



fiorentini

WWW.FIORENTINISPA.COM

Organizzazione con
Sistema di Gestione Certificato
ISO 9001:2008



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

SWEeper

MOD. MINISWEEPER



USER AND MAINTENANCE MANUAL

Rev. 00

Congratulations for your choice!

FIorentini S.p.A. thanking you for the preference to our product, would like to remind you that **FIorentini's S.p.A.** production covers manufacture and marketing of industrial cleaning machines and is currently a leading company in this sector.

Our tradition and competence guarantee technical quality of your choice; actually all our products are being built first quality materials through criteria that can give reliability, solidity and functionality satisfying every kind of customers. **FIorentini** has recently obtained the quality system certificate conforming to the requirements of **UNI EN ISO 9001:2000**.

We wish therefore inviting you to contact us, unhesitatingly, for every kind of request, as technical or commercial; we'll be pleased to be at your disposal for any information you may need.

INDEX

1. GENERAL INFORMATION	Pag.	4
1.1. Symbols.....		4
1.2. Warning.....		4
1.3. Manual Consulting.....		4
1.4. Warranty.....		4
1.5. Conformity Declaration.....		6
2. FEATURES AND TECHNICAL DATA OF THE MACHINE		8
2.1. Identifying the Machine.....		8
2.2. Description and Parts of the Machine.....		8
2.3. Technical Data.....		10
3. SAFETY		11
3.1. Right Use of the Machine.....		11
3.2. Wrong Use of the Machine.....		11
3.3. Suggested Equipment.....		11
3.4. Operator Qualify.....		12
3.5. Protection and Warning Devices.....		12
3.6. Safety Devices.....		13
3.7. Safety Diagnostic signals.....		13
3.7.1 Other dangers.....		15
3.8 Safety signals.....		16
4. STARTING AND USE INSTRUCTIONS		18
4.1. Transport and Handling.....		18
4.2. Storage.....		19
4.3. Unpacking the Machine.....		19
4.4. Handling the Unpacked Machine.....		19
4.5. Installation.....		20
4.5.1. Batteries Installation.....		20
4.6. Control Devices.....		21
4.6.1. Dashboard.....		21
4.7. Functioning.....		22
4.7.1. Levers and Pedals.....		22
4.7.2. Main Brush Replacement.....		23
4.7.3. Side Brush Replacement.....		24
4.7.4. Waste Tank Emptying.....		24
4.7.5. Suction Engine Maintenance.....		25
4.7.6. Filter Shaker Engine Maintenance.....		25

5. MAINTENANCE	26
5.1. Periodical Maintenance	26
5.2. Batteries Maintenance.....	26
5.2.1. Hydrometry.....	27
5.2.2. Water Filling Up.....	27
5.2.3. Charge Limits.....	27
5.2.4. Off duty or inactive batteries	27
5.2.5. Batteries disposal	27
5.3. Electric System Control.....	28
5.4. Tests to be carried out	28
5.5. Maintenance Register.....	29
6. SERVICE	31
6.1. Service Adresses.....	31
6.2. Claim Report.....	31

1. GENERAL INFORMATION

1.1. SYMBOLS

	<p><i>This symbol is used to get the operator's attention on procedures or precautions to be followed in order to avoid damages to users or to the support</i></p>
	<p><i>This symbol is used to get the operator's attention on general information.</i></p>

1.2. PREMISE

	<p>FIorentini S. p. A. is the only owner of this manual. <i>The reproduction of all or part of the manual or the transmission to third parties with mechanic or electronic devices are forbidden without a written manufacturer's authorization. This manual is supplied to the customers in one original copy when differently specified in the order.</i></p> <p><i>This manual is supplied to the customer with the machine and it must be kept with it even when the machine has to be transferred. Please, keep the manual in a safe place and for all the machine lifetime. In case of loss ask for a duplicate to FIORENTINI S.p.A.</i></p> <p><i>FIORENTINI S.p.A. is not responsible for any kind of damages caused by people or things due to the non-observance of the instructions dealt in this manual.</i></p> <p><i>FIORENTINI reserves the right to add at any time and without notice all the technical and commercial changes considered useful for the customer. Therefore data and information in this manual can be updated.</i></p>
---	--

1.3. MANUAL CONSULTING

This manual deals exhaustively with all arguments that are necessary for an easy and safe use of the machine as it is recommended by European Directives on product safety.

Therefore we suggest to all authorized operators to read carefully this manual contacting FIORENTINI S.p.A. for any explanation. The manual has to be used every time the operator forgets a procedure or when new operators have to be trained.

For publishing reasons, pictures and drawings can look different from the reality but without arising doubts.

Special symbols and **bold type** and/or *sloping* get the attention of the reader on remarkable information in particular for safety.

The revision index is written on the left at the bottom of every page. The list of those pages that have been updated has to be found at the end of the manual.

1.4. WARRANTY

Warranty conditions are stated as below when not differently specified in the order confirmation.

WARRANTY OBJECT

The machine has been designed and built for a long-lasting use without relevant problems. Anyway, if problems arise during the warranty period, FIORENTINI S.r.l. is engaged to repair or substitute for free those parts that are broken or damaged by defective materials, working defects or imperfect assembly.

Warranty is not given for parts whose early breaking or wear and tear are due to:

- Non-respect of instructions included in this manual;
- Breaking and/or changes made up without FIORENTINI's approval;
- Not-use of genuine spare parts;
- Interventions made up by unauthorised personnel;
- Missing maintenance;
- Natural calamities.

FIORENTINI S.p.A., its purchasers and its suppliers have the same warranty for the electric and expendable materials that are sold by external suppliers.

WARRANTY CONDITIONS

Warranty is granted for 12 months since the delivery date of the machine. This is a single warranty term and it cannot be extended.

RETURNED GOODS

Intervention demands must be sent to FIORENTINI Service Dpt. only after a careful analysis of the problem and its causes. Following information have to be given to FIORENTINI's agent:

- **Serial number you get it from the silver label stuck on the machine (§ 2.1.);**
- **Code and position of the component taken from the spare parts list (§ 7.2.);**
- **A detailed description of the problem and its causes.**

The components considered under warranty are delivered ex factory. Those ones being substituted belong to FIORENTINI Co..

Please send defected electric or electronic material separatly in order to divide and recycle material with dangerous substances (see directive about RAEE 2002/96/CEE).



EXCEPTIONS

Expandable materials like brushes, squeegee blades and materials whose lifetime cannot be predetermined are not under warranty.

APPLICATION MODALITY

Defective components must be sent back to FIORENTINI S.p.A. in order to establish the anomalies causes and apply therefore the warranty. Repair and replacement under warranty will be done in FIORENTINI's workshop, by third parties or in loco. In case of repair or replacement in loco, energy sources and the use of particular equipment have to be paid by the customer himself.

INTERVENTION DEMANDS

Intervention demands must be sent to FIORENTINI Service Dpt. only after a careful analysis of the problem and its causes. Following information have to be given to FIORENTINI's agent:

- Serial number you get it from the silver label stucked on the machine (§ 2.1.);
- Code and position of the component taken from the spare parts list (§ 7.2.);
- A detailed description of the problem and its causes.

The components considered under warranty are delivered ex factory. Those ones being substituted belong to FIORENTINI Co..



The warranty of the machine is no more available in case of the loss of the silver label.

1.5. CONFORMITY DECLARATION

Conformity declaration is released with the machine and the user manual.

**DICHIARAZIONE CE DI CONFORMITA'-DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE-EG-KONFORMITÄT SERKLÄRUNG-
DECLARACION DE CONFORMIDAD**

(ai sensi dell'allegato II 1.A della Direttiva Macchine 2006/42/CE)

La ING.O.FIORENTINI SPA

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

DICHIARA/DECLARES/DECLARE/ERKLÄRT/ DECLARA

in 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



Modello/model/modèle/Typ/modelo

Matricola/serial number/numero de série/

Fabriknummer/ Número matricula

Anno di costruzione /

Year of production/ Année 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 directive machines 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 electromagnética 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° IT1201000007391)*

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
The technical dossier consists of Ing.O.Fiorentini Spa as a legal person - via Piancaldoli 1896 Firenzuola 50033 Fraz. Piancaldoli (FI) - Italy
Le dossier technique est constitué de Ing.O.Fiorentini Spa comme personne juridique - via Piancaldoli 1896 Firenzuola 50033 Fraz. Piancaldoli (FI) - Italie
Die technische Dokumentation besteht aus Ing. O.Fiorentini Spa as a legal person - via Piancaldoli 1896 Firenzuola 50033 Fraz. Piancaldoli (FI) - Italy
El expediente técnico se compone de Ing.O.Fiorentini Spa como una persona jurídica - via Piancaldoli 1896 Firenzuola 50033 Fraz. Piancaldoli (FI) - Italia

Piancaldoli
Luogo e data

Ing. O. Fiorentini S.p.a.
Il Legale Rappresentante/president/gérant/ representante
Angelica Maria Cerutti

Firma

Cerutti Angelica Maria

2. FEATURES AND TECHNICAL DATA OF THE MACHINE

2.1. IDENTIFYING THE MACHINE

A silver label is stuck on the protection case of the steering column and clearly shows the data referring to the “CE” brand.

Ing. O.Fiorentini S.p.A.		MADE		CE
50030 Piancaldoli (FI)		IN ITALY		
Mod	MINISWEEPER	S.N		2
V		Hz		0
Kg		A	W	9



FIGURA N° 2.1



The label has never to be removed and should always be kept readable. In case of damage it is necessary to ask for a duplicate. The autoscrubber machine cannot be sold without the label.

2.2. DESCRIPTION AND PARTS OF THE MACHINE

The machine Minisweeper is designed for the treatment of flat surfaces through the process of brushing and the following process of collection of dirt in a sharp container. The system of power is supplied by a series of accumulators batteries, which feed all the motors and the electric control.

By means of a rotating brush set in front of the machine, dirt is put in the middle of the machine. The main brush takes dirt into the waste tank. This machine must be used on dry or at least humid surfaces.

By means of the dashboard, the operator can control the functioning of the machine through a signalling system made of LEDs. The dashboard is equipped with a battery charger indicator, too.

Functions of the machine which can be operated from the dashboard:

- select forward or reverse gear;
- start the traction of the machine;
- press the horn;
- switch on or off the machine.

The machine frame is made of zinc-plated or stainless steel in order to avoid oxidation which could compromise the reliability of the machine.

Thanks to the dashboard the operator can control all the machine functions, which are listed below:

- zinc-plated or stainless steel frame;
- right side brush;
- main brush;
- suction and collecting system;
- driving wheel;
- two idle wheels;
- seat.

FIORENTINI Co., taking the new CE safety rules under consideration, manufactures the machine following the CE directives about safety and health. The materials high quality, the high technology and FIORENTINI's experience guarantee the performance and the reliability of this machine .

Each machine is tested during the manufacturing process and the final check is done before the machine is shipped out.

2.3. TECHNICAL DATA

MAIN TECHNICAL DATA	MINI SWEEPER
SWEEPING WIDTH	728 mm
CLEANING CAPACITY UP TO m ² h	3640 m²/h
BATTERY AUTONOMY	4 h
WASTE TANK CAPACITY	40 l
FILTERING SURFACE m ²	3 m²
GENERAL TECHNICAL DATA	
MECHANICAL DRIVE	REAR
MECHANICAL DRIVE (type)	DRIVING WHEEL
FORWARD SPEED Km/h	0-5 km/h
MAX SLOPE	8 %
NOISE LEVEL	65 dB
TURNING RADIUS	1750 mm
ELECTRIC SYSTEM	
POWER	24 V
VACUUM MOTOR	TO WHIRLF
CENTRAL MOTOR BRUSHE	1 x 650W/24V
LATERAL MOTOR BRUSHE	1 x 60W/24V
TRACTION MOTOR	200W/24V
VOLTAGE	2 x 12V-157A/h
DIMENSIONS AND WEIGHT	
LENGTH	1040 mm
WIDTH	690 mm
HEIGHT	1200 mm
CENTRAL BRUSHES	Ø260 x 590 mm
LATERAL BRUSHES	Ø200 mm
WEIGHT (without batteries)	110 Kg
WEIGHT (with batteries)	2x 26 Kg



The above mentioned characteristics are not binding for the manufacturer; they can be changed without any notice . ING.O.FIORENTINI Co. is always at disposal for any information (par.6.1.).

MEASUREMENT UNITS CONVERSION

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. RIGHT USE OF THE MACHINE



This sweeper has been designed for an industrial use. It can sweep on flat surface or with a max. 8% slope.

3.2. WRONG USE OF THE MACHINE



- *the sweeper cannot be driver by non authorized personnel;*
- *this machine cannot work on surfaces with holes;*
- *this machine cannot sweep on sloping surfaces;*
- *The machine cannot sweep sloping surfaces whose gradient is higher than 8%;*
- *The machine cannot be used in places with dangerous substances and in particular with explosive atmospheres or with a bad microclimate;*
- *The machine cannot clean surfaces with inflammable products;*
- *The machine cannot be used as a means of transport for people or other means of transport;*
- *The protection devices of the machine cannot be modified or tampered;*
- *Batteries must be recharged in a fanned room;*
- *The operator have always to respect safety rules;*
- *The operator cannot use equipments or devices that can create problems to the machine working;*
- *The machine components cannot be modified without FIORENTINI's authorization;*
- *The operator cannot use acids that can damage the machine;*
- *The operator has always to respect the rules written in the user manual.*



Please read carefully and do not cover the labels sticked on the machine. FIORENTINI S.p.A. is not responsible for a wrong use of the machine.

3.3. SUGGESTED EQUIPMENT

In order to use the machine in a proper way, we suggest to use the FIORENTINI's equipment and original spare parts.

FIORENTINI S.p.A. Technical Dept. is always at your disposal to design components or parts for a particular use of machine as requested by the customer.

3.4. OPERATORS' QUALIFY

The below specs shows the qualify requested from the operators depending on the kind of maintenance to be done on the machine.

OPERATION	OPERATORS' QUALIFY
Driving/control of the machine	Trained operator
Installation/ disinstallation	Fiorentini technician
Mechanical parts maintenance	Fiorentini technician
Electric parts maintenance	Fiorentini technician
Cleaning maintenance	Trained operator
Dismantling and demolition	Fiorentini technician

FIorentINI S.r.l. suggests to train the operator before using the machine. The operator also must be trained about safety rules and carefully read this manual.



FIorentINI S.p.A. is not responsible for any possible damage to people and/or things caused by the non-observance of the instructions dealt within this manual.

3.5. PROTECTION AND WARNING DEVICES



- It is absolutely forbidden to tamper or disconnect safety and warning devices while the machine is working;***
- It is important to check periodically safety and warning devices***

Central brush protection

Fiorentini Minisweeper is equipped with a central nylon brush which rotates when the machine is working. The central brush is protected on both sides by a stainless steel panel and two cases which avoid the contact with dangerous components. These protection devices can be only willingly removed from the machine.



3.6 SAFETY DEVICES

The machine is equipped with the following safety devices.

- **Socket** (picture 3.1), the same socket used for the battery charger. In case of emergency, this socket must be taken away from the plug by means of its handle.

The operator must be trained about safety rules. Do never restore this safety system before the problem has been sorted out. If it is necessary ask for the technician help.

Disconnect in case of emergency



PICTURE 3.1

3.7 SAFETY DIAGNOSTIC SIGNALS

The Mini Sweeper is equipped with a system that shows all errors noticed from the electronic cards, that controls all machine functions. These errors are displayed on the battery charge indicator, placed on the dashboard, in the form of rapid flashes.

No. of flashes	Description	Solution
1	Forward command already active when switching on the machine: the start key has been turned on with the forward command already entered.	Release the forward commande in order to stop this signal. If this does not stop it might be necessary to set the acceleration system again.
2	Battery too low or under tension, caused by a short circuit on the power. It means that the tension read from the system is lower than the minimum threshold needed for the correct machine functioning and that the version of system is not compatible with the battery installed. In different case, replace the system.	Verify that the battery is not too low, if so, recharge it. Alternatively, check that all electric connections are well fixed. If the problem is not solved it might be necessary to replace the complete system.

3	Not used	
4	Motor not connected or false contact on the motor circuit. It happens for example if the motor brushes are not touching properly on the armature or if there are loose cables.	Check the connections of the motor, its functionality and integrity.
5	Fault inside the controller or mass on the engine.	There may be a negative dispersion on the motor circuit; as alternative, it is necessary to check the regulator.
6	Fault potentiometer; it is displayed when there is no negative potentiometer. This signal indicates that the voltage read by the system is higher than that provided for the speed command and it occurs, for example, if there is no connection to the negative of the speed command	Check the wiring of the potentiometer and the integrity of it.
7	Temperature of the power circuit is too high; it occurs when the temperature of the mosfets is over 75 ° C +/- 5 ° C, that is, if the machine has worked in overload conditions, for example on high slopes for long period or at ambient temperatures above 40 ° C. It may happen even in case of damage to the motor windings, which causes an abnormal current absorption.	Wait for the temperature to fall down.
8	Segnala che si sta tentando di avviare la macchina quando questa (o il motore) è già in movimento. Engine already rotating when starting. It indicates that somebody is trying to start the machine when this (or the engine) is already working.	Stop the vehicle first and then repeat.
9	Anomaly to the microcontroller software or hardware problem. It occurs in case of failure to circuits for measuring the current and the load.	Try to turn off the vehicle. If the error still appears check the controller.

3.7.1 OTHER DANGERS

FIORENTINI S.p.A. realizes – starting from the design of the machine - all the dangers that can occur while the machine is operating in order to prevent or at least low the operator’s accidents. Thanks to a series of signals on the machine the operator can avoid many risks that can occur.

SQUASHING DANGER

This kind of danger can occur:

- during the brushes regulation;
- during the batteries maintenance.

Whilst regulating the side brushes, the central brush and the central washing brushes the ignition key must be kept away from the dashboard in order to avoid the casual starting of the machine.

Whilst the batteries recharge, the operator must pay attention that any parts of his/her body enter the batteries room.



Special labels sticked on the cartes of the brushes or on the recovery tank prevent dangers to the operator (see § 3.7.).

TURNOVER

This kind of danger can occur:

- during the normal operating of the machine when you exceed sloping limits as specified in the manual and you use the machine to clean disconnected surfaces or with holes and high depressions.



Do not use the machine to wash sloping surfaces higher than 10% or surfaces with holes or depressions which might compromise the stability of the machine.



FIORENTINI is not responsible for accidents occurred to people or things provoked by a wrong use of the machine, i.e. using the machine on surfaces which can compromise its stability.

The purchaser must stick proper labels on the machine to show the operator its right use.

3.8. SAFETY SIGNALS

Among safety signals there are:

DANGERS		Dangers' signals are triangular with black pictures on a yellow background
PROHIBITIONS		Prohibitions' signals are round with black pictures and a red stripe

	What is it?	This signal forbids to remove the protection of pieces in movement.
	What to do	During the installation or the maintenance make sure that the ignition key is not in the dashboard before removing the mobile protections. While the machine is operating make sure that all covers are well fixed.

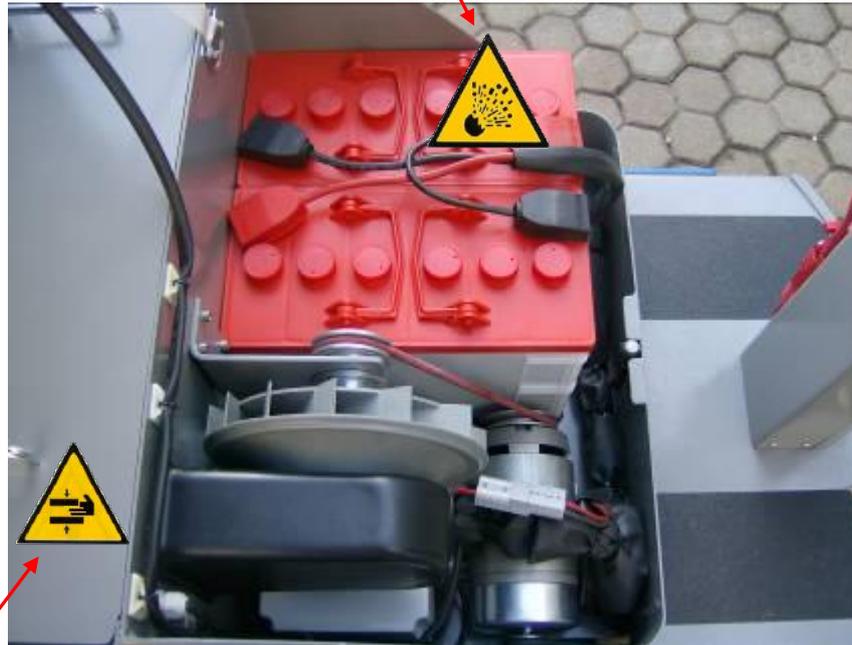


	What is it?	Crushing danger: it can be due to parts in movement of the machine.
	What to do	During the installation or the maintenance make sure that the ignition key is not in the dashboard before removing the mobile protections.



The purchaser must replace danger signals on the machine if they are damaged. It is absolutely forbidden to remove or temper danger signals.

	What is it?	Explosion danger: it may occur while recharging the batteries because of hydrogen spread.
	What to do	During the batteries recharge, please place the machine under a suction chimney or in a ventilated area and keep it away from heat and corrosive substances.



	What is it?	Risk of crushing due to overturning of the recovery tank.
	What to do	Whilst recharging the batteries, please make sure that any parts of your body got in contact with the batteries room.

	<p><i>The purchaser must replace danger signals on the machine if they are damaged. It is absolutely forbidden to remove or temper danger signals.</i></p>
---	---

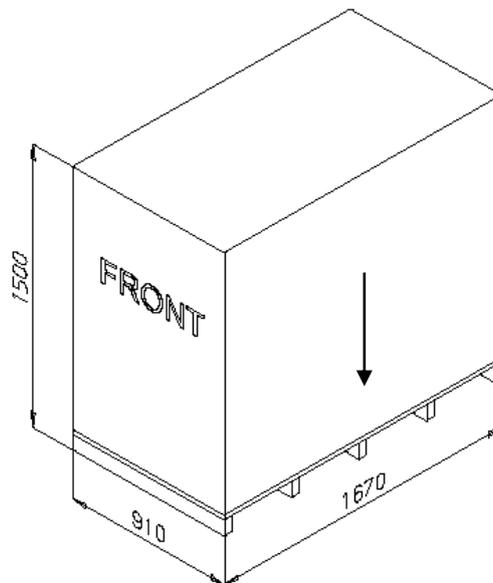
4. STARTING AND USE INSTRUCTIONS

4.1. TRANSPORT AND HANDLING

The machine is delivered to the purchaser in a proper package (see picture 4.1 below). A black arrow on the package indicates the barycentre. This arrow must be in the middle of the elevator or transpallet forks. The package must be carefully handled. Do not place one package on another one. If agreed with the purchaser, the machine can be delivered without package, placed on a pallet and fixed by means of straps.



*The purchaser must make sure that the machine has not been damaged during the transport and that all papers are on the machine. Otherwise, the purchaser must immediately contact FIORENTINI in order to sort out the problem.
The purchaser is responsible for the transport of the machine if not differently agreed with FIORENTINI.*



PICTURE 4.1

The machine must be handled with proper devices as stated in the scheme below.

Make always sure that the black arrow on the package is in the middle of the elevator forks or the straps. Anchorage and/or strapping points are set up in order to keep the machine on balance during the transport.

PACKAGE	HANDLING EQUIPMENT	PIC.
Carton box or plywood box on a pallet	Fork elevator	Nr. 4.2

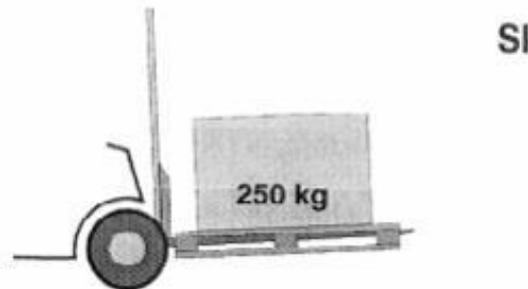


Bands used for lifting the machine up must have the same loading capacity as the machine load. Handling operations must be done without causing a loss of stability of the machine. Otherwise, the machine can be damaged or the operator can be in danger.



FIORENTINI suggest to use authorized personnel (see § 2.3.) to handle the machine.

LOADING SYSTEM



PICTURE N° 4.2

4.2. STORAGE

The machine must be stored in a closed and dry place if not immediately installed in order to keep every part safe.

Relative humidity must be lower than 80% and the storage temperature must be between $3^{\circ}\text{C} \leq t \leq + 45^{\circ}\text{C}$.

4.3. HOW TO UNPACK THE MACHINE

- Cut the straps paying attention to the back spring.
- Remove clips that join pallet and carton;
- in case of plywood box, please remove clips from both sides and basis of each panel;
- Cut the strips that hold the machine.
- Lay the machine on the floor.

4.4 HANDLING THE UNPACKED MACHINE

- Check the machine and install the batteries if not already installed.
- For a brief transport of the machine, please disconnect the batteries cables and remove brushes; for a longer transport, please use the original package of the machine.

4.5. INSTALLATION



Installation must be carried out by authorized personnel after reading this manual..

4.5.1 BATTERIES INSTALLATION

Please follow the instructions below to install the batteries:

- the batteries room is under the operator's seat protected by a cover;
- lift the cover of the batteries room up (picture no. 4.4 detail 2);
- install the batteries in their room (picture 4.4 detail 2 and make sure the batteries boxes are not broken);
- do never add distilled water after batteries recharge;
- clean the surfaces for the cables connections;
- use the handles on the batteries to move them.

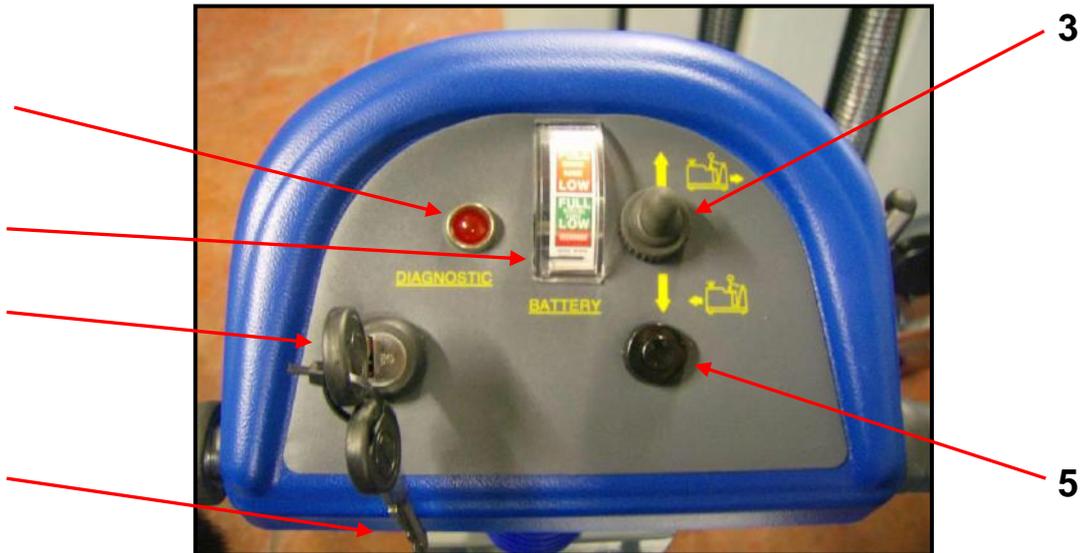


PICTURE N° 4.4

4.6. CONTROL DEVICES

4.6.1. DASHBOARD

The dashboard is made of a series of switches that activate or deactivate all the machine functions. The function of each switch is shown by a picture. Picture 4.6. shows the dashboard of the machine and the switches function is explained in the scheme in the following page.



PICTURE N° 4.6

POS.	IMAGE	FUNCTION
1		<u>SAFETY DIAGNOSTIC</u>
2		<u>KEY SWITCH</u>
3		<u>SELETTORE MARCIA AVANTI</u>
4		<u>BATTERY CHARGER INDICATOR</u>
5		<u>FILTER SHAKER</u>
6		<u>HORN</u>

4.7. FUNCTIONING

Switch the sweeper on and start both the side brush and the central one by means of the levers. Then start the suction engine which intake and collect the bitter into the recovery tank. Brushes start working by means of the accelerator lever. Drive the machine with a regular speed during the sweeping process.

Do always keep the suction engine clean from dust. As a consequence, the filter is always clean and can work properly. We suggest to start the filter shaker regularly by means of the switch on the dashboard (see § 4.6.1).



Before any operation, make sure that all protections are well fixed.

4.7.1 LEVERS AND PEDALS FUNCTIONING

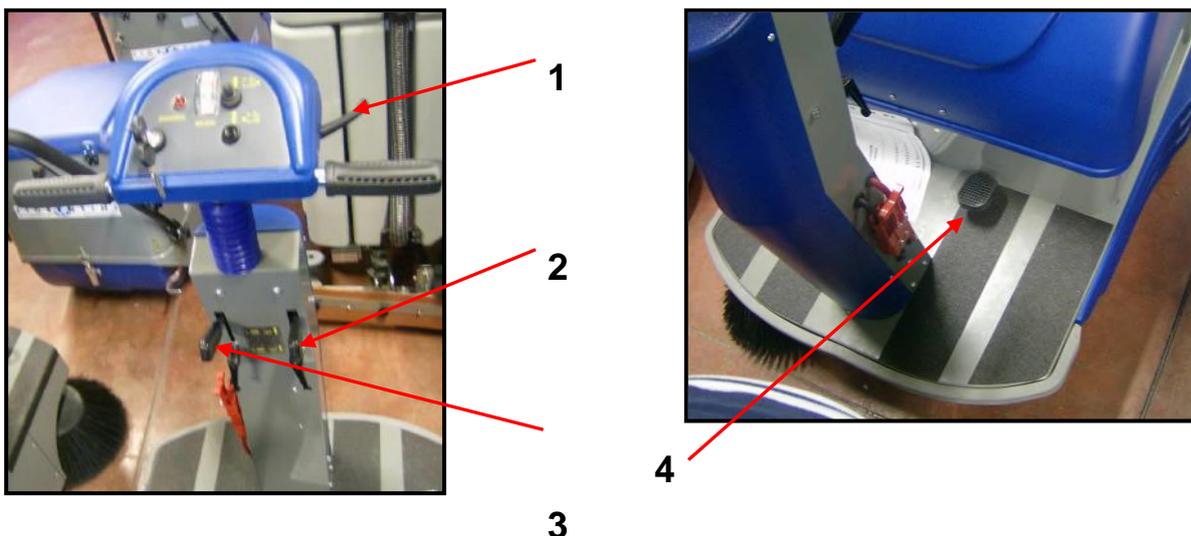
This machine is equipped with following levers:

- accelerator lever (picture 4.7 detail 1): select forward gear by means of the lever on the operator's right hand.



The accelerator lever starti all the mobile parts of the Minisweeper. Therefore, brushes work only after having started the lever.

- side brush lever (picture 4.7 detail 2): push the lever down and the side brush goes down onto the floor;
- central brush lever (picture 4.7 detail 3): push the lever down and the central brush goes down onto the floor;
- flap pedal (picture 4.7 detail 4): press the flap lever with the left foot and the flap is lifted up.

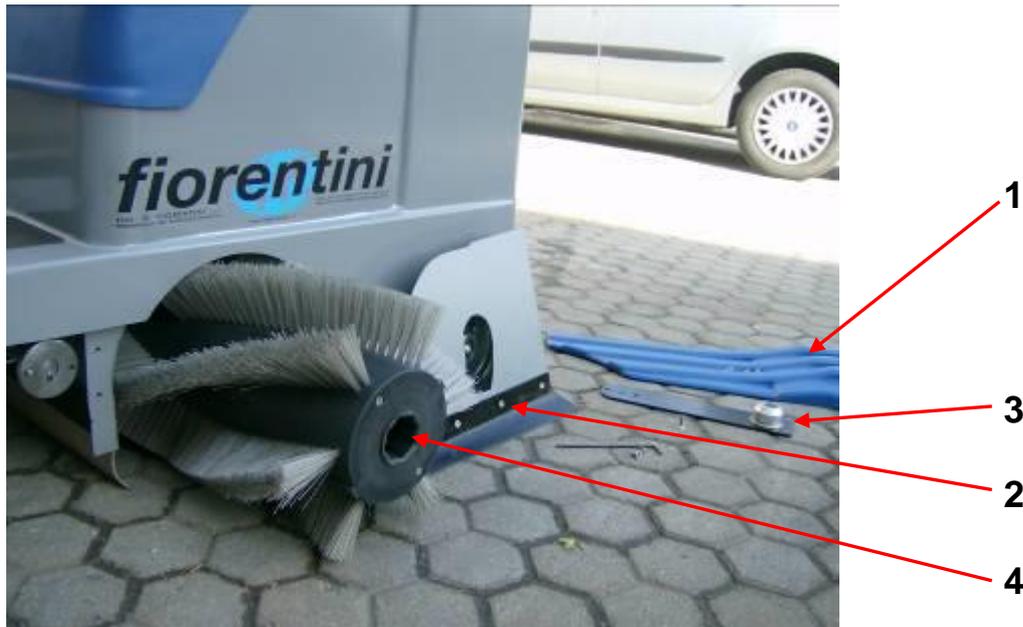


PICTURE N° 4.7

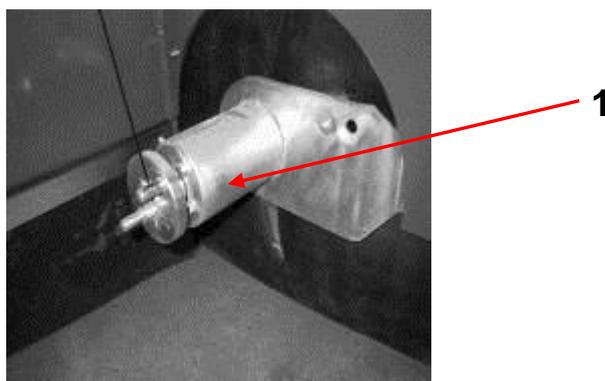
4.7.2 MAIN BRUSH REPLACEMENT

Please follow the following instructions in order to replace the main brush:

- remove the key from the dashboard in order to avoid that the machine starts;
- remove the plastic protection on the left side of the machine (picture 4.8 detail 1);
- remove the panel protection in order to reach the main brush (picture 4.8 detail 2);
- remove the the brush support (picture 4.8 detail 3);
- replace the brush (picture 4.9);
- follow now the opposite instruction in order to complete the main brush replacement..



PICTURE N° 4.8



PICTURE N° 4.9

4.7.3 SIDE BRUSH REPLACEMENT

Please follow the following instructions in order to replace the side brush:

- remove the key from the dashboard in order to avoid that the machine starts;
- stop the side brush as described in § 4.7.1;
- remove all the screws that fix the side brush (picture 4.10 detail 1);
- replace the side brush;
- do follow now the opposite instructions in order to complete the side brush replacement.

1**PICTURE N° 4.10****4.7.4 RECOVERY TANK EMPTYING**

Please follow the following instructions in order to empty the recovery tank:

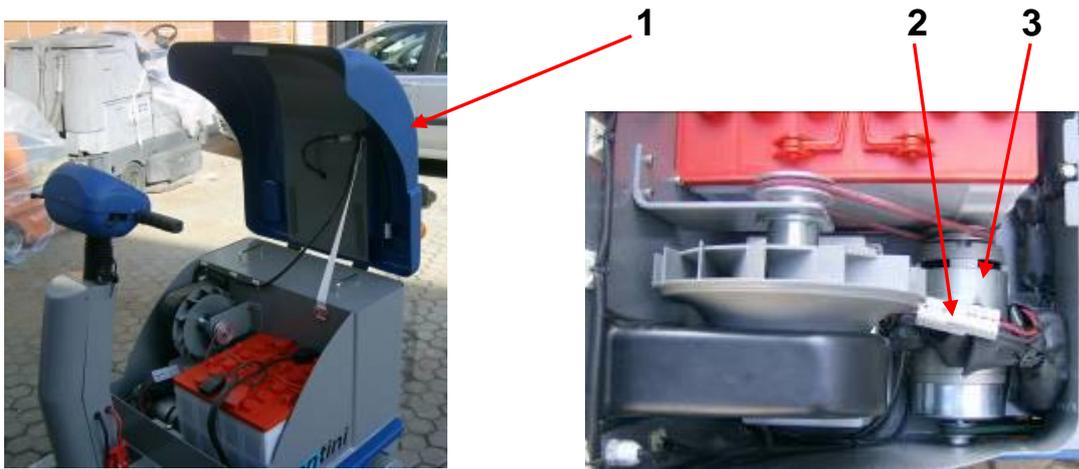
- remove the key from the dashboard in order to avoid that the machine starts;
- remove the hook that holds the recovery tank to the machine (picture 4.11 detail 1);
- remove the recovery tank and empty it;
- the operator can easily move the recovery tank thanks to the wheels (picture 4.12 detail 2);
- follow now the opposite instructions in order to complete the recovery tank emptying.

**1****2****PICTURE N° 4.11**

4.7.5 SUCTION ENGINE MAINTENANCE

The suction engine is an important component of the Minisweeper. This is why, the operator has regularly to check the efficiency of the engine (see § 5.4). Please follow the following instructions in order to reach the suction engine:

- remove the key from the dashboard in order to avoid that the machine starts;
- lift the protection cover of the batteries (picture 4.12 detail 1) to reach the suction engine;
- disconnect the plug (picture 4.12 detail 2) and remove the suction engine (detail 3);
- do the necessary maintenance;
- do now the opposite instructions in order to complete the suction engine maintenance.



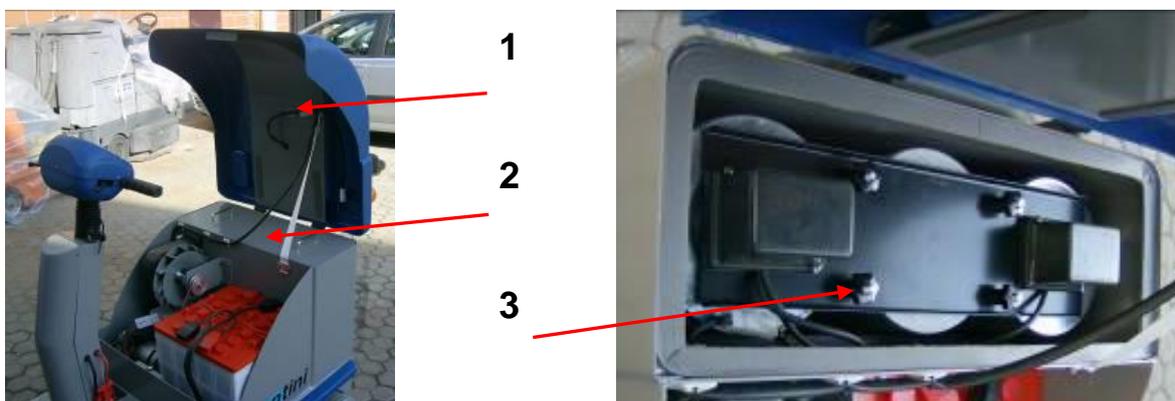
PICTURE N° 4.12

4.7.6 FILTER SHAKER ENGINE MAINTENANCE

The filter shaker engine remove dust from the filter in order to keep it always efficient. therefore, the engine has to be regularly operated so that the sweeper can work properly. By means of the button on the dashboard, the operator starts the filter shaker engine (see § 4.6.1).

Please follow the instructions below in order to maintain the filter shaker engine:

- remove the key from the dashboard in order to avoid that the machine starts;
- lift the protection cover of the batteries (picture 4.13 detail 1);
- remove the protection panel (detail 2);
- remove the four knobs (detail 3) and pull the engine out;
- the operator can now reach the filter and maintain it;
- do now the opposite instructions in order to complete the filter shaker engine maintenance.



5. MAINTENANCE

5.1. PERIODICAL MAINTENANCE

A periodical maintenance is very important.

Please write down in the format you find below all the interventions done on the machine.



- *Trained personnel only can service the machine and especially electric and electromechanical parts by means of suitable tools and equipments.*
- *Make reference to FIORENTINI S.p.A. only for service and spare parts.*

OPERATION	INTERVENTION	HOW OFTEN
Cleaning	Clean the recovery tank	Daily
	 <ul style="list-style-type: none"> • Do not use corrosive substances 	
Check up	➤ Check the suction pipes	Weekly
	➤ Check the rubber suction blades of the central brush room	Every 15 days
	➤ Check the battery water level	Every month
	➤ Check the suction engine	Every 3 months
	➤ Check and register the breaking system	Every 6 months
	➤ Check the connection of the battery cables	Every year
	➤ Check the brushes of each motor	Every year
➤ Check the safety devices	Every year	
➤ Check the electric system	Every year	

5.2 BATTERIES MAINTENANCE

The operator has to check the batteries charge when the machine is on duty by means of the indicator on the dashboard, which shows:

- Green light: charged battery
- Yellow light: slightly charged battery
- Red light: uncharged battery



The operator must keep the battery room open during the batteries recharge. Moreover:

- *It is forbidden to use flames and/or to smoke near the batteries;*
- *Pay attention to the battery acid;*
- *Do not develop sparks near the batteries;*
- *Pay attention to the batteries gazes, which can burst;*
- *Do not invert battery polarities.*

5.2.1 HYDROMETRY

In order to check the batteries hydrometry the operator has to follow the instructions below:

- By means of a hydrometre draw a small quantity of electrolyte so that the floater reaches the surface;
- Make sure that the floater inside the hydrometre is not blocked;
- For a new measurement, after having filled the batteries with distilled water, the operator has to wait until the liquid inside each battery becomes homogeneous.

5.2.2 WATER FILLING UP

- Fill distilled water up in each battery cell before the recharge. The liquid inside the batteries has to be of 6 mm. over the plates;
- The operator has to repeat the same operation every time the level decreases (every week).

5.2.3 CHARGE LIMITS

It is not necessary to recharge the batteries if the hydrometry, after a work day, is not under 1,24 (28 Bè). The highest suggested temperature is 45°C. If the electrolyte temperature increases more than 10/12 °C compared to the outside temperature, the batteries can be overcharged.

5.2.4 OFF DUTY OR INACTIVE BATTERIES

Inactive batteries loses their automatically their charge. If batteries do not continually work, the operator has to:

- Charge the batteries once a month with a 'final' stream intensity until gas is spread and the batteries voltage and weight are constant for 3-4 hours. This operation has to be done even if the absolute weight is high;
- Keep the batteries in a dry room.

5.2.5 BATTERIES DISPOSAL

Old batteries are toxic wastes and they have to be thrown in a suitable and authorized place for the batteries disposal. For a short storage, old batteries must be located in an authorized room. Moreover, they must be stored in sealed plastic tanks, whose capacity is not lower than the electrolyte.

5.3 ELECTRIC EQUIPMENT CONTROL

It is very important to check the electric system up every two years. Disconnected cables or burnt cables must be immediately replaced.



Interventions on the electric system must be carried out by a trained technician. Every kind of intervention not explained in the operator manual must be carried out by FIORENTINI's technicians.

5.4 TESTS TO BE CARRIED OUT

	HOW OFTEN	TECHNICIAN
CHECK		
Safety devices	2 years	Trained technician
Electric system	2 years	FIORENTINI technician
Braking system	3 months	Trained technician
Check up	5 years	FIORENTINI technician
MAINTENANCE		
Recovery tank	Daily	Operator
Suction filter	Daily	Operator
Suction pipes	Weekly	Operator
Batteries water level	Weekly	Operator
Batteries cables	6 months	Trained technician
Engines coal brushes	Every year	Trained technician

6. SERVICE

6.1. SERVICE ADDRESSES

Do not hesitate to contact FIORENTINI S.p.A. service for any kind of information or request.

ING. O. FIORENTINI S.p.A.

“THE BEST IN FLOOR MACHINES”

FILIALI:

20132 MILANO – Fax. 02/2592779

Via Palmanova 211/a – Tel. 02/27207783 - 2564810

00012 Guidonia Montecelio (ROMA) – Fax. (0774)353419 - 353314

Via B. Pontecorvo 20 – Tel. (0774)357184 - 353015

STABILIMENTO:

50030 PIANCALDOLI (FI) – Fax. 055/817144

Loc. Rombola – Tel. 055/8173610

Most of the technical problems can be sorted out with short intervention. This is why FIORENTINI S.p.A. suggest to read carefully this manual before using the machine. On the contrary, if the customer needs a FIORENTINI'S technician, please inform us about the problem in order to sort it out with the right material.

6.2 CLAIM REPORT

Please, fill in the format below if the machine shows particular problems.

Operator:

Company: _____

Operator's name: _____

Role: _____

Date: _____

Signature: _____

Machine description:Machine: MINISWEEPER

Type: _____

Purchase date: _____

S.N.: _____

Warranty: YES NO

Work hours: _____

Where does the machine
normally work? _____**Fault:**Code of the
defected
component: _____

Description: _____

Fault:

Fault short description:

- Mechanical component
- Wrong functioning
- Electric system
- Engine
- Missing component
- Extremely noisy
- Water leak
- Other

Customer's suggestion:

Mat. n.
Serial no. _____
Nr. de serie

Data di spedizione
Date of shipment _____
Date de spedition

Distributed by:

ING. O. FIORENTINI S.p.A.
“THE BEST IN FLOOR MACHINES”

FILIALI:

20132 MILANO – Fax. 02/2592779

Via Palmanova 211/a – Tel. 02/27207783 - 2564810

00012 Guidonia Montecelio (ROMA) – Fax. (0774)353419 - 353314

Via B. Pontecorvo 20 – Tel. (0774)357184 - 353015

STABILIMENTO:

50030 PIANCALDOLI (FI) – Fax. 055/817144

Loc. Rombola – Tel. 055/8173610