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Organizzazione con
Sistema di Gestione Certificato
ISO 9001 : 2008

ING. O. FIORENTINI S.p.A.
INDUSTRIAL CLEANING MACHINES

SCRUBBER MACHINE
MOD. ECOMINI 430

INSTRUCTIONS FOR USE AND MAINTENANCE

Rev.00

Congratulations on your choice!

*Thank you for having chosen to purchase a product by **FIORENTINI S.p.A.**, a world-leading manufacturer and distributor of industrial cleaning machines.*

Our long-standing experience and acquired know-how are the best guarantee of the technical quality of your purchase; all our products are built from top quality materials to ensure maximum reliability, sturdiness and functionality and to meet the requirements of even the most demanding customers. FIORENTINI was recently granted the quality system certificate to certify compliance with the requirements of UNI EN ISO 9001.

Feel free to contact us with any technical or commercial inquiry; we will be happy to supply any details and information that you may need.

CONTENTS

1. GENERAL INFORMATION

1.1. SYMBOLS USED

	*This symbol is used to alert the operator to important procedures or precautions to be followed in order to prevent damages to users or the machine*
	*This symbol is used to alert the operator to important general information.*

1.2. NOTES

*This manual is the property of **FIORENTINI S. p. A.***
The reproduction of all or part of this manual or its transmission to third parties by any mechanical or electronic system or otherwise is forbidden without a written authorisation by the manufacturer. This manual is supplied to the customers in a single original copy unless otherwise specified at the time of ordering.

This manual is supplied as an integral part of the machine and if the machine is transferred to a new owner, this manual should also be transferred. This manual should be stored at a safe location throughout the machine working life. The purchaser is responsible for making this manual available to all users. If this manual is lost, a duplicate should be obtained from FIORENTINI.

FIORENTINI S.p.a. will not be held responsible for any damages to persons and/or property resulting from failure to comply with the instructions in this manual.

FIORENTINI reserves the right to introduce any required technical and commercial changes without giving any notice. Therefore, any data and information contained in this manual may be changed and/or updated.

1.3. CONSULTING THE MANUAL

This manual deals exhaustively with all the issues considered necessary for an easy and safe use of the machine, in compliance with European Directives on product safety.

We therefore suggest to all authorised operators to carefully read this manual throughout and contact FIORENTINI in case of any doubt. This manual should also be used for reference whenever there are doubts concerning a procedure or operation to carry out or to train new operators.

In print, pictures and drawings can look slightly different from actual machine parts, without however being perceived as confusing.
Special symbols and **bold** and/or *Italic* fonts are used to highlight important information, particularly concerning safety.
The current revision code is indicated in the bottom left corner of every page.

1.4. WARRANTY

Warranty terms and conditions are stated here below unless otherwise specified in the order confirmation.

SCOPE OF THE WARRANTY

The machine has been designed and built for trouble-free use over several years. However, if any malfunctioning is observed during the warranty period, FIORENTINI undertakes to repair or replace free of charge any parts showing breaks and early wear due to faulty materials, working defects or incorrect assembly. The manufacturer warranty will not cover any parts whose early breaking or wear-and-tear are caused by:

- Failure to observe the instructions contained in this manual;
- Tampering or alterations introduced without Fiorentini's specific approval;
- Use of non-original spare parts;
- Wear parts for use as: brushes, blades, squeegee, etc.
- Use of equipment different from the recommended equipment.

For installed electrical parts and commercially available parts, FIORENTINI will extend to purchasers the same warranty terms granted to FIORENTINI itself by the parts' suppliers.

WARRANTY VALIDITY

The Ing.O.Fiorentini S.p.A. general terms conditions also apply to the warranty.
The manufacturer cannot be held responsible in any way for damages resulting from unauthorised modifications made to the appliance, from the use of unsuitable brushes and accessories and after use of the device other than that intended.

WARRANTY APPLICATION TERMS

Defective components must be returned to FIORENTINI in order to establish the causes of any observed defects and determine warranty applicability. Repairing and replacement under the warranty will be carried out on FIORENTINI's premises, by subcontractors or on the customer's premises. For work carried out on site, the customer will have to provide power sources, special equipment and auxiliary personnel and cover FIORENTINI personnel's travelling and accommodation expenses and meals.

PRODUCT RETURNS

In case of parts to be returned for replacement or repairs under the warranty, a written authorisation must be obtained in advance from FIORENTINI's Technical Assistance Department.
All defective parts must be carefully repacked in order to avoid damages during transport. Products must be returned on a free-on-board basis, complete with:

- Serial number read from the equipment ID plate (point 2.1);
- Item code and installation position of the returned parts, read from the spare part list (point 7.2);
- Detailed description of the observed defect and conditions under which it became apparent.

In case of defective electric or electronic components, please return the parts separately from other materials, so that waste containing dangerous substances can be separated and Waste Electrical and Electronic Equipment (WEEE) can be recycled according to the 2002/96/EC Directive.

Any parts acknowledged as being under the warranty will be returned on a free-on-board basis; replaced parts will remain the property of FIORENTINI.

EXCLUSIONS

The warranty will not cover materials and components exposed to normal wear and those whose working life cannot be established beforehand.

A missing machine data plate will imply the immediate loss of any warranty rights.

1.5. DECLARATION OF CONFORMITY

The Declaration of Conformity is supplied with the purchased machine and the use and maintenance manual.

DICHIARAZIONE CE DI CONFORMITA'-DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE-EG-KONFORMITÄTSERKLÄRUNG-
DECLARACION DE CONFORMIDAD
(ai sensi dell'allegato II 1.A della Direttiva **Macchine 2066/42/CE)**

La ING.O.FIORENTINI SPA

con sede in Via Piancaldoli 1896 Firenzuola, 50033, (FI)

DICHIARA/DECLARES/DECLARE/ERKLÄRT/ DECLARA

n qualità di costruttore sotto la propria responsabilità che la macchina
As manufacturer under its own responsibility that the machine
En tant que fabricant sous sa propre responsabilité que la machine
Als Hersteller, erklären, in alleiniger Verantwortung, dass das Produkt
Como fabricante, bajo su responsabilidad que la máquina

CE

Modello/model/modèle/Typ/modelo

Matricola/serial number/numero de série/
Fabriknummer/ Número matricula
Anno di costruzione /
Year of production/ Annee de production/
Baujahr/ Año de producción

a cui la presente dichiarazione si riferisce è conforme alle prescrizioni
which this declaration refers to, is in conformity with the requirements
à laquelle se réfère cette déclaration, est en conformité avec les prescriptions
Auf das sich diese Erklärung bezieht, mit der normativen übereinstimmt.
que esta declaración se refiere, está en conformidad con los requisitos

della direttiva macchine **2006/42/CE**/ *Directive* **2006/42/CE** / *de la Directive* **2006/42/CE** / *der EG-Richtlinie* **2006/42/EG** *über Maschinen / De la directiva maquinas* **2006/42/CE**

della direttiva compatibilità elettromagnetica **2014/30/EU**/ *the Electromagnetic Compatibility Directive* **2014/30** / **EU** / *de la Directive Compatibilité Electromagnétique* **2014/30** /**EU** / *elektromagnetische Verträglichkeit* **(EMV) 2014/30/EU** / la directiva de compatibilidad electromagnetica **2014/30/EU**

della direttiva sui rifiuti di apparecchiature elettriche ed elettroniche **(RAEE) 2012/19/UE**/ *Directive on Waste of Electrical and Electronic Equipment (***WEEE) 2012/19** / **EU**/ *de la directive relative aux déchets d'équipements électriques et électroniques (***DEEE) 2012/19** / **UE** / *Elektrische und elektronische Geräte Abfälle* **(DEEE)2012/19/UE** *Directiva sobre residuos de aparatos eléctricos y electrónicos* **(RAEE) 2012/19/UE**/
(ISCRIZIONE AL REGISTRO PRODUTTORI A.E.E.: N° IT12010000007391)

In particolare alle disposizioni normative
In particular, the regulatory rules
En particulier, les dispositions réglementaires
Gemäß den Bestimmungen der Richtlinie
En particular, las normas reguladoras

EN ISO 12100, EN ISO 13857, EN ISO 13850, EN 60204-1, EN 349, EN 953, EN ISO 4413, EN 60335, EN 60335-1, EN 60335-2-69, EN 60335-2-72, EN 55014-1, EN 55014-2, EN 62233, EN 61000-6-2, EN 61000-6-4

Il fascicolo tecnico è costituito da Ing.O.Fiorentini S.p.a. in qualità di persona giuridica- via Piancaldoli 1896 Firenzuola 50033 Fraz. Piancaldoli (FI) - Italia
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Ing. O. Fiorentini S.p.a.
Il Legale Rappresentante/president/gérant/ representante
Angelica Maria Cerutti

Piancaldoli
Luogo e data

Firma Cerutti Angelica Maria

2. MACHINE CHARACTERISTICS AND TECHNICAL DATA

2.1. MACHINE IDENTIFICATION

An adhesive machine identification label containing indelible “CE” marking details is affixed on the rear side of the machine next to the handle.

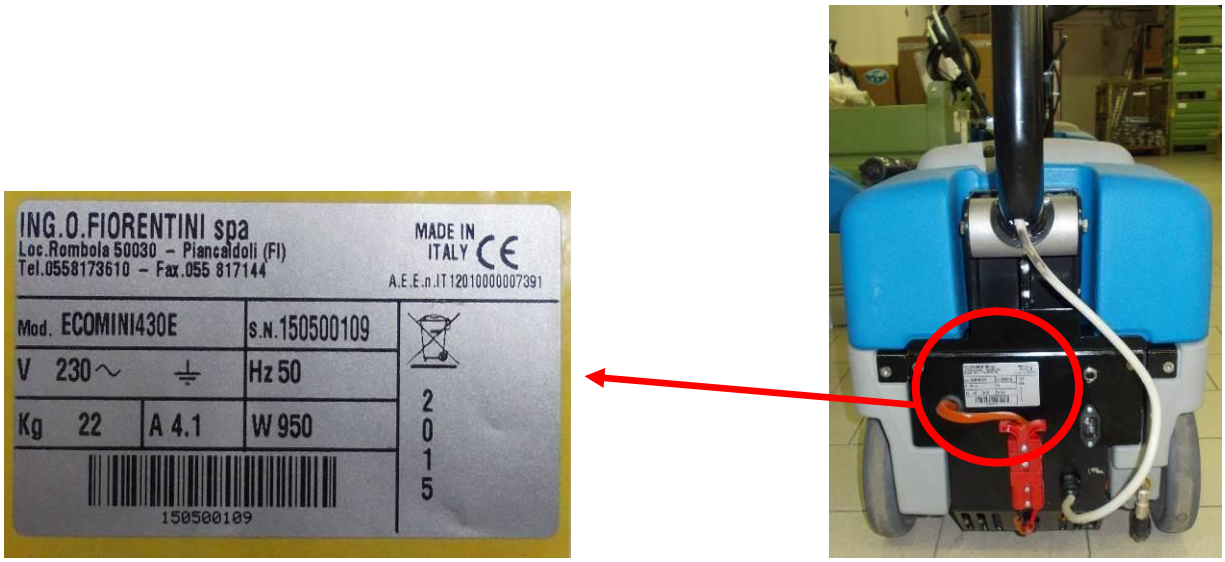


FIGURE N. 2.1

	The label must never be removed and should always be kept legible. If the label is damaged a duplicate should be ordered. The scrubber machine may not be sold without this label.

2.2. DESCRIPTION AND COMPONENTS

The scrubber machine ECOMINI 430 has been designed to clean flat surfaces by means of washing followed by washing water drying. The system is mains-powered via a 10 metres' long cable with a German power plug or a 4 12V x 18Ah battery pack, powering all the machine parts and electrical controls.
The machine is equipped with a rotating brush designed to scrub the floor with water and detergent. When the machine moves forwards, the squeegee or back brush, in contact with the floor, takes up any water by suction for its subsequent delivery to the recovery tank.

Through the control panel, all the main machine functions can be activated. In particular, it is possible to:

- Start the machine;
- View the battery charge state (battery powered version);
- Start vacuum suction;
- Start brush rotation (via a special lever on the handle);
- Adjust the handle angle (via a special lever provided on the handle);
- Lift/lower the squeegee.

The main components of the machine are:

- Washing fluid PPL plastic tank with draining hose;
- Washing effluent plastic PPL recovery tank with one suction hose and one draining hose;

- Set of batteries located in the solution tank compartment (battery-operated version);
- Power supply cable (electrically operated version);
- Scrubbing brush;
- Squeegee (floor wiping unit);
- Rear idle wheels;
- Adjustable angle handle

In consideration of recent EU concerns regarding product safety, FIORENTINI designed and built this machine in compliance with the safety and health requirements provided by applicable Directives. The high quality of the materials used, the applied advanced technology and FIORENTINI's long-standing experience are a guarantee of the performance and reliability of this machine. Each machine is submitted to rigorous testing during construction and to a thorough final test.

2.3. TECHNICAL DATA SHEET

SPECIFICATIONS

	ECOMINI 430 B/SR	ECOMINI 430 E
Input voltage	**24V**	**230V**
Batteries	**4x12V – 18Ah**	**-**
Scrubbing width	**430 mm**	
Squeegee width	**440 mm**	
Brushes	**1 x Ø 430 mm**	
Brush pressure	**33 kg**	**26 kg**
Max hourly output	**1720 sq.m/h**	
Max working range	**1,5 h**	
Solution tank capacity	**17 litres**	
Recovery tank capacity	**22 litres**	
Water lift	**130 mBar**	
Forward speed	**0-4 Km/h**	

ENGINE & MOTOR SPECIFICATIONS

Suction motor	**1x300 W / 24V**	**1x500 W / 230V**
Brush motor	**N°1x400W - 24V**	**N°1x370W - 230V**

DIMENSIONS AND WEIGHTS

Length	**700 mm**
Width	**500 mm**
Height	**570 mm**
Weight without load	**45 kg**
Battery weight	**4 x 5.5 Kg**
Drive	**Walk-behind operator**
Max. gradient at full load	**3 %**
Noise level	**66 dB**

The above-mentioned specifications are not binding on the manufacturer and may therefore be changed without notice. FIORENTINI can be contacted at any time for further information (point 6.1.).

UNIT OF MEASURE CONVERSION TABLE			
Length	1 inch = 1” = 25.4 mm	**Power**	1 kW = 1.36 CV = 1.34 BHP
Temperature	T (K) = t (°C) + 273 / t (°F) = 1.8 t (°C) + 32	**Pressure**	1 bar =100 kPa = 14.5 psi

3. SAFETY

3.1. RECOMMENDED USE

This is a floor scrubbing machine designed and built for use in industrial environments, to carry out wet scrubbing, drying and effluent collection on flat horizontal surfaces or surfaces with a gradient not exceeding 3% at speeds not exceeding 3 km/h. U-turns are prohibited on any gradient slopes.

3.2. MISUSE

- ***machine operation by unauthorised personnel;***
- ***scrubbing uneven and/or bumpy surfaces;***
- ***scrubbing sloping surfaces;***
- ***scrubbing surfaces with gradient values above 10%;***
- ***using the machine in environments containing dangerous substances, and in particular, in explosive atmospheres or inadequate microclimatic conditions;***
- ***cleaning machine surfaces in the presence of flammable substances;***
- ***the machine may not be used as a means of transport for people or other vehicles;***
- ***altering or tampering with safety devices;***
- ***charging batteries at not sufficiently ventilated locations;***
- ***failure to comply with applicable safety standards currently in force;***
- ***fitting equipment/devices likely to interfere with machine operation;***
- ***introducing changes or alterations not authorised by FIORENTINI;***
- ***using acid solutions likely to damage the machine;***
- ***failing to comply with use and maintenance manual specifications.***

The informative labels provided on the machine should be carefully read and should not be covered for any reason. FIORENTINI shall not be liable in any case for any of the above not recommended uses of the machine (instances of misuse).

3.3. SUGGESTED EQUIPMENT

To make the best use of your machine, equipment specially designed and tested by Fiorentini and original spare parts should be used. The Design Department of FIORENTINI S.p.A. is willing to meet any design requirements concerning parts and components for personalised applications.

3.4. OPERATOR QUALIFICATIONS

The table here below specifies the operator qualifications required for each operation to carry out.

OPERATION	OPERATOR QUALIFICATIONS
Machine operation/control	Trained operator
Installation/removal	Skilled technician
Mechanical parts maintenance	Skilled technician
Electrical part maintenance	Skilled technician
Scheduled maintenance	Trained operator
Dismantling and scrapping	Skilled technician

The personnel in charge of operating the machine should be specifically trained, particularly in regard to safety issues; machine operators must have read and become familiar with this manual.

FIORENTINI declines all responsibility for accidents involving persons or property caused by not adequately skilled, unauthorised operators using the machine.

3.5. SAFETY AND WARNING DEVICES

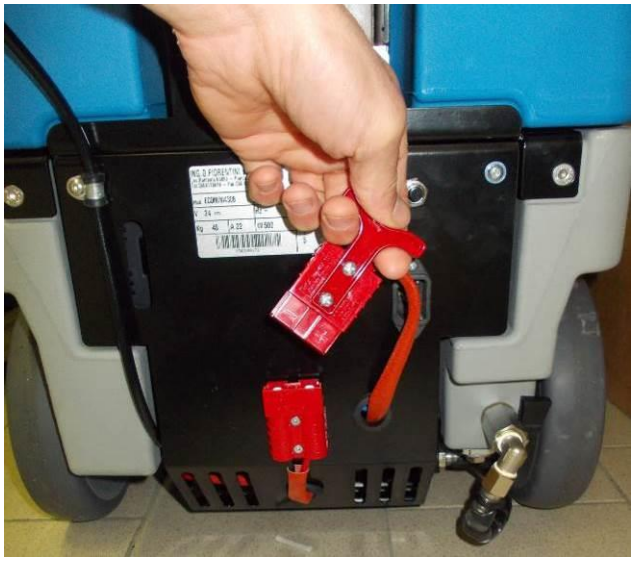
- ***It is strictly forbidden to tamper with, remove or deactivate safety and warning devices while the machine is in operation.***
- ***The efficiency of safety and warning devices should be regularly checked (see point 5.1.).***

Float	The recovery tank is equipped with a float which prevents suction in case of overfilling, warning the operator via a sound alarm; in this case, to restart the machine the tank must be emptied first (see section ***4.7.5*** **WATER DRAINING***);*

3.6. SAFETY SYSTEMS

The machine is equipped with the following safety systems:

- **Battery plug**: the battery-operated version of the machine has a plug on the rear; if pulled out, all machine functions will immediately stop. It is therefore important to become familiar with this system operation because, in case of danger, the operator must pull the plug immediately.



- **Solution water solenoid valve (machine without rotating squeegee):** The machine is equipped with a solenoid valve to let scrubbing water out only after the brushes have been powered on, so as to prevent accidental leaking;

- **Safety micro for recovery tank removal (ELECTRIC version**): the machine is equipped with a safety micro switch which interrupts the current supply to the machine whenever the recovery tank is removed in order to preventing any accidental ignition.

- **Solution pump and electric floater (machine with rotating squeegee):** The pump allows the clean water to get to the brush deck; when the tank is empty, the floater stops the pump in order to prevent any damage to it;

- **Electronic card (with rotating squeegee):** The electronic card the brush motor operation through the current consumption;

- The machine is also equipped with a **battery voltage control board**. This device ensures that, should battery charge go down below a given threshold during normal use, the machine is immediately stopped by the electronic board, preserving battery efficiency.

3.7. RESIDUAL DANGERS

Ever since the design phase, FIORENTINI has analysed all the possible dangers related to machine use in order to eliminate or at the very least minimise the risk of injuries for machine operators. In order to minimise the risk associated with residual dangers, danger signs and indications of accident-prevention systems and procedures have been provided for machine operators.

DANGER OF CRUSHING

Crushing risks are possible:

- **during scrubbing brushes adjustment;**
- **during squeegee adjustment;**
- **during recovery tank installation on the machine.**

Be extra careful during brush and squeegee adjustment: the machine should not be connected to mains power supply or, if battery-operated, it should be unplugged, to prevent unwanted machine starts.

Special danger pictograms are provided to designate critical points on the machine.

DANGER OF CRUSHING AND SHEARING

Crushing and shearing risks are possible:

- **during squeegee adjustment.**

During squeegee adjustment, ensure that no-one close to the machine is able to operate the device up- and down-stroke controls.

DANGER OF OVERTURNING

Machine overturning is possible:

- **during normal machine operation when going over slopes with a higher gradient than the recommended value and when the machine is used to clean uneven/bumpy surfaces (see 3.2).**

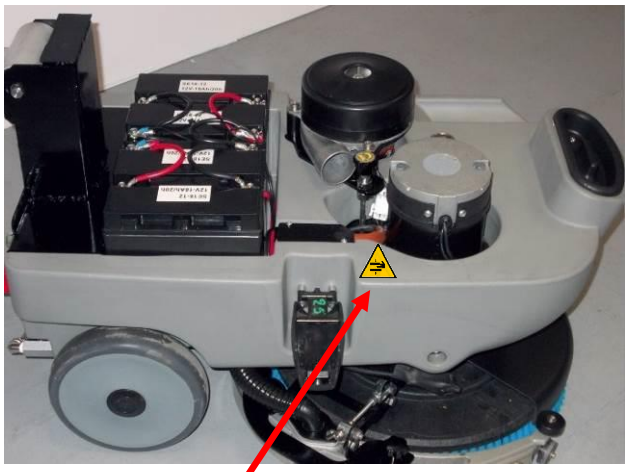
	**Do not use the machine to scrub surfaces with gradients exceeding 10% at speeds exceeding 3 km/h or bumpy or uneven surfaces likely to affect the stability of the machine.**
	*FIORENTINI declines all responsibility for accidents involving persons or property caused by machine use on stability-affecting floors. The buyer must provide suitable signage to inform the user about the condition of the working surfaces.*

3.8. SAFETY SIGNALS

The safety signs include signs indicating:

DANGERS		Danger signs are triangular with black pictograms on yellow background
PROHIBITIONS		Prohibition signs are round with black pictograms on white background and a red stripe

	**What is it?**	This sign warns that it is forbidden to remove safety guards from around moving parts.
	What to do?	During installation/maintenance, before removing guards always ensure that the starter key is not in its slot in the control panel. During work, keep body parts off the dangerous areas and ensure that guards are securely fixed.



	**What is it?**	Danger of crushing during machine recovery tank installation.
	What to do?	Before handling the recovery tank, ensure that it has been completely drained to reduce its weight and make handling easier.

If any signs become damaged, the purchaser must replace them with identical signage. It is strictly forbidden to remove or tamper with these signs.

	**What is it?**	This sign indicates a general danger
	What to do?	Be extremely careful during battery charging or tank filling and do not place any body parts below the lifted tank.

	**What is it?**	Explosion risk during battery charging due to the released hydrogen.
	What to do?	During battery charging, ensure that the machine is under a suction hood or in a ventilated area and keep it away from heat sources and corrosive substances.

	**What is it?**	This sign shows that there is a risk of fire caused by the presence of batteries.
	What to do?	Be extremely careful during battery charging or tank filling.

	***If any signs become damaged, the purchaser must replace them with identical signage. It is strictly forbidden to remove or tamper with these signs.***

4. START-UP AND OPERATION INSTRUCTIONS

4.1. TRANSPORT AND HANDLING

The machine is delivered to the purchaser fully assembled and contained in a special package, the characteristics of which are shown in figure 4.1. A black arrow on the package indicates the centre of gravity. Truck or pallet truck forks must be inserted so as to ensure that the black arrow is centred between the forks. The package must be handled carefully. Do not stack packaged items.
If agreed with the purchaser, the machine can be delivered unpacked, on a pallet and secured with straps.

	*The purchaser should check upon delivery that the machine has not been damaged during transport and that all the material listed in the shipping documentation has been received; otherwise, the forwarders and manufacturer should be promptly informed.* *Unless otherwise agreed, purchased goods will travel at the purchaser's own risk.*

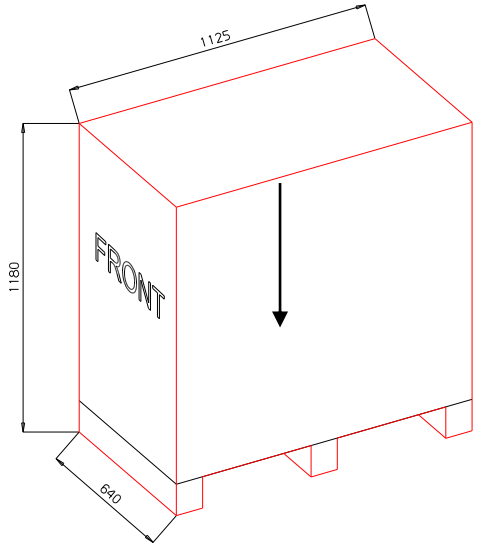


FIGURE 4.1

Handling should be carried out with suitable lifting equipment, as shown in the following table. Always ensure that the forks of the lift truck, or the harness straps, are positioned so as to ensure that the arrow printed on the package is centrally positioned on the lifting equipment. The anchoring and/or harnessing points are arranged so as to ensure that, during lifting, the machine is always steady and well balanced.

TYPE OF PACKAGING	HANDLING EQUIPMENT	
Paperboard or plywood box on a pallet	Fork lift truck	N. 4.2
None	Fork lift truck or truck crane with a two-strap balance harness	N. 4.3

The harness straps used must be suitable for the load to lift. All handling operations should be carried out at very slow speed to prevent load swinging and loss of stability. Any operation performed incorrectly may damage the machine and expose operators to dangers.

Refer to point 2.3 for machine dimensions and weight. Machine handling should be carried out by authorised personnel trained for lifting equipment use only.

LOADING DIAGRAM

FIGURE N. 4.2

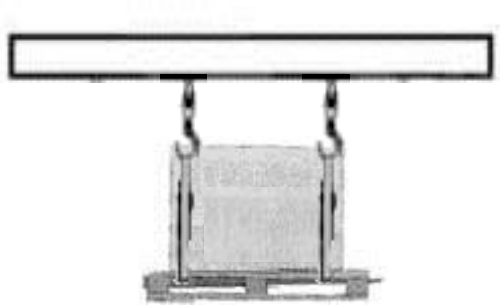


FIGURE N. 4.3

4.2. STORAGE

If not immediately installed, the machine should be stored at a covered, dry location to ensure the perfect efficiency of all its parts. Relative humidity must be below 80% and the storage temperature must be between 3°C ≤ and ≤ + 45 °C**.**

4.3. MACHINE UNPACKING

- Cut the straps bearing in mind that they might spring back
- Remove the staples fixing the carton to the pallet
- If the crate is made of plywood, remove the staples from each side and the base of each panel
- Cut the straps that secure the machine
- Place the machine on the floor

4.4 UNPACKED MACHINE HANDLING

- Inspect the machine and install the batteries if not already installed (battery-operated version).
- To prepare the machine for short distance handling after use, disconnect the battery cables and remove the brushes and the squeegee; for longer-distance transport, the machine should be repacked in its original packaging.

4.5. INSTALLATION

Installation must be carried out by authorised personnel aware of the instructions contained in this manual.

4.5.1 BATTERY INSTALLATION (Battery powered version)

Follow these instructions for battery installation:

- Remove the key from the control panel to prevent an unwanted machine power-on;
- Undo the side fixings and remove the top tank from the machine (detail 1 fig. 4.4);
- Place the battery pack in its special compartment;
- Clean the connection surfaces and connect to the machine system (detail 2 fig. 4.4); **N.B.:** the two black cables identified by the + and – stickers are the battery charger cables;
- Never add distilled water after charging the batteries;
- Replace the tank on the machine and close back the special fixings.

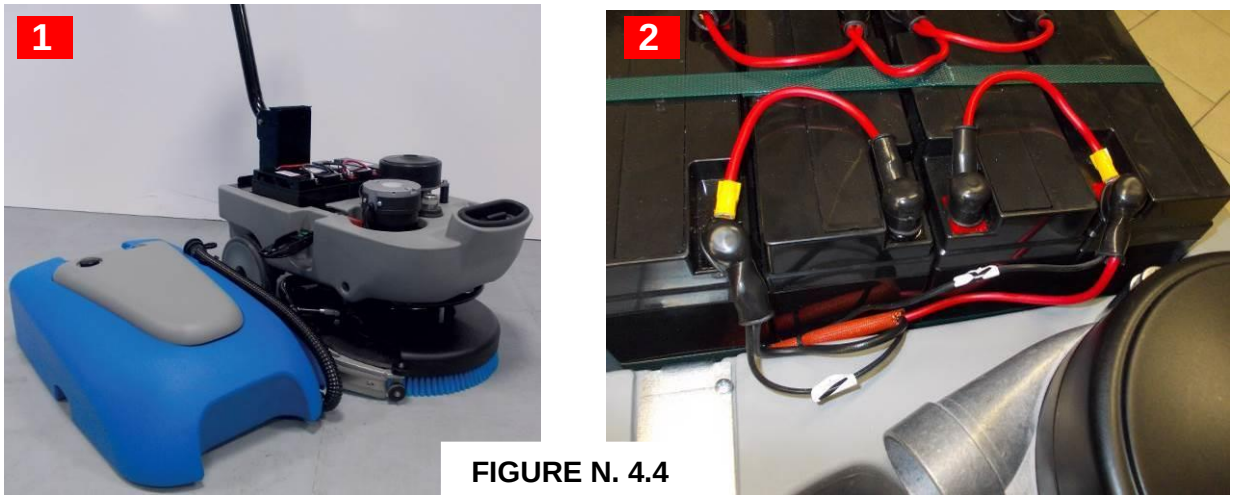


FIGURE N. 4.4

4.5.2 BATTERY CHARGER INSTALLATION (Battery-powered version)

The machine is equipped with a built-in battery charger. To charge the batteries:

- Select a dry, ventilated place, away from heat sources and corrosive environments;
- Unplug the batteries (detail 1 fig. 4.5);
- Plug the battery charger into the mains supply via the special cable;
- The battery charge state can be monitored via the indicator provided next to the socket; during charging, the red light is on, when charging is complete, the green light goes on (detail 2 fig. 4.5);
- After charging completion, unplug the machine from mains supply and plug the batteries back in (detail 1 fig. 4.5);

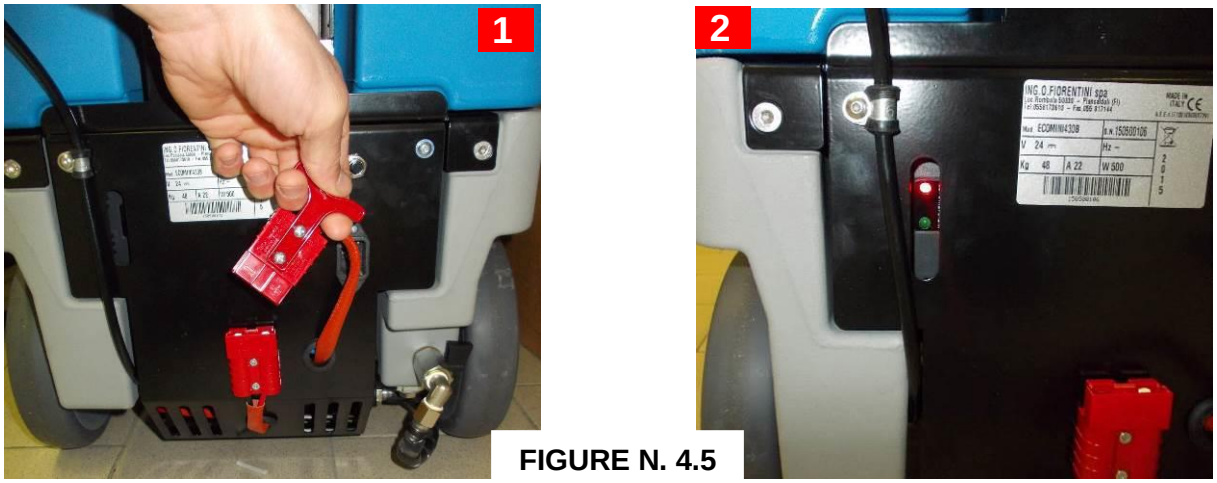


FIGURE N. 4.5

4.6. CONTROL AND MONITORING DEVICES

4.6.1 CONTROL PANEL

The control panel consists of a number of switches used to activate/deactivate all machine functions. Each switch is associated with a pictogram uniquely representing the switch function.

- **Battery-operated version**:

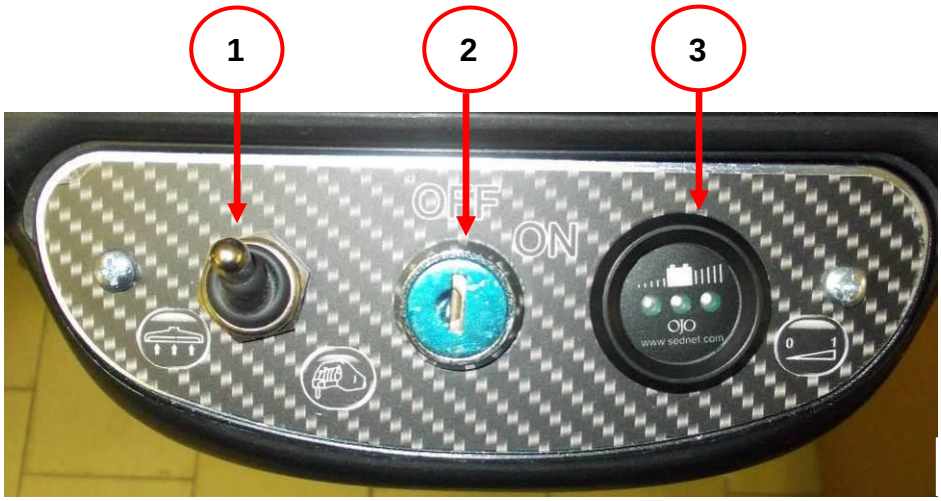


FIGURE N. 4.7

N.	DESCRIPTION	FUNCTION
1	**Suction switch**	If set to its top position it activates the squeegee liquid suction function. If set to its bottom position, the suction function is deactivated.
2	**Key switch**	Machine power-on/power-off.
3	**Battery charge indicator**	It indicates the level of battery charge.

- **Battery version with rotating squeegee:**

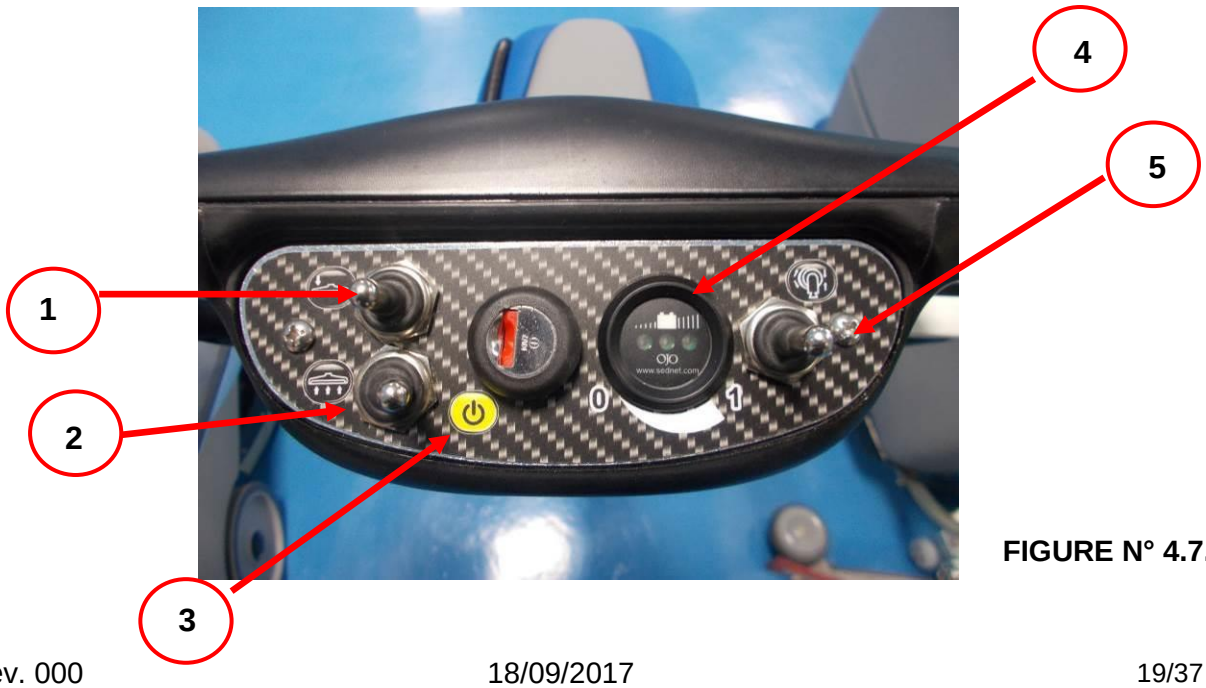


FIGURE N° 4.7.1

N°	DESCRIPTION	FUNCTION
1	**Up/down squeegee switch**	Press the button to the left to lower the squeegee. Press it to the right to lift it up.
2	**Suction switch**	Press the button to the left to action the suction function. Press it to the right to stop it.
3	**Key switch**	Machine power-on/power-off..
4	**Battery charge indicator**	It indicates the level of battery charge.
5	**Squeegee rotation switch**	Set the button to the top to rotate the squeegee. Set it in its bommom position to return the squeegee to the original position.

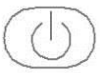
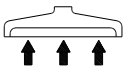
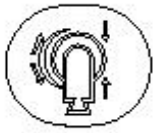
	Make sure that the squeegee is on the floor when you want to rotate it, in order to avoid an imperfect position at stroke end.

➢ Electrically-powered version

FIGURE N. 4.8

N.	DESCRIPTION	FUNCTION
1	**Start button**	Machine power-on/power-off.
2	**Suction control button**	It starts and stops the squeegee liquid suction function.

Below are the symbols on the control panel with a short description of the corresponding function:

	Key switch (battery-powered version)		Machine start (electrically powered version)
	Suction on/off		Battery charge state indicator (battery-powered version)
	Squeegee rotation		Squeegee up/down

4.6.2 CONTROL LEVERS

- **Brush control lever (detail 1 fig.4.9):** by actuating this lever, scrubbing brush rotation will be controlled; both levers operate the same switch, therefore, it is enough to control one to actuate the function;
- **Handle angle adjustment lever (detail 2 fig.4.9):** it is used to adjust the machine guiding handle inclination;
- **Squeegee lifting lever (detail 3 fig.4.9):** it is used to lift/lower the machine squeegee; if set to its top position it will control squeegee lifting off the floor; if set to its low position it will control squeegee lowering to the floor.

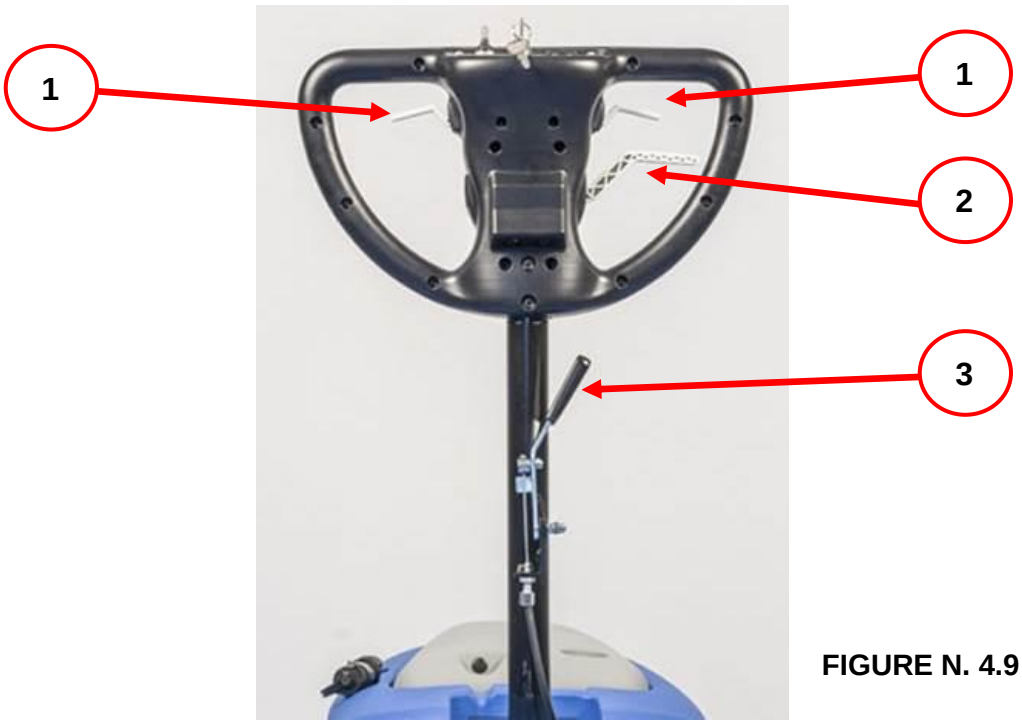


FIGURE N. 4.9

4.7. OPERATION

Scrubbing operations are highly critical and specific experience will help you choose the right type of scrubbing brush and detergent and determine whether or not a double cleaning cycle is necessary.

Carry out scrubbing in the following steps:

- Start the machine;
- Start brush rotation via the special lever;
- Start liquid suction via the squeegee;
- Lower the squeegee with the special lever (figure 4.9 detail 3);

After completing these steps, the machine will be ready to work.

4.7.1 MACHINE PREPARATION AND START-UP

If your scrubber machine is powered off the mains (electrically powered version), it should be unplugged from the panel; fill with washing water by lifting the special cover (detail 1 figure 4.10); if your scrubber machine battery charger is plugged in (battery-powered version), unplug it and connect the battery plug to the machine power outlet (detail 2 figure 4.10).
The machine can now be started. Scrubbing can now be carried out.

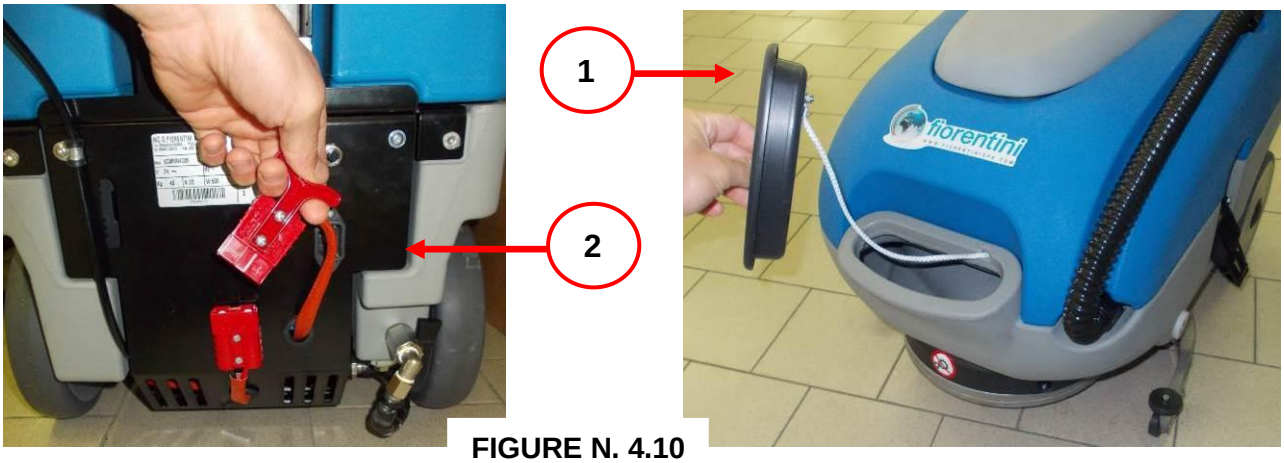


FIGURE N. 4.10

4.7.2 CHOOSING THE RIGHT DETERGENT

Choosing the right detergent is very important for efficient floor cleaning. Too strong a detergent could cause damages. Low-foaming detergents or foam preventing additives should be used to prevent damages to the suction motor. If these products cannot be procured, try adding 50cc of common wine vinegar to the recovery tank before starting the cleaning cycle.

Make sure that the detergent used is suitable for the surface to clean. Fiorentini S.p.A. will not accept any responsibility for damages caused by too aggressive detergents.

4.7.3 GUIDING HANDLE ADJUSTMENT

The Ecomini machine is equipped with an adjustable angle handle to better adapt to each operator's height and needs. The handle can be bent forwards until it rests on the machine top side to minimise the machine footprint when stored (fig. 4.11).

To adjust the handle angle:

- Actuate the lever on the machine handle (detail 2 fig. 4.9);
- Move the handle to your required angle then release the lever.

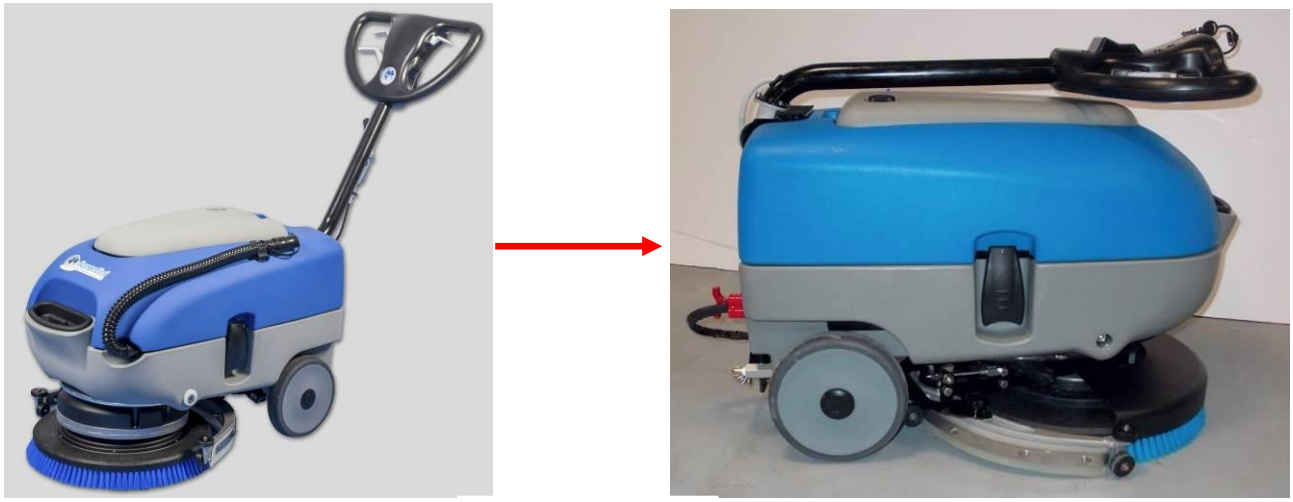


FIGURE N. 4.11

4.7.4 SQUEEGEE ADJUSTMENT

To guarantee efficient drying, it is essential for the squeegee to be perfectly adjusted.
This type of squeegee is very efficient in collecting water to facilitate pipe suction, but very sensitive to parallelism with the ground.

To ensure correct squeegee adjustment, follow the steps here below:

- Remove the key from the control panel to prevent unwanted starts (battery-operated version) or unplug the machine from the mains power outlet (electrically operated version);
- Adjust the squeegee angle via the special control (figure 4.12).

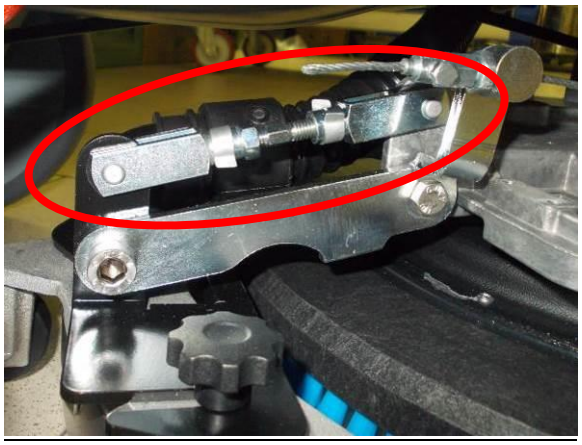


FIGURE N. 4.12

4.7.5 RECOVERY WATER DRAINING

The machine is equipped with a hose to drain water from the recovery tank.

To drain water from the tank, position the machine over a sewer hole, disconnect the hose from the tank to drain and remove the rubber plug at the end of the hose.

FIGURE N. 4.13

4.7.6 SOLUTION WATER DRAINING

To drain the water from the solution tank, disconnect the hose and open the tap. (See Figure 4.14).

FIGURE N° 4.14

For the machine with rotating squeegee, when emptying the solution tank, pay attention to water level as the floater must not intervene otherwise the water pump does not work.

4.7.7 a BRUSH REPLACEMENT (STANDARD VERSION)

Proceed as follows to replace the brush:

- Remove the key from the control panel to prevent unwanted starts (battery-operated version) or unplug the machine from the mains power outlet (electrically operated version);
- Empty both tanks to reduce the machine weight as much as possible;
- Lift the machine and release the brush by rotating it clockwise (detail 1 fig. 4.14);
- Position the new brush below the connector (checking that the brush slots match the machine flange profile) and lower the machine again (detail 2 fig. 4.14);
- To connect it to the support, it is enough to even just briefly actuate brush rotation.

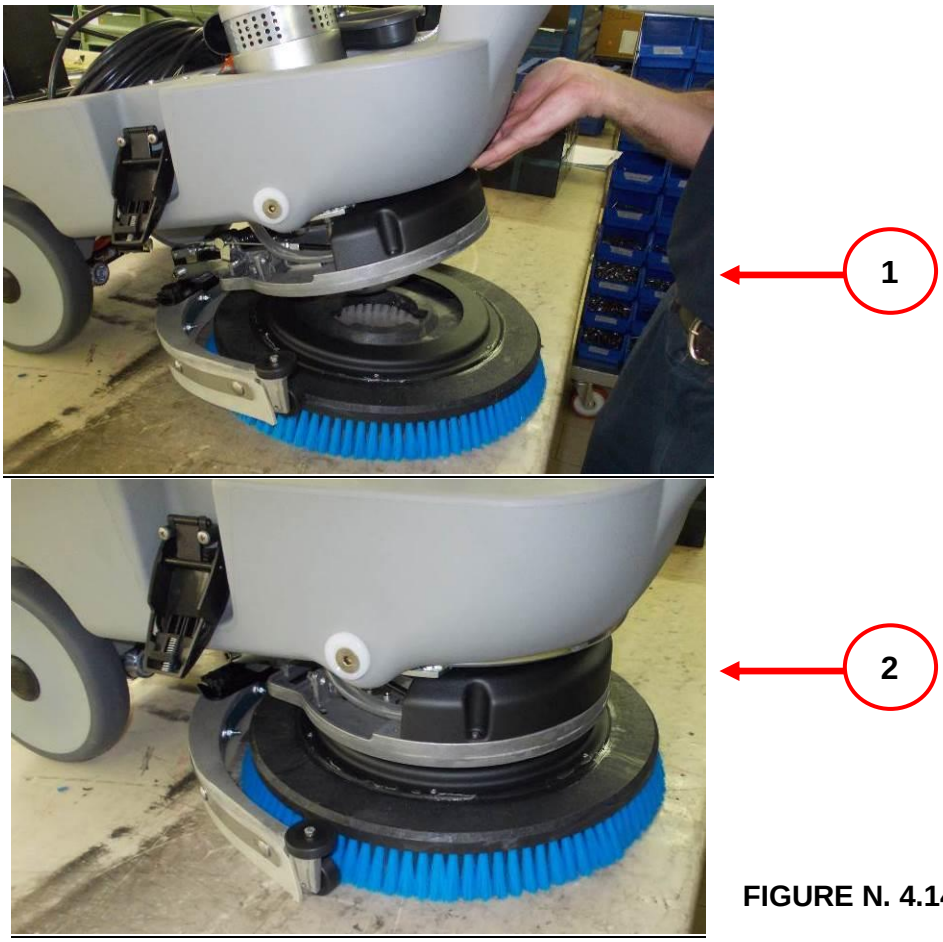


FIGURE N. 4.14

4.7.7 b BRUSH REPLACEMENT (MACHINE WITH ROTATING SQUEEGEE)

Proceed as follows to replace the brush:

- *Remove the key from the control panel to prevent unwanted starts*
- *Empty both tanks to reduce the machine weight as much as possible;*
- *Lift the machine from the back and release the brush flange by rotating it anti-clockwise (detail 1-2 and 3 fig. 4.15B);*
- *Position the new brush below the connector and rotate the flange clockwise*

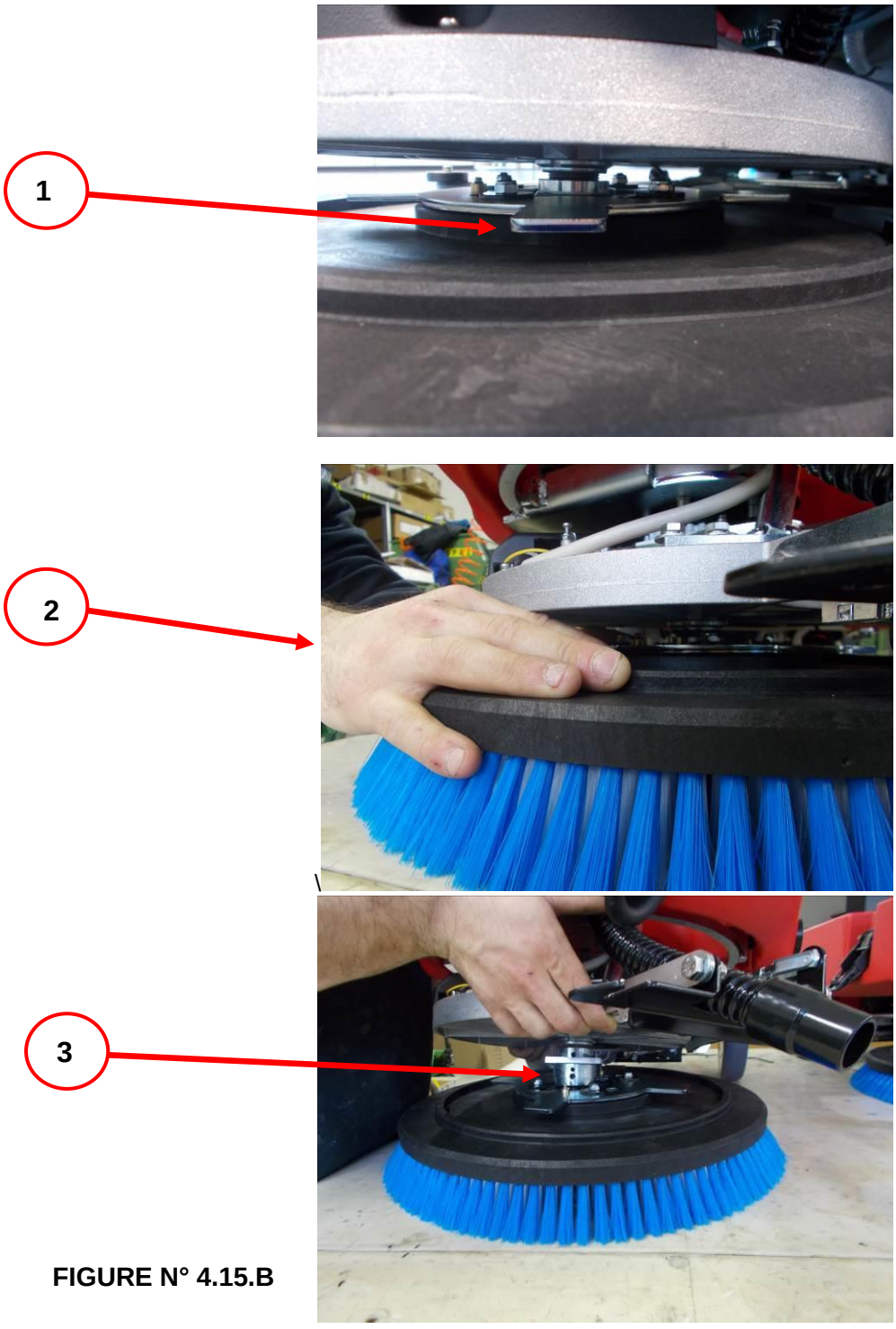


FIGURE N° 4.15.B

4.7.8 BRUSH ADJUSTMENT

To adjust the brush (only version without rotation) proceed as follows:

- remove the key from the control board to prevent accidental ignition;
- prepare the necessary tools;
- anti-clockwise rotate the eccentric bushings;
- turn the machine on and advance to check if the scrubber proceeds straight without jumping: if this does not happen repeat the adjustment.

FIGURA N° 4.16

For the machine with **rotating squeegee**, there must be no intervention by the operator. The above mentioned bushings must stay in the position shown in figure 4.16 detail 1.
The machine can dry both forward and backward, therefore the brush must be perfectly parallel to the floor.

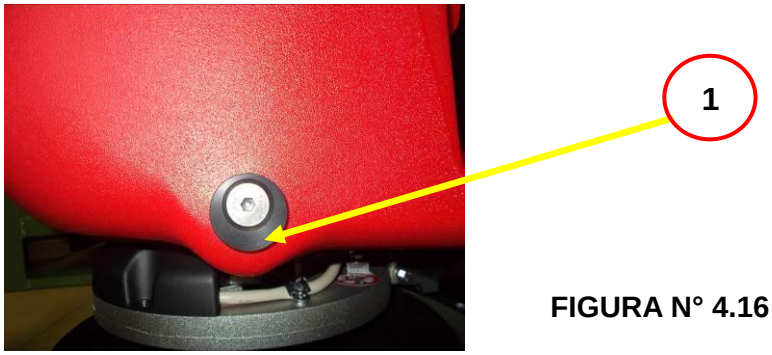


FIGURA N° 4.16

4.7.9 SQUEEGEE BLADES REPLACEMENT

The squeegee blades (figure 4.8) must be replaced when the edges become worn; the blade edges must be sharp to ensure perfect drying.

To replace the squeegee proceed as follows:

- Remove the key from the control panel to prevent unwanted starts (battery-operated version) or unplug the machine from the mains power outlet (electrically operated version);
- Loosen the fixing knobs, remove the squeegee from the machine and place it on a work top (fig. 4.15).
- Remove the internal and external bolts, remove the steel strips and the worn-out blades.
- Insert new blades and strips, tighten the bolts then adjust the squeegee with the special adjuster (fig. 4.12).
- Now reverse the order of the above operations to install the squeegee back on the machine.

FIGURE N. 4.15

5. MAINTENANCE

5.1. ROUTINE MAINTENANCE

Carrying out maintenance at regular intervals is extremely important to ensure the floor scrubber efficiency and prolong its working life to the end of the warranty time. The performed services should be logged in writing by using the special form contained in this manual.

- *Trained personnel only may service the machine and in particular, its electric and electromechanical parts. Specific tools and equipment should be used according to the type of service.*
- *For servicing and spare part requirements exclusively contact Fiorentini S.p.A. (point 6.1. / 6.2.).*

OPERATION	TASKS	FREQUENCY
Cleaning	Clean the recovery tank and the suction motor filter	Daily
	 • ***Do not use corrosive substances.*** • ***Do not use pressurised water jets.***	
	➢ Check the cleanness of the suction pipes and squeegee	Weekly
Checks	➢ Check the condition of the squeegee rubber suction blades ➢ Check the battery water level	Every 2 weeks
	Check the clean water tank filter	Monthly
	Check and adjust the braking system	Every 3 months
	Check battery cable connections	Every 6 months
	Check the brushes of each motor	Yearly
	➢ Check the safety devices ➢ Check the wiring system	Yearly

5.2 BATTERY MAINTENANCE

The operator is expected to check the battery state of charge while the machine is in operation via the battery charge indicator on the dashboard. Battery state can be checked via the specially provided three LEDs:

- Top LED: battery fully charged
- Middle LED: battery partly charged
- Bottom LED: battery flat

Leave the battery compartment open during charging
- *Do not use naked flames or smoke near batteries*
- *Warning: battery acid is corrosive*
- *Do not produce sparks near batteries*
- *Battery gases are explosive*
- *Do not reverse battery polarity*

5.2.1 HYDROMETRY

The battery charge state should be checked while the batteries are charging by using a hydrometer. Proceed as follows:

- By using a syringe hydrometer draw a small quantity of electrolyte to cause the float to rise to the surface;
- Make sure that its top does not touch the rubber bulb or stick to the glass walls under the effect of capillarity.
- For hydrometric measurements, after adding distilled water wait for density to become homogeneous throughout the volume of liquid contained in the element.

5.2.2 WATER TOP-UPS

- Add distilled water to each battery cell before charging to bring liquid level to 6 mm above the plates.
- This operation should be repeated whenever the level goes down, or in any case, at no more than one week's intervals.

5.2.3 CHARGE LIMITS

Battery charging is not necessary if, at end of a day's work, hydrometric values have not gone below 1.24 (28 Bè). The highest recommended temperature is 45°C. If the electrolyte temperature is 10/12 °C higher than the environment temperature, the batteries could overcharge
regardless of the actually reached temperature.

5.2.4 STANDBY OR INACTIVE BATTERIES

Inactive batteries will lose their charge spontaneously (self discharge). If a battery inactivity period is expected, carry out the following operations:

- Charge the batteries once a month by selecting a "charge end" current intensity, until considerable gas development is observed in all the cells, and voltage and specific gravity readings remain constant for 3-4 hours;
- This should also be done if specific gravity measurements are high. Store inactive batteries in a dry place

5.2.5 BATTERY CHARGER TECHNICAL FEATURES

The battery charger must have the characteristics listed below and be up to the following standards and regulations:

INPUT	**240V, 50-60Hz**
OUTPUT	**V24, 3A**

Directive:

Electromagnetic compatibility 2004/108/EEC

Low voltage 2006/95/EEC

N.B. The operator must refer to the battery charger user manual for maintenance and inspection instructions in case of any problems experienced with batteries.

Check recommended battery specifications in section 2.3 TECHNICAL DATA SHEET.

5.2.6 BATTERY DISPOSAL

Batteries are classified as "toxic and hazardous" waste. For disposal purposes, they should be committed to specialised, specifically authorised companies whose qualifications must be ascertained by the battery owners. Temporary battery storage before collection by a specialised disposal company must be in line with the following legal requirements:

- A temporary storage authorisation must be obtained
- The batteries must be sealed in plastic containers having capacities not lower than the volume of the electrolyte contained in the batteries, or in any case, stored in such a way as to prevent rainwater seeping into the storage containers.

5.3 MOTOR MAINTENANCE

5.3.1 MAINTENANCE OF THE SUCTION MOTOR

The suction motor must be checked and cleaned. Every six months, the motor brushes should be checked and replaced, too - if necessary. Suction motor maintenance should be carried out as follows:

- Remove the key from the control panel to prevent unwanted starts (battery-operated version) or unplug the machine from the mains power outlet (electrically operated version);
- Empty the recovery tank to minimise its weight before removing it from the machine;
- Remove the three screws fixing the motor to the solution tank then remove it from its seat (detail 1 fig. 5.1);
- Remove the plastic cover and remove the motor brushes from their housing (detail 2 fig. 5.1);
- To re-assemble all the parts, perform the same operations in reverse order.

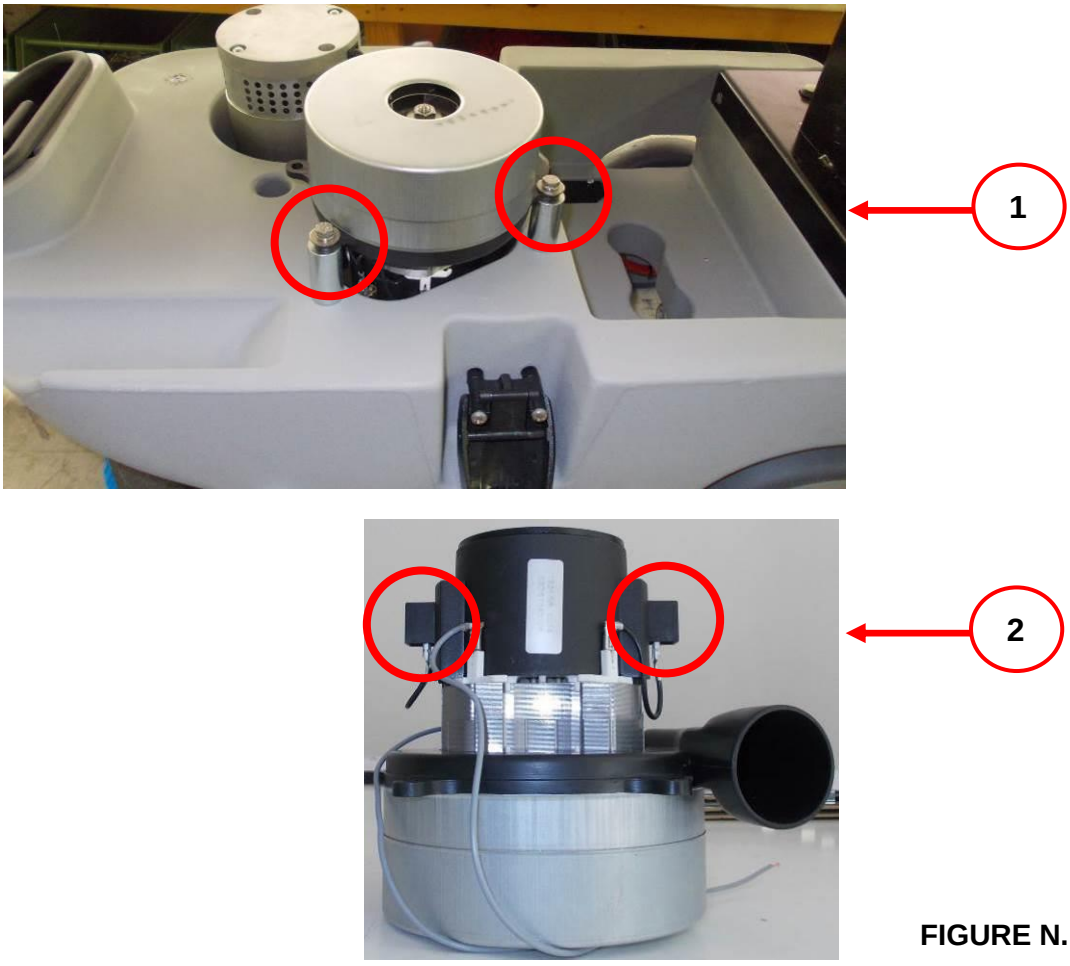


FIGURE N. 5.1

5.3.2 BRUSH MOTOR MAINTENANCE

To ensure scrubbing brush motor perfect efficiency, the motor brush wear should be checked yearly and the motor brushes should be replaced, if necessary.

Brush motor maintenance should be carried out as follows:

- Remove the key from the control panel to prevent unwanted starts (battery-operated version) or unplug the machine from the mains power outlet (electrically operated version);
- Empty the recovery tank to minimise its weight before removing it from the machine;
- Remove the motor grid fixing screw (fig. 5.2);
- Remove the motor grid to obtain easy access to the motor brushes (fig. 5.2);
- To re-assemble all the parts, perform the same operations in reverse order.

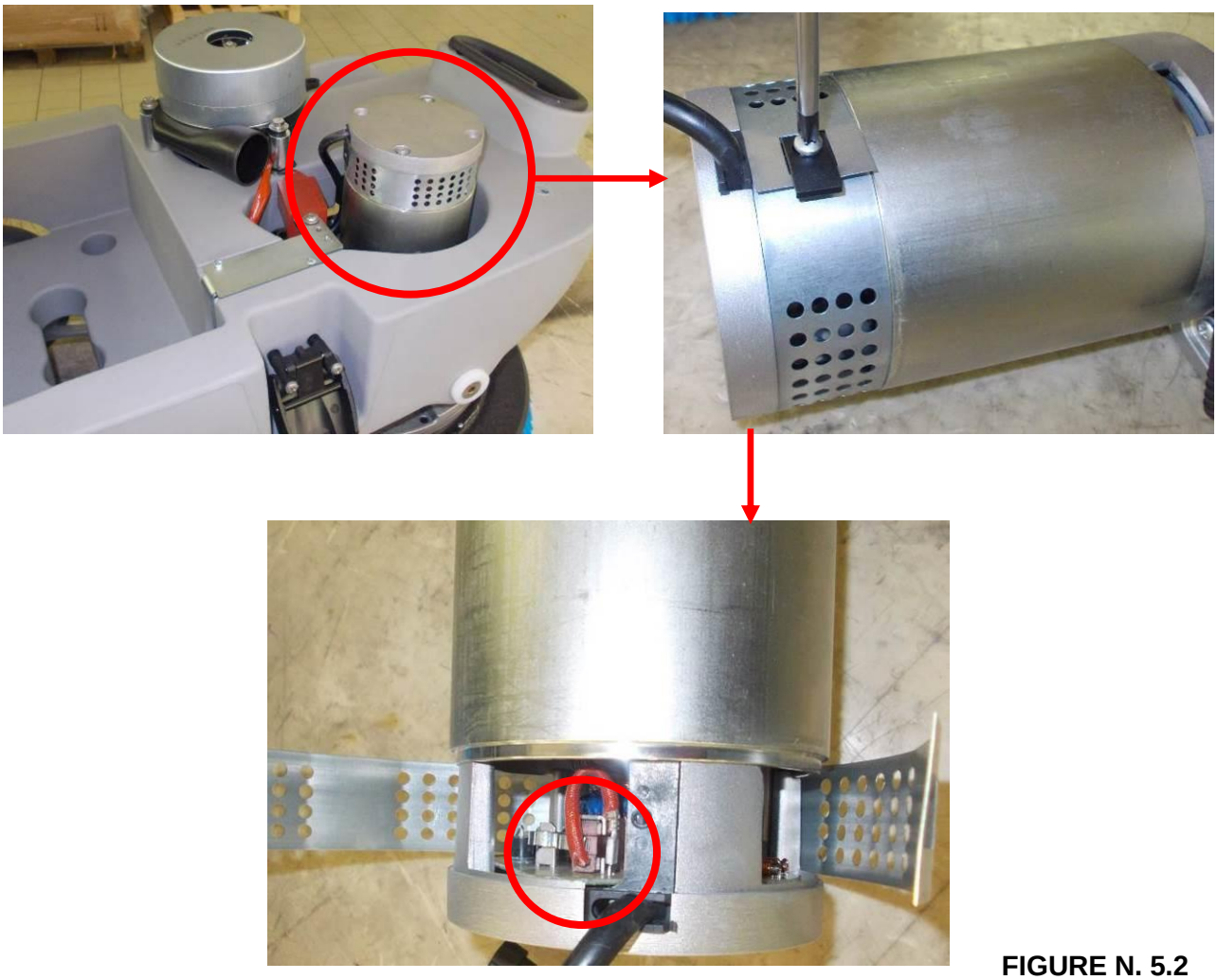


FIGURE N. 5.2

5.4 WIRING SYSTEM CHECKS

The machine wiring system should be inspected and examined every 2 years. It is very important to immediately correct any defects, e.g. disconnected wires or burnt cables.

	Any service on the wiring system should be carried out by a skilled technician. *Any maintenance or repair not described as routine maintenance should be carried out by specialised personnel authorised by FIORENTINI.*

5.5 SUMMARY TABLE OF THE RECOMMENDED CHECKS

	FREQUENCY	REQUIRED TECHNICIAN
INSPECTIONS		
Safety devices	2 years	Skilled technician
Electrical wiring system	2 years	FIORENTINI technician
Braking system	3 months	Skilled technician
Complete overhauling	5 years	FIORENTINI technician
MAINTENANCE		
Recovery tank cleaning	Daily	operator
Suction motor filter	Daily	operator
Clean water tank filter	Monthly	operator
Suction pipe lines cleaning	Weekly	operator
Squeegee cleaning	Weekly	operator
State of blades inspection	Weekly	operator
Battery fluid level inspection	Weekly	operator
Battery cable fixing	6 months	Skilled technician
Motor brush level in each motor inspection	Yearly	Skilled technician

5.6. MAINTENANCE LOG

DATE	*MAINTENANCE OPERATOR*	*TYPE OF SERVICE/NOTES*	*SIGNATURE*

6. TECHNICAL ASSISTANCE

6.1. TECHNICAL ASSISTANCE CONTACT INFORMATION

For services under the warranty and/or to request maintenance or repairs, or for any inquiries, please contact the Technical Assistance Department of FIORENTINI S.p.A. at:

ING. O. FIORENTINI S.p.A.

"THE BEST IN FLOOR MACHINES"

BRANCH OFFICES:
20132 MILAN – Fax. +39 02/2592779
Via Palmanova 211/a – Tel. + 39 02/27207783 - 2564810
00012 Guidonia Montecelio (ROME) – Fax. +39 0774 353419 - 353314
Via B. Pontecorvo 20 – Tel. + 39 0774 357184 - 378827
PRODUCTION FACTORY:
50033 PIANCALDOLI (FI) – Fax. +39 055/817144
Via Piancaldoli 1896 – Tel. + 39 055/8173610

Most technical problems can be sorted with minor services. Before contacting our Technical Assistance Dept. we therefore advise to carefully read this manual.
If specialist service is required, please clearly specify the type and circumstances of the observed defect to help us find the best solution.

6.2 CLAIM REPORT

Fiorentini S.p.A., wishing to meet its customer requirements in the most effective manner and to constantly improve its products on the basis of valuable feedback obtained from customers themselves, has prepared a claim form to report any defects observed during use of its floor scrubber.

Form completed by:

Company: _____

Writer's name: _____

Position within the company: _____

Date: _____ Signature: _____

Machine description:

Machine: _____ Model: _____

Purchase date: _____ S.N.: _____

Applicable Warranty: ❑ YES ❑ NO Worked hours: _____

Machine work environment: _____

Fault Description:

Code of the faulty component: _____ Component name: _____

Fault type:

- ❑ Faulty Mechanical component
- ❑ Faulty operation
- ❑ Wiring system failure
- ❑ Motor/Engine failure
- ❑ Missing component
- ❑ Excessively noisy operation
- ❑ Water leak
- ❑ Other

Short fault description: _____

Customer remarks:

Please write below your comments and suggestions regarding the products and services supplied by Ing. O. Fiorentini S.r.l.

_____

_____

_____

Mat no.
Serial no. _____
Nr. de série

Data di spedizione
Date of shipment _____
Date d'expédition

Distributed by:

ING. O. FIORENTINI S.p.A.

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