.
3. Raise the base by levering the appropriate pedal with the foot.
4. Take the machine in an area designated for the disposal of liquids.
5. Turn the key of the master switch to the "OFF" position, and remove the key, for the electric versions disconnect the plug from the mains socket.
6. Engage the parking brake, by means of the lever on the side of the machine.
7. Disconnect the pipe from its hook, unscrew the discharge plug and empty the recovery tank.

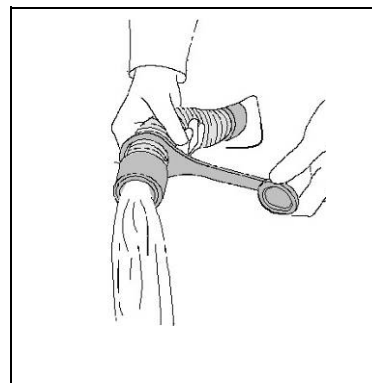


To simplify the draining operation, you are advised to keep the tube bent with one hand and, with the other, unscrew the knob and remove the plug. Slowly straighten the tube and the liquid will start draining at the desired speed.



**ATTENTION:** This operation must be carried out using gloves to protect against contact with dangerous solutions

8. disassemble the brushes and clean them with a jet of water (to disassemble the brushes, see "DISASSEMBLING THE BRUSHES" below)



9. At the end of the work, park the machine in a closed place.
10. Engage the parking brake.

Do not leave the squeegee and brush base resting on the floor for a long time.



**ATTENTION:** do not leave the machine unattended without first removing the start-up switch key and applying the parking brake. In addition, do not park the machine in open places or on sloping floors



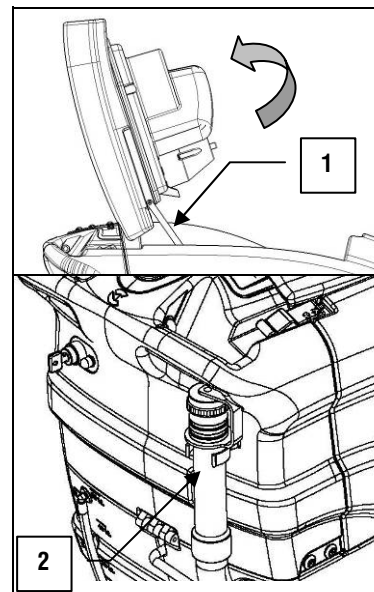
## DAILY MAINTENANCE

### 1. CLEANING THE RECOVERY TANK

1. Take the machine in an area designated for the disposal of liquids.
2. Check that the parking brake is engaged.
3. Raise the suction cover and keep it still using the lifting rod (1) at the side.
4. Turn the key of the master switch to the "OFF" position, and remove the key, for the electric versions disconnect the plug from the mains socket.
5. Remove the drainage tube (2) from its seat.
6. Release the cap.
7. Rinse the inside of the tank well with a jet of water.
8. Reposition the cover on the machine and replace the drainage hose cap.



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

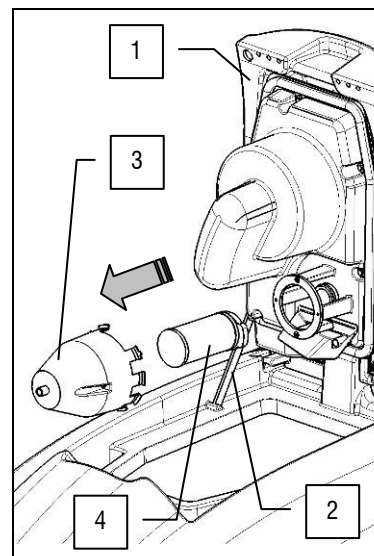


### 2. CLEANING THE SUCTION FILTER

1. Raise the cover (1), blocking its movement with the retainer (2)
2. Check that the parking brake is engaged.
3. Remove the suction filter protection (3) by rotating it clockwise
4. Remove the suction filter (4) from its seat
5. Use a jet of water to clean the walls and base of the filter.
6. Reassemble all the elements.



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

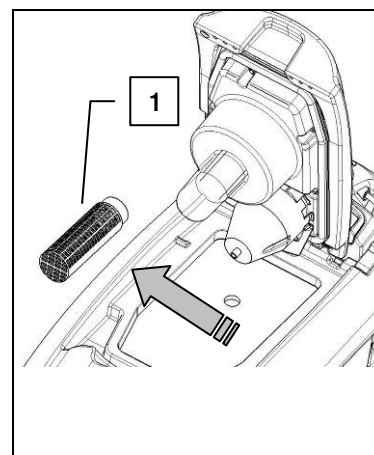


### 3. CLEANING THE SUCTION TUBE FILTER

1. Raise the suction cover and block it as indicated in the previous paragraph
2. Check that the parking brake is engaged.
3. Rotate the inner filter (1) and remove it
4. Carry out the cleaning operations carefully.
5. Reassemble all the elements.



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





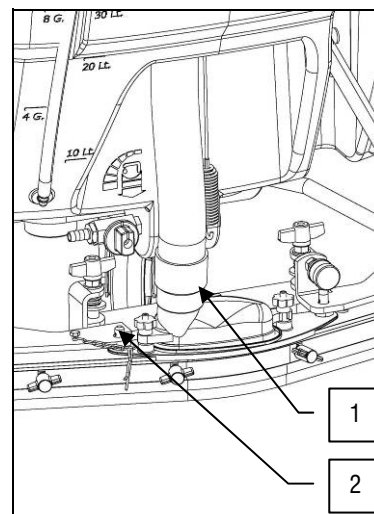
## DAILY MAINTENANCE

### 4. DISASSEMBLING AND CLEANING THE SQUEEGEE

Check the squeegee is always clean, for better drying results.

To clean it you must:

1. Raise the squeegee body by turning the lever anticlockwise.
2. Check that the parking brake is engaged.
3. Remove the suction tube (1) from the squeegee
4. Remove the pins (2) on the squeegee connection to release the stud from its seat.
5. Pull the squeegee downwards until the right-hand stud is released from its seat
6. Clean the inside of the squeegee and opening with water, remove any impurities that prevent correct suction.
7. Carefully clean the squeegee rubbers
8. Reassemble all the elements.

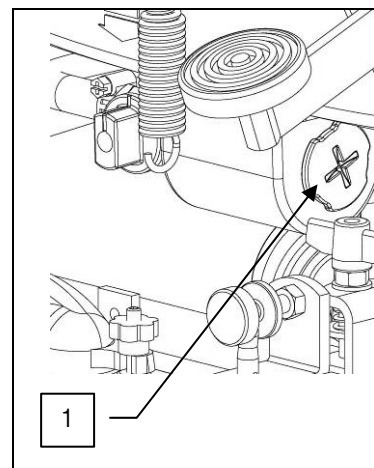


### 5. CLEANING THE CLEAN WATER FILTER

1. Turn the key of the master switch to the anticlockwise to the "OFF" position, and remove the key, for the electric versions disconnect the plug from the mains socket.
2. Check that the parking brake is engaged.
3. Make sure that the solution tank is empty
4. Unscrew the filter cap (1)
5. Rinse the filter cartridge with running water.
6. Reassemble all the elements.



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

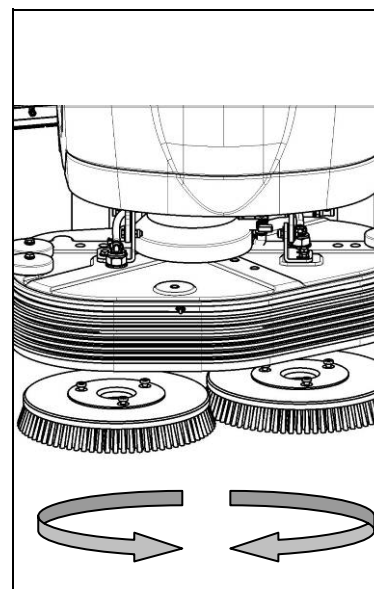


### 2. DISASSEMBLING THE BRUSH

1. Turn the key of the master switch to the anticlockwise to the "OFF" position, and remove the key, for the electric versions disconnect the plug from the mains socket.
2. Check that the parking brake is engaged.
3. Raise the base, using the lever
4. With the base up, rotate the brush until it comes out of the brush-holder plate seat, as shown in the figure. The drawing shows the rotation direction to release the brush of duel-brush bases, the rotation direction for single-brush bases is anticlockwise.
5. Always check the bristles for signs of wear. You are advised to replace the brushes when the bristles are less than 15mm long



**ATTENTION:** this operation must be carried out using gloves to protect against contact with dangerous solutions





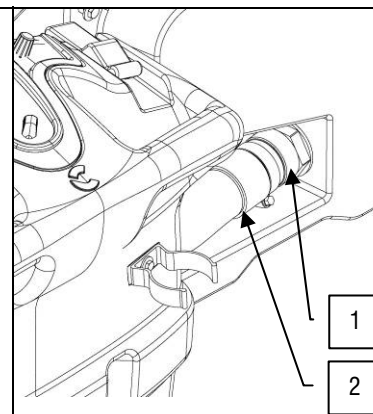
## WEEKLY MAINTENANCE

### 1. CLEANING THE SQUEEGEE TUBE

Every week, or whenever suction seems to be unsatisfactory, check the squeegee tube is not obstructed.

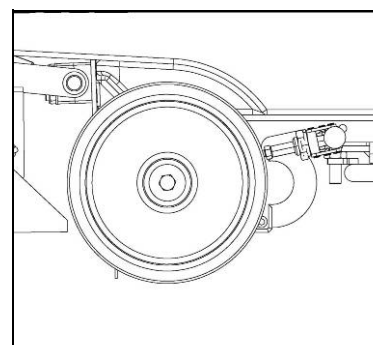
To clean it, proceed as follows:

1. Remove the tube from the sleeve on the squeegee
2. Release the hinges on the upper part of the machine.
3. Open the recovery tank
4. Remove the other end of the tube (2) from the hose connector (1) of the recovery tank
5. Wash the inside of the tube with running water to remove any impurities that prevent proper suction
6. Reassemble all the elements.



### 2. CHECKING THE WHEEL BRAKE

Every week, check the distance between the work brake pads and the wheels. If necessary, adjust them by means of the nuts, so they are at a distance of 3mm when homed.

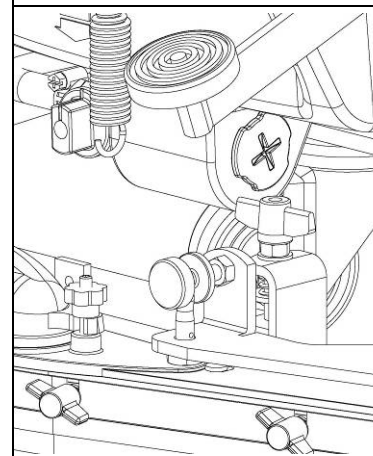


### 3. CLEANING THE SOLUTION TANK

1. Engage the parking brake.
2. Loosen the front cap of the solution tank.
3. Remove the clean water filter.
4. Unscrew the filter cap at the rear of the machine.
5. Rinse the inside of the tank with a jet of water
6. Insert the cap and the filter at the front of the tank and screw the cap on the rear of the machine.



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





## TROUBLESHOOTING

### 1. REPLACING THE SQUEEGEE RUBBERS

Check the state of wear and tear of the squeegee rubbers and, if necessary, replace them.

The rear rubber (1) should be replaced when the squeegee fails to pick up well, leaving water on the floor. To replace the rubber, you must:

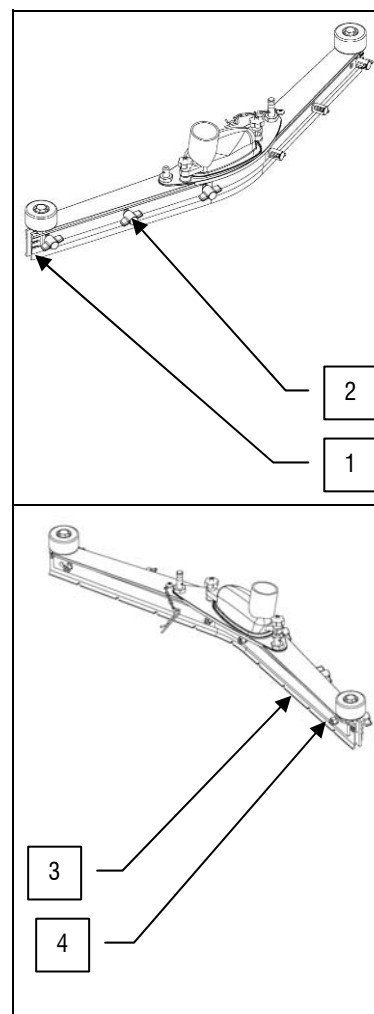
1. loosen the wing nuts (2) that block the rear rubber-pressing blade and the strengthening profile
2. unthread the rear rubber and replace it (if the rear rubber isn't yet worn, rotate it by 180° and reassemble it so the contact surface is still in good condition)
3. reassemble the rear rubber, the strengthening profile and the rubber-pressing blade, then tighten the wing nuts

The front rubber (3) should be replaced when the squeegee does not rest evenly on the floor and does not generate a closed suction chamber (letting a lot of air enter from the front). To replace the rubber, you must:

4. disassemble the squeegee from its support (see the "DISASSEMBLING AND CLEANING THE SQUEEGEE" paragraph)
5. loosen the threaded nuts (4) that block the front rubber-pressing blade
6. unthread the front rubber (3) and replace it
7. reassemble the front rubber (3) and the rubber-pressing blade, then tighten the threaded nuts (4)



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



### 2. INSUFFICIENT WATER ON THE BRUSH

1. Check the tap beneath the symbol (1) is turned on.
2. Check there is water in the solution tank.



### 3. THE MACHINE DOES NOT CLEAN WELL

1. Check the state of wear and tear of the brush and, if necessary, replace it (the brush must be replaced when the bristles are about 15 mm long).
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").

### 4. THE SQUEEGEE DOES NOT DRY PERFECTLY

1. Check the squeegee rubbers are clean.
2. Adjust the inclination and height of the squeegee (see the "ADJUSTING THE SQUEEGEE INCLINATION AND HEIGHT" paragraph).
3. Check the suction tube is correctly inserted in its housing on the recovery tank.
4. Check the inner filter of the recovery tank is not dirty and, if necessary, clean it thoroughly.

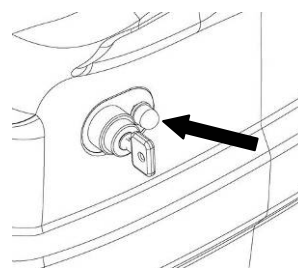
### 5. EXCESSIVE FOAM PRODUCTION

Check 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.

### 6. ELECTRIC SYSTEM SAFETY (E versions)

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 over-large 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.º	Code	Type of bristles	Ø Bristles	Ø Brush	Length	Notes
Abila 2010 45 B-BT	1	405644	PPL	0.3	420	-	LIGHT BLUE
		405659		0.45			
		405645		0.6			WHITE
		405653		0.7			WHITE
		405646		1			BLACK
		405657	ABRASIVE				
Abila 2010 50 B-BT	1	427602	PPL	0.6	508	-	WHITE
		427605		0.3			LIGHT BLUE
		427604		0.9			BLACK
		427708	ABRASIVE				
Abila 2010 42 B-BT	2	405580	NYLON	0.8	210	-	WHITE
		405578	PPL	0.3			LIGHT BLUE
		405579		0.5			WHITE
		405581	ABRASIVE				
Abila 2010 52 B-BT	2	405601	PPL	0.3	255	-	BLUE
		405604		0.5			GREEN
		405602		0.9			BLACK
		405603	ABRASIVE				
Abila 2010 45E	1	405644	PPL	0.3	420	-	LIGHT BLUE
		405659		0.45			
		405645		0.6			WHITE
		405653		0.7			WHITE
		405646		1			BLACK
		405657	ABRASIVE				
Abila 2010 50E	1	427606	PPL	0.3	508	-	BLUE
		427602		0.6			WHITE
		427604		0.9			BLACK
		427708	ABRASIVE				

PAD HOLDER SELECTION TABLE

Machine	No.	Code	Description	Ø Pad	Height	Center	Notes
Abila 2010 45B-BT	1	405529	PAD HOLDER D=420 H=40	420	40		
		405530	PAD HOLDER D=420 H=60		62		
Abila 2010 50B-BT	1	405542	PAD HOLDER D=500	500	61		
Abila 2010 42B-BT	2	405510	PAD HOLDER D=210	200	24		
		405531	PAD HOLDER D=200		-		
Abila 2010 52B-BT	2	405513	PAD HOLDER D=255	255	-		
Abila 2010 45E	1	405540	PAD HOLDER D=430	430	57		
Abila 2010 50E	1	405542	PAD HOLDER D=500	500	61		



## EC DECLARATION OF CONFORMITY

The undersigned company:

**COMAC S.p.A.**

Via Ca' Nova Zampieri no. 5

37057 San Giovanni Lupatoto (VR), Italy

declares under its sole responsibility that the

**SCRUBBING MACHINE**

**mod. ABILA 42B - 42BT - 52B - 52BT - 45B - 45BT - 50B - 50BT**

comply with the requirements of the following Directives:

- 2004/108/EC: Electromagnetic Compatibility Directive and subsequent modifications.
- 2006/42/EC: Machinery Directive

They also comply with the following standards:

- EN 60335-1: Household and similar electrical appliances - Safety. Part 1: Generic standards
- 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: Safety of Machinery - Basic concepts, general principles for design - Part 1: Basic terminology and methodology
- EN 12100-2: Safety of Machinery - Basic concepts, general principles for 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 55022: Devices for information technology – Radio interference characteristics – Limits and measurement methods.
- 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 62233: Household and similar electrical appliances - Electromagnetic fields Methods for evaluation and measurement

San Giovanni Lupatoto, 11/01/2010

COMAC S.p.A.  
Legal representative  
Giancarlo Ruffo

**COMAC spa**

Via Cà Nova Zampieri, 5 – 37057 San Giovanni Lupatoto – Verona – ITALY

Tel. +39 045 8774222 – Fax +39 045 8750303 – E-mail: [com@comac.it](mailto:com@comac.it) or [info@comac.it](mailto:info@comac.it) - [www.comac.it](http://www.comac.it)



## EC DECLARATION OF CONFORMITY

The undersigned company:

**COMAC S.p.A.**

Via Ca' Nova Zampieri no. 5

37057 San Giovanni Lupatoto (VR), Italy

declares under its sole responsibility that the

**SCRUBBING MACHINE**  
**mod. ABILA 45E – 50E**

comply with the requirements of the following Directives:

- 2004/108/EC: Electromagnetic Compatibility Directive and subsequent modifications.
- 2006/95/EC: Low Voltage Directive
- 2006/42/EC: Machinery Directive

They also comply with the following standards:

- EN 60335-1: Household and similar electrical appliances - Safety. Part 1: Generic standards
- 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 12100-1: Safety of Machinery - Basic concepts, general principles for design - Part 1: Basic terminology and methodology
- EN 12100-2: Safety of Machinery - Basic concepts, general principles for 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.
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- EN 61000-6-3: Electromagnetic compatibility (EMC) - Part 6-3: Generic standards — Standard emission for residential, commercial and light-industrial environments.
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San Giovanni Lupatoto, 11/01/2010

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