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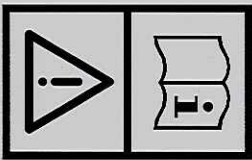
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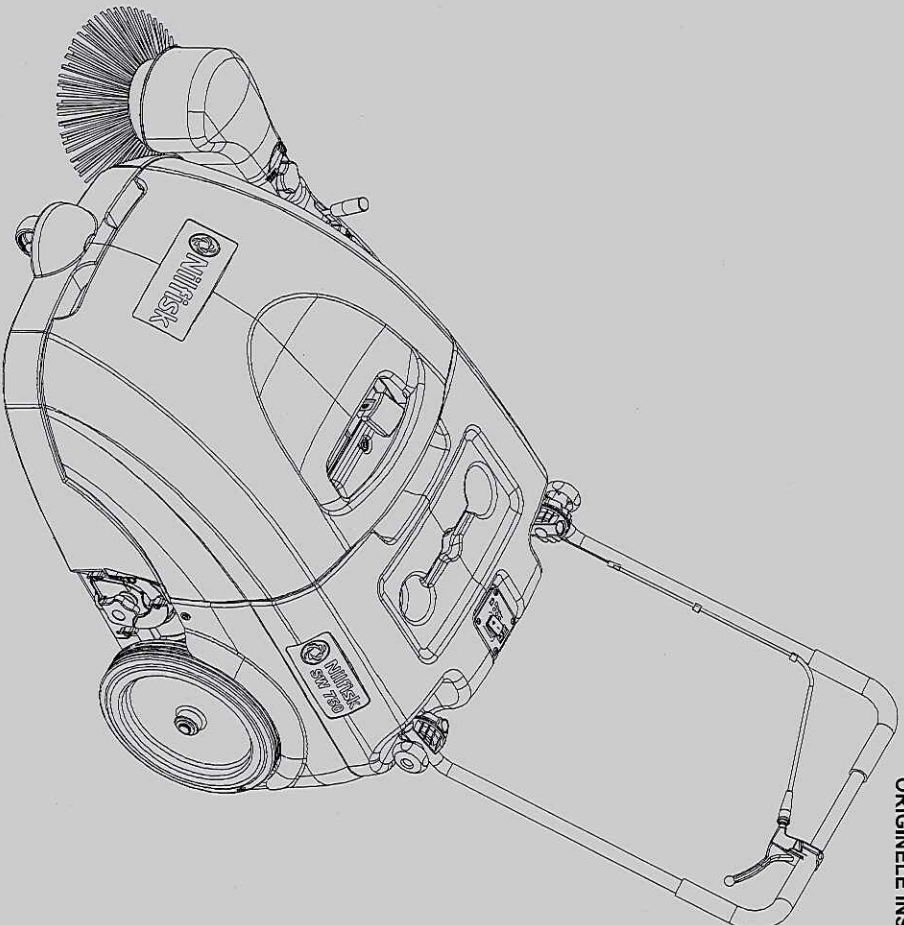
19 SIRIUS ROAD,
LANE COVE, N.S.W. 2003

Sweeper Walk Behind and Battery Operated

Plant No. 03 61 001



- BETRIEBSANLEITUNG **D**
ORIGINALANLEITUNG
- MANUEL D'UTILISATION **F**
INSTRUCTIONS D'ORIGINE
- USER MANUAL** **GB**
ORIGINAL INSTRUCTION
- GEBRUIKSAANWIJZING **NL**
ORIGINELE INSTRUCTIES



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INTRODUCTION



NOTE
The numbers in brackets refer to the components shown in Machine Description chapter.

MANUAL PURPOSE AND CONTENTS

The purpose of this Manual is to provide the operator with all necessary information to use the machine properly in a safe and autonomous way. It contains information about technical data, safety, operation, storage, maintenance, spare parts and disposal. Before performing any procedure on the machine, the operators and qualified technicians must read this Manual carefully. Contact Nilfisk in case of doubts regarding the interpretation of the instructions and for any further information.

TARGET

This Manual is intended for operators and technicians qualified to perform the machine maintenance. The operators must not perform procedures reserved for qualified technicians. Nilfisk will not be answerable for damages coming from the non-observance of this prohibition.

HOW TO KEEP THIS MANUAL

The User Manual must be kept near the machine, inside an adequate case, away from liquids and other substances that can cause damage to it.

DECLARATION OF CONFORMITY

The declaration of conformity, supplied with the machine, certifies the machine conformity with the law in force.



NOTE
Two copies of the original declaration of conformity are provided together with the machine documentation.

IDENTIFICATION DATA

The machine model and serial number are marked on the plate (33). The machine model/year is written in the declaration of conformity and it is also indicated by the first two figures of the machine serial number.

This information is useful when requiring machine spare parts. Use the following table to write down the machine identification data.

MACHINE model
MACHINE serial number

OTHER REFERENCE MANUALS

- Spare Parts List (supplied with the machine)
- Service Manual (that can be consulted at Nilfisk Service Centers)

SPARE PARTS AND MAINTENANCE

All necessary operating, maintenance and repair procedures must be performed by qualified personnel or by Nilfisk Service Centers. Only original spare parts and accessories must be used. Contact Nilfisk for service or to order spare parts and accessories, specifying the machine model and serial number.

CHANGES AND IMPROVEMENTS

Nilfisk constantly improves its products and reserves the right to make changes and improvements at its discretion without being obliged to apply such benefits to the machines that were previously sold. Any change and/or addition of accessories must be approved and performed by Nilfisk.

OPERATION CAPABILITIES

This sweeper has been designed and built to clean (by sweeping and vacuuming) smooth and solid floors, in civil and industrial environments and to collect dust and light debris under safe operation conditions by a qualified operator.

CONVENTIONS

Forward, backward, front, rear, left or right are intended with reference to the operator's position, that is to say with the hands on the handlebar (6).

UNPACKING/DELIVERY

Upon delivery check that the packing and the machine were not damaged during transportation. In case of visible damages, keep the packing and have it checked by the carrier that delivered it. Call the carrier immediately to fill in a damage claim.

Check that the machine is equipped with the following features:

- Technical documents:
 - Sweeper User Manual
 - Sweeper Spare Parts List
 - No. 1 vacuum system motor fuse

SAFETY

The following symbols indicate potentially dangerous situations. Always read this information carefully and take all necessary precautions to safeguard people and property.

The operator's cooperation is essential in order to prevent injury. No accident prevention program is effective without the total cooperation of the person responsible for the machine operation. Most of the accidents that may occur in a factory, while working or moving around, are caused by failure to comply with the simplest rules for exercising prudence. A careful and prudent operator is the best guarantee against accidents and is essential for successful completion of any prevention program.

SYMBOLS



DANGER!

It indicates a dangerous situation with risk of death for the operator.



WARNING!

It indicates a potential risk of injury for people.



CAUTION!

It indicates a caution or a remark related to important or useful functions.

Pay careful attention to the paragraphs marked by this symbol.



NOTE

It indicates a remark related to important or useful functions.



CONSULTATION

It indicates the necessity to refer to the User Manual before performing any procedure.

GENERAL INSTRUCTIONS

Specific warnings and cautions to inform about potential damages to people and machine are shown below.



DANGER!

- *Before performing any maintenance, cleaning or replacement procedure turn the main switch to "0" and, if necessary, disconnect the battery.*
 - *This machine must be used by properly trained operators only. Children or disabled people cannot use this machine.*
 - *Keep the battery away from sparks, flames and incandescent material.*
 - *Do not wear jewels when working near electrical components.*
 - *Do not work under the lifted machine without supporting it with safety stands.*
 - *Do not operate the machine near toxic, dangerous, flammable and/or explosive powders, liquids or vapours.*
- This machine is not suitable for collecting dangerous powders.*

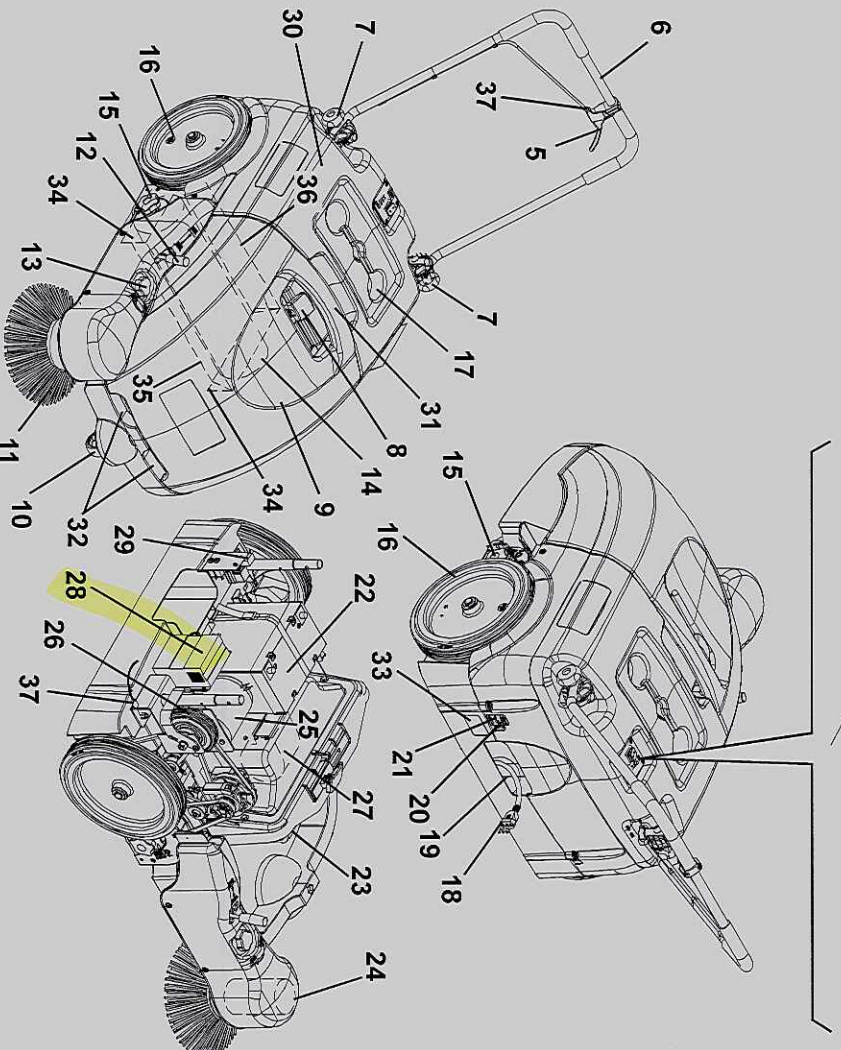
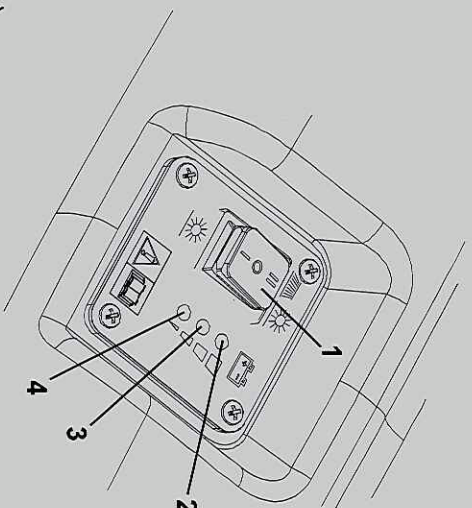
**WARNING!**

- Before using the battery charger, ensure that frequency and voltage values, shown on the machine serial number plate, match the electrical mains voltage.
- Do not pull or carry the machine by the battery charger cable and never use the battery charger cable as a handle. Do not close a door on the battery charger cable, or pull the battery charger cable around sharp edges or corners. Do not run the machine on the battery charger cable.
- Keep the battery charger cable away from heated surfaces.
- Do not charge the batteries if the battery charger cable or the plug are damaged. If the battery charger cable is damaged, contact Nilfisk Service Center.
- To reduce the risk of fire, electric shock, or injury, do not leave the machine unattended when it is plugged in. Before performing any maintenance procedure, disconnect the battery charger cable from the electrical mains.
- If the machine is not working as it should, has been damaged, left outdoors or dropped into water, return it to the Service Center.
- Do not smoke while charging the batteries.
- Do not leave the machine unattended without being sure that it cannot move independently.
- Always protect the machine against the sun, rain and bad weather, both under operation and inactivity condition. Store the machine indoors, in a dry place. This machine must be used in dry conditions, it must not be used or kept outdoors in wet conditions.
- Before using the machine, close all doors and/or covers.
- Do not use the machine in excessively dusty areas.
- Use only as shown in this Manual. Use only Nilfisk's recommended accessories.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.
- Do not wash the machine with direct or pressurised water jets, or with corrosive substances. Do not use compressed air to clean this type of machine.
- While using this machine, take care not to cause damage to other people, and children especially.
- Do not put any can containing fluids on the machine.
- The machine storage temperature must be between 0°C and +40°C.
- The machine working temperature must be between 0°C and +40°C.
- The humidity must be between 30% and 95%.
- Do not use the machine as a means of transport.
- Do not use the machine on slopes with a gradient exceeding the specifications.
- Do not allow the brooms to operate while the machine is stationary to avoid damaging the floor.
- In case of fire, possibly use a powder fire extinguisher, not a water one.
- Do not bump into shelves or scaffoldings, especially where there is a risk of falling objects.
- Adjust the operation speed to suit the floor conditions.
- This machine cannot be used on roads or public streets.
- Do not remove or modify the plates affixed to the machine.
- Do not tamper with the machine safety guards and follow the routine maintenance procedures scrupulously.
- Use only brooms supplied with the machine and those specified in the User Manual. Using other brooms could reduce safety.
- In case of machine malfunctions, ensure that these are not due to lack of maintenance. Otherwise, request assistance from the authorised personnel or from an authorised Service Center.
- Carefully read all the instructions before performing any maintenance/repair procedure.
- To ensure machine proper and safe operation, the scheduled maintenance shown in the relevant chapter of this Manual must be performed by the authorised personnel or by an authorised Service Center.
- If parts must be replaced, require ORIGINAL spare parts from an Authorised Dealer or Retailer.
- The machine must be disposed of properly, because of the presence of toxic-harmful materials (batteries, plastics, etc.), which are subject to standards that require disposal in special centres (see the Scrapping chapter).

MACHINE DESCRIPTION

MACHINE STRUCTURE AND CONTROLS

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Main switch: <ul style="list-style-type: none"> • when turned to "I" the vacuum system and main broom are turned on; • when turned to "II" the vacuum system, main broom and side broom are turned on. 2. Charged battery warning light (green) 3. Semi-discharged battery warning light (yellow) 4. Discharged battery warning light (red) 5. Drive control lever 6. Handlebar 7. Handlebar adjusting knobs 8. Filter shaker knob 9. Hopper 10. Front steering wheel 11. Side broom 12. Side broom lifting/lowering lever 13. Side broom height adjusting knob 14. Main broom 15. Main broom height adjusting knobs 16. Rear driving wheels 17. Can holder 18. Battery charger cable 19. Battery charger cable housing 20. Side broom motor circuit breaker 21. Main motor circuit breaker 22. Battery 23. Dust filter 24. Side broom motor 25. Main motor 26. Drive system gear 27. Vacuum fan 28. Battery charger | <ol style="list-style-type: none"> 29. Vacuum system motor lamellar fuse (7.5 A) 30. Hood 31. Hopper upper handle 32. Hopper lower handles 33. Serial number plate/technical data/conformity certification 34. Side skirts 35. Front skirt 36. Rear skirt 37. Drive belt adjuster |
|---|--|



ACCESSORIES/OPTIONS

In addition to the standard components, the machine can be equipped with the following accessories/options, according to the machine specific use:

1. Brooms of different materials
2. 80 Ah battery
3. Non-marking skirts

NOTE

For further information concerning the optional accessories, contact an authorised Retailer.

TECHNICAL DATA

General	Values
Cleaning width (without side broom)	500 mm
Cleaning width (with side broom)	720 mm
Machine size with folded handlebar and without side broom (length x width x height)	998 x 797 x 501 mm
Minimum distance from the floor (skirts not included)	25 mm
Main broom size (diameter x length)	200 x 500 mm
Side broom diameter	315 mm
Main broom speed	335 rpm
Side broom speed	100 rpm
Gradeability	2%
Hopper capacity	60 litres
Total machine weight (with standard battery)	68 kg
Front steering wheel size (diameter x length)	75 x 32 mm
Rear wheel size (diameter x length)	300 x 45 mm
Maximum drive speed	3.7 km/h
Sound pressure level at workstation (ISO 11201, ISO 4871) (LpA)	59.3 ±3 dB(A)
Machine output acoustic power (ISO 3744, ISO 4871) (LwA)	78 dB(A)
Vibration level at the operator's arms (ISO 5349-1)	< 2.5 m/s ²
Electrical components	Values
Electrical system voltage	12 V
Standard battery	GEL, 12 V, 45 Ah
Optional battery	GEL, 12 V, 80 Ah
Battery charger	6 A
Main motor	200 W, 1,500 rpm
Side broom motor	40 W
Vacuum system motor	70 W
Dust vacuuming and filtering	Values
Dust filter	5–10 µm (polyester)
Dust filter surface	1 m ²
Main broom compartment vacuum	12 mm H ₂ O

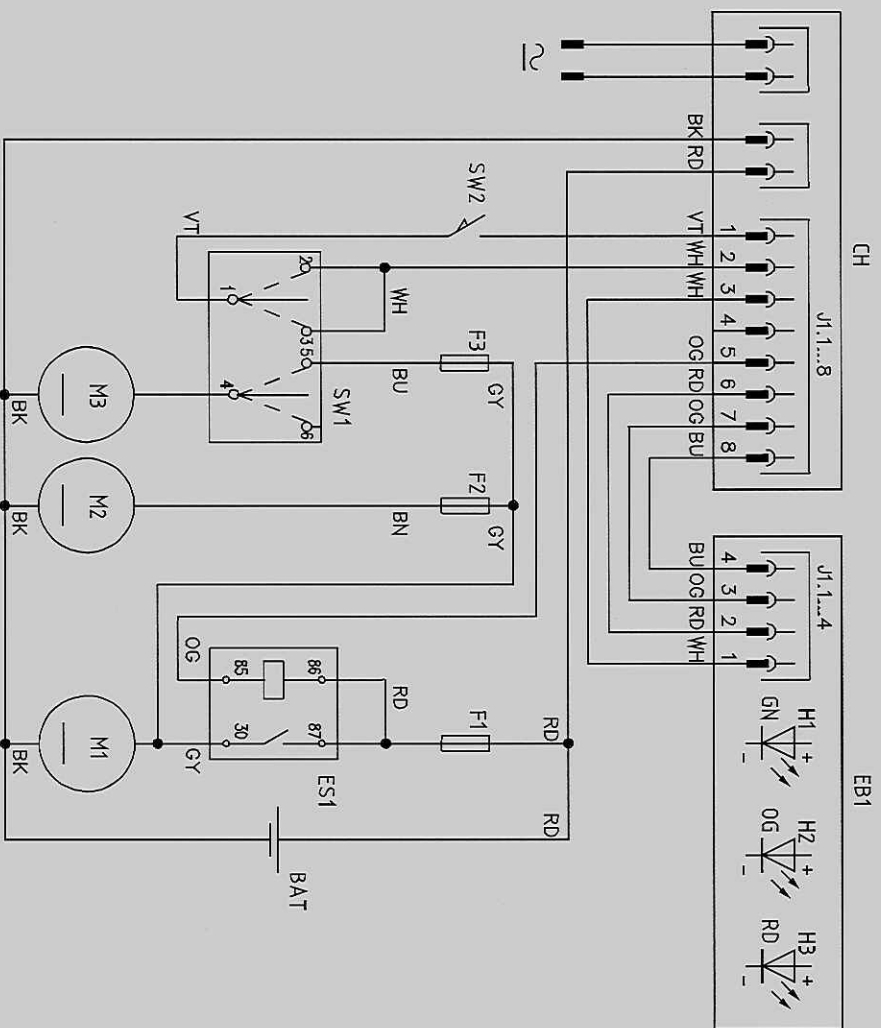
WIRING DIAGRAM

Key

BAT	Batteries
CH1	Battery charger
EB1	Electronic board LED
ES1	Relay
F1	Main fuse
F2	Vacuum fan fuse
F3	Side broom fuse
M1	Main motor
M2	Vacuum system motor
M3	Side broom motor
SW1	Main switch
SW2	Hopper microswitch

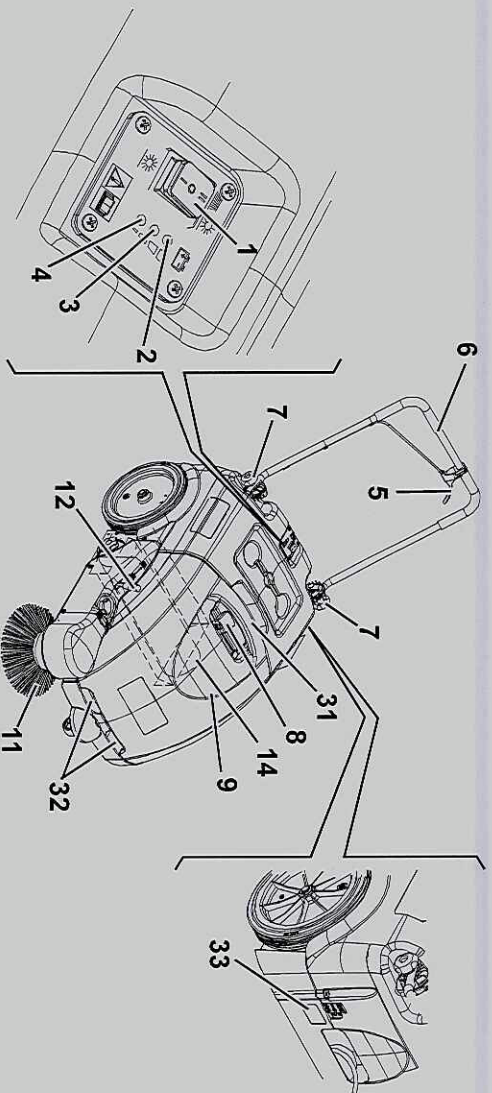
Colour code

BK	Black
BU	Blue
BN	Brown
GN	Green
GY	Grey
OG	Orange
PK	Pink
RD	Red
VT	Violet
WH	White
YE	Yellow



S311349

USE



S311348AB

WARNING!

On some points of the machine there are some adhesive plates indicating:

- DANGER
- WARNING
- CAUTION
- NOTE

While reading this Manual, the operator must pay careful attention to the symbols shown on the plates.

Do not cover these plates for any reason and immediately replace them if they are damaged.

BATTERY CHECK ON A NEW MACHINE

The machine is supplied with a standard 12 V, 45 Ah GEL battery (which does not require maintenance).

BEFORE STARTING THE MACHINE

1. Make sure that there are no open doors/hoods and that the machine is in normal operating conditions.
2. If the machine has not been used after being transported, check that all the blocks used for the transportation have been removed.
3. Check that side and main broom are installed, otherwise install them (see the procedure in Maintenance chapter).

STARTING AND STOPPING THE MACHINE**Starting the machine**

1. Adjust the handlebar (6) to reach a comfortable position, by loosening the knobs (7). When the adjustment is completed, tighten the knobs.
2. To use the main broom only (14), turn the main switch (1) to "I".
To use also the side broom (11), turn the main switch (1) to "II", then lower the side broom by disengaging the lever (12). Check that the green warning light (2) (charged battery) turns on.
If the yellow or red warning light (3 or 4) turns on, turn the main switch (1) back to "0" and charge the batteries (see the procedure in Maintenance chapter).

**NOTE**

The side broom (11) can be lifted and lowered even if it is turned on.

3. Start sweeping by grasping the handlebar (6) and pulling the drive control lever (5) gradually.

Stopping the machine

4. Release the drive control lever (5) to stop the drive system.
5. Turn off the vacuum system and the brooms, by turning the main switch (1) to "0".
6. Lift the side broom (11) by pulling the lever (12) backwards and by engaging it to the fastener.

MACHINE OPERATION

1. Avoid stopping for a long time with the machine in the same position and the brooms turning: this could create unwanted marks on the floor.
2. For machine proper operation, the dust filter must be as clean as possible. Therefore the filter shaker must be used at regular intervals (every 10 minutes, but this interval may vary according to the floor conditions), according to the following procedure.
 - Stop the machine and turn the main switch (1) to "0".
 - To shake the filter, move the filter shaker knob (8) to the right and then to the left several times.
 - Turn the main switch (1) to "I" or to "II" and start sweeping again.



NOTE
When the dust filter is clogged, the machine cannot collect dust and debris anymore.



CAUTION!
If the machine is to be used on wet floors, use it only for short intervals.

3. The hopper (9) should be emptied after each working cycle and whenever it is full.



NOTE
When the hopper is full, the machine cannot collect dust and debris anymore.

HOPPER EMPTYING

Stop the machine and turn the main switch (1) to "0".
Remove the hopper (9) by using the handles (31) and (32), then empty it at the waste collection centre.
Then install the hopper.
The machine is ready to start sweeping again.



NOTE
When the hopper is removed, all machine functions are disabled.

AFTER USING THE MACHINE

After working, before leaving the machine:

1. Turn the main switch (1) to "0".
2. Turn on the filter shaker with the knob (8).
3. Empty the hopper (9) (see the procedure in the previous paragraph).
4. Lift the side broom (11) by pulling the lever (12) backwards and by engaging it to the fastener.
5. Make sure that the machine cannot move independently.
6. Charge the batteries (see the procedure in Maintenance chapter).

MACHINE LONG INACTIVITY

If the machine is not going to be used for more than 30 days, proceed as follows:

1. Perform the daily maintenance procedures (see the Maintenance chapter).
2. Check that the machine storage area is dry and clean.
3. Slightly lift the machine so that the skirts, the main broom and the wheels do not touch the ground.

FIRST PERIOD OF USE

After the first 8 hours, check the machine fastening and connecting parts for proper tightening and check the visible parts for integrity and leakage.

MAINTENANCE

The lifespan of the machine and its maximum operating safety are ensured by proper and regular maintenance. The following table provides the scheduled maintenance. The intervals shown may vary according to particular working conditions, which are to be defined by the person in charge of the maintenance.

WARNING!



To perform maintenance procedures, the machine must be off and, if necessary, the batteries must be disconnected. Moreover, carefully read the instructions in Safety paragraph.

All scheduled or extraordinary maintenance procedures must be performed by qualified personnel, or by an authorised Service Center.

This Manual describes only the easiest and most common maintenance procedures.



NOTE

For other maintenance procedures shown in the Scheduled Maintenance Table, refer to the Service Manual that can be consulted at any Service Center.

SCHEDULED MAINTENANCE TABLE

Procedure	Every 10 hours	Every 50 hours	Every 200 hours	Every 400 hours
Battery charger cable check				
Side and main broom height check and adjustment				
Skirt height and operation check				
Dust filter cleaning and integrity check				
Hopper gasket check				
Filter shaker operation check				
Driving belt and clutch visual inspection				
Driving belt tensioner adjustment				
Nut and screw tightening check				
Motor carbon brush check or replacement				

(*) For the relevant procedure, see the Service Manual.

(1) And after the first 8 hours.

BATTERY CHARGER CABLE CHECK

Carefully check the battery charger cable (18) and the relevant plug for wear, cuts, cracks or other damages. If the battery charger cable or the relevant plug is damaged, contact the Nilfisk Service Center.

SIDE BROOM HEIGHT CHECK AND ADJUSTMENT

1. Check the side broom distance from the floor as shown below:
 - Drive the machine on a level ground and lower the side broom.
 - Keep the machine stationary and turn on the side broom for a few seconds.
 - Turn off the side broom by pressing the switch (1), then lift it and move the machine.
 - Check that the side broom print is as shown in the figure (A, Fig. 1): the side broom must touch the ground along a circle arc ranging from "10 o'clock" position to "3 o'clock" position.
 - If the print is not within specifications, adjust the broom height as shown in step 2.
2. Turn the knob (13) clockwise and counter-clockwise to adjust the broom height.
3. Perform step 1 again to check the proper adjustment of the side broom height.
4. When the broom is too worn to be adjusted, replace it as shown in the next paragraph.

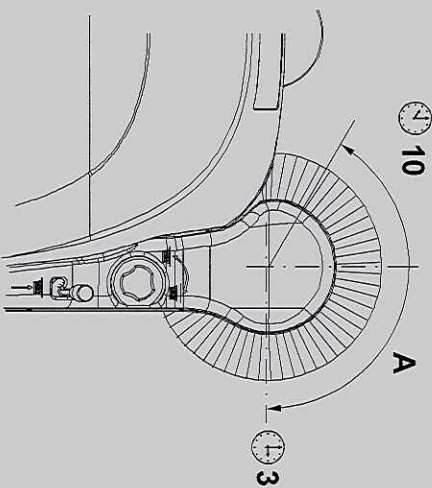


Figure 1

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SIDE BROOM DISASSEMBLY/ASSEMBLY

CAUTION!

It is advisable to wear protective gloves when replacing the side broom because there can be sharp debris between the bristles.

1. Drive the machine on a level floor.
2. Turn the main switch (1) to "0".
3. Lift the side broom.
4. Loosen the knob (A, Fig. 2) inside the side broom, then remove the broom (B) by disengaging it from the pins (C).
5. Install the new broom by engaging it on the pins (C), then tighten the knob (A).
6. Adjust the new broom height as shown in the previous paragraph.

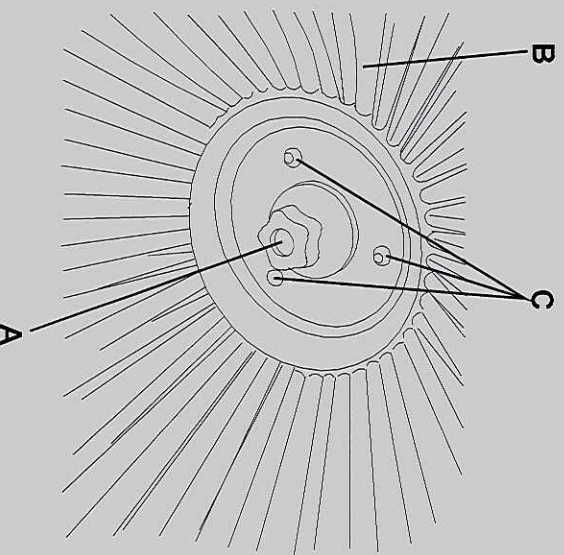


Figure 2

S311351

MAIN BROOM HEIGHT CHECK AND ADJUSTMENT

1. Check the main broom distance from the floor as shown below:
 - Drive the machine on a level floor.
 - Keep the machine stationary and turn on the main broom for a few seconds.
 - Turn off the main broom by pressing the switch (1), then move the machine.
 - Check that the main broom print (A, Fig. 3), along its length, is 3-5 cm wide.
 - If the print is not within specifications, adjust the broom height as shown in step 2.
2. Turn the main switch (1) to "0".
3. Loosen the knob (A, Fig. 4) on both sides of the machine.
4. Grasp the support (B) on the points (C) and move it upwards, then lift it or lower it to change the main broom height. For height variation, refer to the indicator (D). Then tighten the knob (A) on both sides of the machine.
5. Perform step 1 again to check the proper adjustment of the main broom height.
6. When the broom is too worn to be adjusted, replace it as shown in the next paragraph.

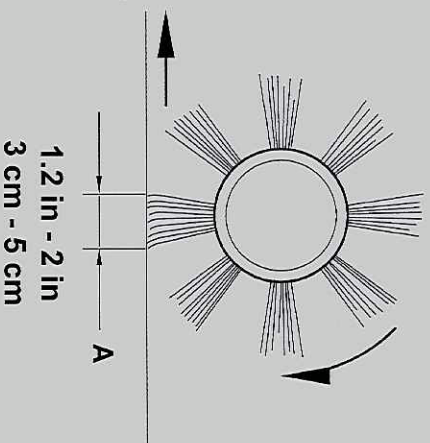


Figure 3

S311352



CAUTION!
*If the main broom print is excessive (larger than 5 cm), the machine regular operation is affected and the moving or electrical parts can overheat, thus reducing machine life.
 Pay careful attention when performing the above-mentioned checks, and always use the machine according to the indicated conditions.*

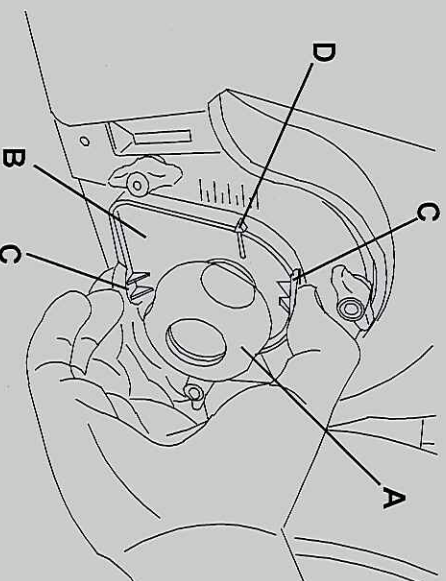


Figure 4

S311353

MAIN BROOM DISASSEMBLY/ASSEMBLY



CAUTION!
It is advisable to wear protective gloves when replacing the main broom because there can be sharp debris between the bristles.

1. Drive the machine on a level floor.
2. Turn the main switch (1) to "0".
3. Remove the hopper (9).
4. Loosen the handwheels (A, Fig. 5) completely on the left side of the machine.
5. Remove the lid (A, Fig. 6) by grasping it on the points (B), Grasp the main broom (A, Fig. 7) on the points (B) and (C), then disconnect it from the drive hub (D) by pulling it in the direction shown by the arrow (E); then remove it in the direction shown by the arrow (F).
7. The new main broom must be installed with the bristles rows bent as shown in the figure.
8. Install the new broom by performing steps 3 to 6 in the reverse order.
9. Adjust the new broom height as shown in the previous paragraph.

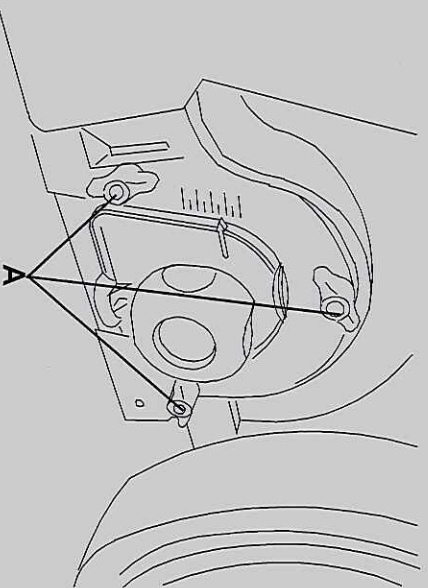


Figure 5

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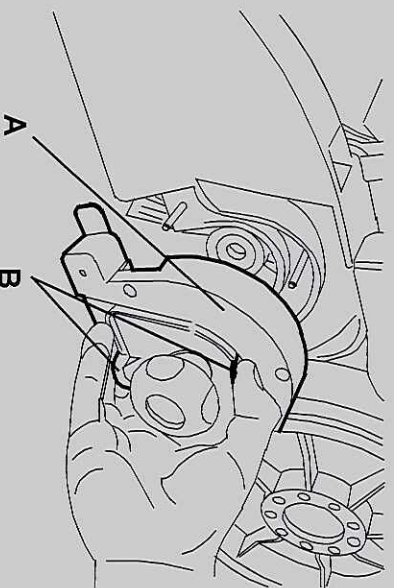


Figure 6

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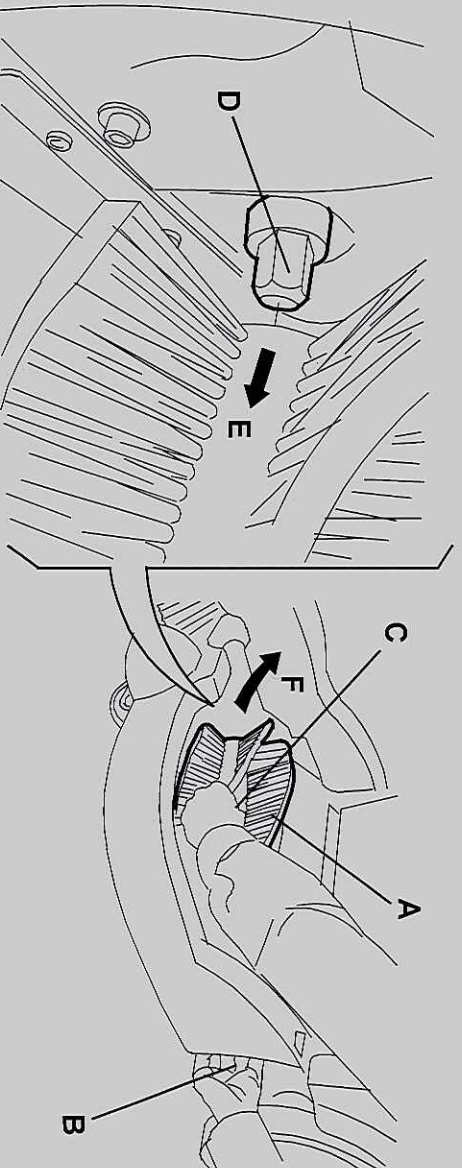


Figure 7

S311356

DUST FILTER CLEANING AND INTEGRITY CHECK, HOPPER GASKET CHECK

1. Drive the machine on a level floor.
2. Turn the main switch (1) to "0".
3. Remove the hopper (9).
4. Loosen the knobs (A, Fig. 8).
5. Grasp the dust filter (B) as shown in the figure.
6. Remove the dust filter by turning it in the direction shown by the arrow (A, Fig. 9) to disengage it from the pins (B), then lower the filter to disengage it from the filter shaker combs (C).
7. Remove the filter (A, Fig. 10) from the frame (B) by disengaging the 2 rubber bands (C).
8. In an appropriate outdoor area, clean the filter by shaking it on a level and clean surface, tapping the side (D) opposite to the gasket (E).
9. Complete the cleaning procedure by using compressed air (F) at maximum 6 Bar, blowing only from the side of the gasket (E), at a minimum distance of 30 cm. Check the filter body for tears. If necessary, replace it. For a better cleaning, it is allowed to wash the filter with water and non-lathering detergents. This provides better quality cleaning but reduces the life of the filter, which will have to be replaced more frequently. The use of inadequate detergents can damage the filter.
10. Clean the bearing surface of the filter rubber gasket (E) and check it for integrity and sealing capabilities. If necessary, replace the filter.
11. Clean the bearing surface of the hopper gasket (D, Fig. 9) and check it for integrity and sealing capabilities. If necessary, replace it.
11. Assemble the components in the reverse order of disassembly.



NOTE
Assemble the filter with the gasket (E, Fig. 10) positioned as shown in the figure.

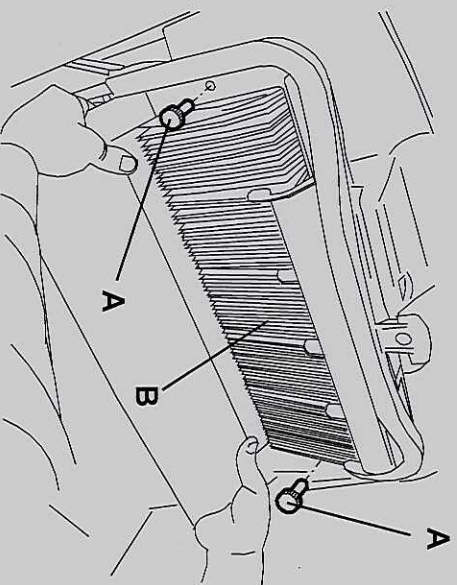


Figure 8

S311357

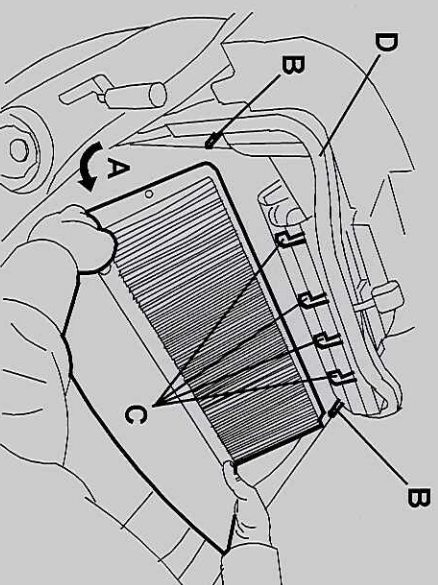


Figure 9

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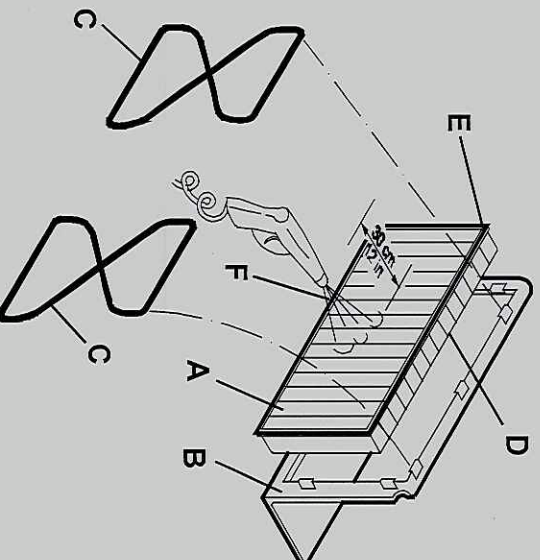


Figure 10

S311359

SKIRT HEIGHT AND OPERATION CHECK

1. Drive the machine on a level floor that is suitable for checking the skirt height.
2. Turn the main switch (1) to "0".
3. Check that the distance from the ground of the side skirts (A and B, Fig. 11) is 0 - 2 mm.
Check the skirts for integrity, cuts or tears, which can reduce the machine vacuum capabilities. If necessary replace the machine vacuum capabilities. If necessary replace the side skirts (see the procedure in the Service Manual).
4. Check that the front and rear skirts (C and D, Fig. 11) slightly rub on the ground. Check the skirts for integrity, cuts or tears, which can reduce the machine vacuum capabilities. Note that the front skirt has typical vertical cuts (E). If necessary replace the front and rear skirts (see the procedure in the Service Manual).

BATTERY CHARGING

1. Drive the machine to the appointed recharging area and ensure that it cannot move independently.
2. Turn the main switch (A, Fig. 12) to "0".
3. Remove the battery charger cable (B) from the housing (C) and connect it to the electrical mains.



CAUTION!
Before connecting the battery charger (B), ensure that frequency and voltage values, shown on the machine serial number plate (33), match the electrical mains voltage.
In case of doubt, do not connect the plug to the electrical mains, but contact the qualified personnel.

4. While charging the batteries, the red warning light (D) and the yellow warning light (E) turn on in sequence. When the green warning light (F) turns on, the batteries are charged.
5. Disconnect the battery charger cable (B) from the electrical mains and place it in the housing (C).



NOTE
When the battery charger is connected to the electrical mains, all machine functions are automatically disabled.

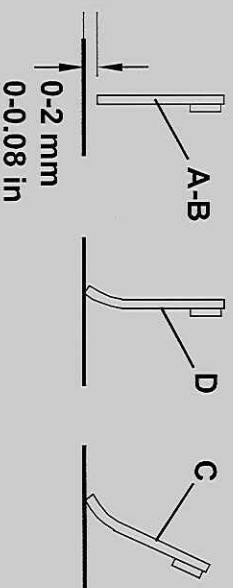
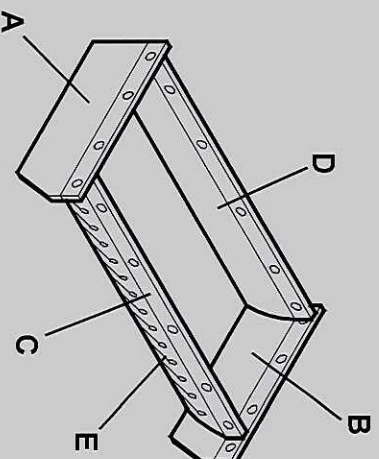


Figure 11

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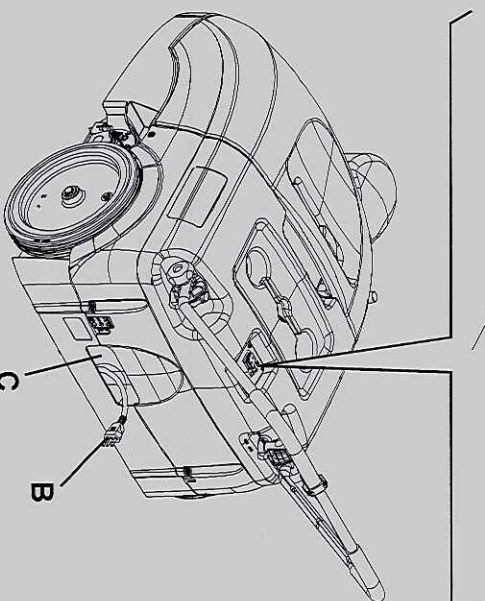
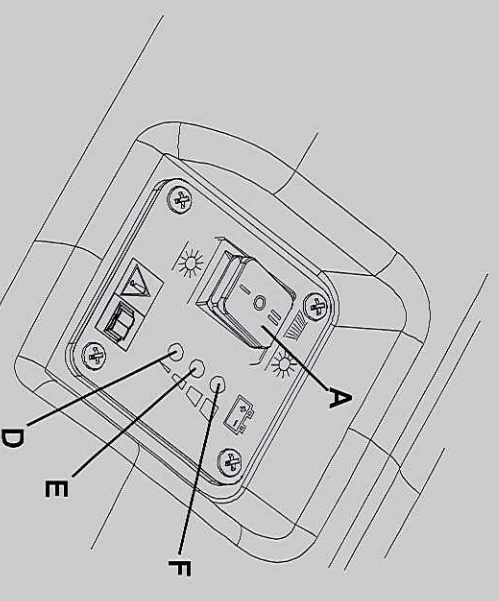


Figure 12

S311361

TROUBLESHOOTING

Trouble	Possible cause	Remedy
The machine does not start when turning the main switch to "I" or to "II".	There is an open in the fuse (21).	Reset the fuse by pressing the relevant push-button.
	The battery charger cable is connected to the electrical mains.	Disconnect it and place it in the housing.
The side broom does not operate.	The batteries are discharged.	Charge the batteries.
	There is an open in the fuse (20).	Reset the fuse by pressing the relevant push-button.
The machine operates only when stationary, otherwise the red warning light turns on.	The batteries are discharged.	Charge the batteries. If the trouble persists, have the batteries replaced at Nilfisk Service Center.
The battery autonomy is low.	The batteries are dead.	Have the batteries replaced at Nilfisk Service Center.
The batteries do not charge: the red warning light (4) does not turn on when the plug is inserted in the electrical mains socket.	There is no power supply at the electrical mains socket.	Check the electrical mains socket by trying to connect another domestic appliance.

For further information, refer to the Service Manual, available at any Nilfisk Service Center.

SCRAPPING

Have the machine scrapped by a qualified scrapper.

Before scrapping the machine, remove and separate the following materials, which must be disposed of properly according to the

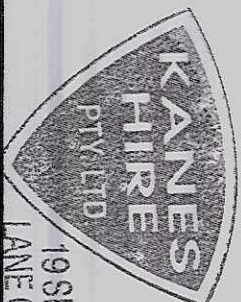
Law in force:

- Battery
- Brooms
- Plastic hoses and components
- Electrical and electronic components (*)

(*) Refer to the nearest Nilfisk Center especially when scrapping electrical and electronic components.

0861061

Sweeper



19 SIRIUS ROAD,
LANE COVE, N.S.W. 2066

CBHD1 ● CBHD2 ● CBHD3 ● HF1-IP

ELECTRONIC BATTERY CHARGER
ELEKTRONISCHES LADEGERÄT
CARICA BATTERIE ELETRONICO
CHARGEUR DE BATTERIE ELECTRONIQUE
CARGADOR DE BATERÍAS ELECTRÓNICO

OPERATING MANUAL
BENUTZER-HANDBUCH
MANUALE OPERATIVO
MANUEL D'USAGE
MANUAL OPERATIVO



Attention: read carefully the operating manual before using the battery charger.



Achtung: Bitte lesen Sie das Benutzerhandbuch mit Aufmerksamkeit, bevor Sie das Ladegerät benutzen.



Attenzione: leggere attentamente il manuale operativo prima di utilizzare il carica batterie.



Attention: lire attentivement le manuel d'usage avant d'utiliser le chargeur de batterie.



Atención: leer atentamente el manual de instrucciones antes de utilizar el cargador de baterías.

Model Modelli Modèle Modelo	Voltage Spannung Tensione Tensión	Current Strom Corrente Courrant Corriente	Charging Curve Ladekurve Curva di Carica Courbe de Charge Curva de Carga				OTHER ANDERES ALTRO AUTRE OTROS
			IUIa ACD	IUIa GEL	IUIa AGM	IUIo GEL	
CBHD1	12V	2A					
CBHD1	12V	4A					
CBHD1	12V	5A					
CBHD1	12V	6A					
CBHD1	12V	8A					
CBHD1	12V	9A					
CBHD1	12V	10A					
CBHD1	12V	11A					
CBHD1	24V	2A					
CBHD1	24V	4A					
CBHD1	24V	5A					
CBHD1	24V	6A					
CBHD1	24V	8A					
CBHD1	24V	9A					
CBHD1	24V	10A					
CBHD1	24V	11A					
CBHD1	36V	2A					
CBHD1	36V	6A					
CBHD2	12V	13A					
CBHD2	12V	15A					
CBHD2	12V	18A					
CBHD2	12V	20A					
CBHD2	24V	13A					
CBHD2	24V	15A					
CBHD2	24V	18A					
CBHD2	24V	20A					

**BATTERY CHARGER IDENTIFICATION LABEL
 ETICHETTA IDENTIFICATIVA DEL CARICABATTERIA
 TYPENSCHILD DES BATTERIE-LADEGERÄTES
 ÉTIQUETTE D'IDENTIFICATION DU CHARGEUR DE BATTERIE
 ETIQUETA DE IDENTIFICACIÓN DEL CARGADOR DE BATERIA**

S.P.E. ELETTRONICA INDUSTRIALE		L		CE	
GREVALCORE (BO) ITALY					
Mod.	A	Ser.	B	Dat.	C
Input:	D	Max input current			
Output:	E	Fuse:	F	Batt.	
Charging curve:	G	Batt. I			

A	MODEL	MODELL	MODELLO	MODELE	MODELO
B	BATTERY CHARGER SERIAL NUMBER	SERIENNUMMER DES BATTERIE-LADEGERÄTES	NUMERO DI SERIE DEL CARICABATTERIA	NUMÉRO DE SERIE DU CHARGEUR DE BATTERIE	NUMERO DE SERIE DEL CARGADOR
C	BATTERY CHARGER MANUFACTURE DATE	HERSTELLUNGSDATUM DES BATTERIE-LADEGERÄTES	DATA FABBRICAZIONE DEL CARICABATTERIA	DATE DE FABRICATION DU CHARGEUR DE BATTERIE	FECHA DE FABRICACIÓN DEL CARGADOR
D	INPUT VOLTAGE	VERSORGUNGSSPANNUNG	TENSIONE DI ALIMENTAZIONE	TENSION D'ALIMENTATION	TENSIÓN DE ALIMENTACIÓN
E	OUTPUT VOLTAGE AND CURRENT	AUSGANGSSPANNUNG UND STROM	TENSIONE E CORRENTE DI USCITA	TENSION ET COURANT DE SORTIE	TENSIÓN Y CORRIENTE DE SALIDA
F	MAINS FUSE VALUE	WERT NETZ-SICHERUNG	VALORE FUSIBILE DI RETE	VALEUR FUSIBLE DE RÉSEAU	VALOR FUSIBLE DE RED
G	CHARGING CURVE	LADEKURVE	CURVA DI CARICA	COURBE DE CHARGE	CURVA DE CARGA
H	MAINS ABSORPTION	NETZ-STROMAUFNAHME	ASSORBIMENTO DI RETE	ABSORPTION DE RÉSEAU	ABSORCIÓN DE RED
I	BATTERY CAPACITY RANGE	BEREICH BATTERIELEISTUNG	GAMMA CAPACITA' BATTERIE	GAMME CAPACITÉ DES BATTERIES	GAMA DE CAPACIDAD BATERIAS
L	PRODUCT CERTIFICATION STAMPS	KENNZEICHNUNG PRODUKTZERTIFIZIERUNG	MARCHI CERTIFICAZIONE DI PRODOTTO	MARQUES DE CERTIFICATION DE PRODUIT	MARCAS DE CERTIFICACIÓN DEL PRODUCTO

Important safety instruction. Keep these instructions. This manual contains important instructions for the safety of the user and operation of the device.

GENERAL WARNINGS

- 1) Before each use of the battery charger the instructions set out below must be carefully read and abided by.
- 2) The failure to follow these instructions and /or errors in installing or using the battery charger, could lead to endangering the operator and /or damaging the device, voiding the manufacturer's guarantee.
- 3) The battery charger cannot be used as a component in systems which provide life support and/or medical devices, without explicit written authorisation from S.P.E. ELETRONICA INDUSTRIALE.
- 4) The battery charger must not be used by persons with reduced physical, sensory and mental capabilities or with lack of experience and/or knowledge, unless they are properly supervised and instructed by a person responsible for their safety.

CHILDREN

- 5) The battery charger must not be used by children. The battery charger is not a toy and must not be treated as such.

WHERE TO INSTALL

- 6) Never place the battery charger in the immediate vicinity of the battery in order to prevent gases produced and/or emitted by the actual battery during charging corroding and/or damaging the battery charger. Place the battery charger as far away from the battery as the length of cables permits.
- 7) Do not install the battery charger in a closed space or in such a way as to somehow prevent ventilation. For units equipped with fans, at least 30 mm clearance must be left around the vents. In order to facilitate the heat exchange of the battery charger it must be positioned vertically, exploiting the fixture holes (where provided).
- 8) Do not use the battery charger outdoors.
- 9) Do not expose the battery charger to rain, water splashes or steam.
- 10) Do not install the battery charger in caravans and / or similar vehicles.
- 11) Do not install the battery charger near any heat sources or in areas with high concentrations of dust.
- 12) Do not install the battery charger near any potential sources of flammable material, for example methane gas pipes or fuel depots (petrol, kerosene, ...).
- 13) Do not place and/or fit the battery charger onto surfaces manufactured out of combustible materials, like wooden shelves or walls.

BATTERIES

- 14) Follow the specific safety instructions provided by the battery manufacturer carefully, for example, whether or not to remove cell caps during charging and the recommended charge rates.
- 15) Working in the vicinity of a lead-acid battery is dangerous, as batteries generate explosives gases during charging. Therefore smoking and/or generating open flames and/or sparks must be avoided.
- 16) Never charge a frozen battery.
- 17) Batteries must be charged in specific, well-ventilated areas.
- 18) In order to reduce risk of injury only charge Lead-Acid, GEL or AGM type, Lithium Polymer or Lithium Ion batteries. Do not charge other types of rechargeable or non-rechargeable batteries as they could explode causing damage and/or injury.

FURTHER SPECIFICATIONS FOR LITHIUM BATTERIES

- 19) In order to charge Lithium Polymer and Lithium Ion batteries, a BMS (Battery Management System) must always be used, comprising an active and passive safety system, in compliance with safety regulations in force.
- 20) The possibility of the BMS acting directly on the battery charger operation during cell balancing phases rules out, for any reason whatsoever, that the battery charger is held directly responsible should damage caused to the battery, or even a fire or an explosion, be due to an error in the BMS software.
- 21) The faculty offered by the materials produced by S.P.E. ELETRONICA INDUSTRIALE to select different levels of voltage for charging, is entrusted to the control and supervision of the end user and S.P.E. ELETRONICA INDUSTRIALE is not liable for any consequences resulting from the selection of the incorrect level of voltage. If in doubt, the user should ask a qualified professional for clarification.

22) The battery charger tolerance thresholds, as far as levels of over-voltage and overcharging are concerned, are used only for the safeguarding of the systems of the same and have no safety functions for the battery itself, the safety of which depends solely on the BMS, even when the battery charger is connected to the battery, whether the latter is being charged or not.

23) Should the client want to use the battery charger on a specific on-board system and in general in any cases of special usage, it is the client's responsibility to inform S.P.E. ELETRONICA INDUSTRIALE, so that the latter can draw up any necessary recommendations. In this case, the client must provide S.P.E. ELETRONICA INDUSTRIALE with all designs, diagrams and descriptive material necessary. S.P.E. ELETRONICA INDUSTRIALE cannot be held responsible for any damage resulting from the use of the battery charger after opening it and/or modifying it and/or inserting it into other systems.

24) Under no circumstances can S.P.E. ELETRONICA INDUSTRIALE be held responsible for the malfunctioning of the batteries or the incineration/explosion of these, in so much as the safety of the battery is the task of the BMS and not of the battery charger.

CHECKING CABLES, GRID, EARTHING

- 25) Do not transport the battery charger by pulling on the cables as they could be damaged. Use the handles, if provided.
- 26) Before using the battery charger, check that the sleeving on the mains cable and battery cables is in good condition. Should one of the cables be damaged, have it replaced by a S.P.E. ELETRONICA INDUSTRIALE qualified technician.
- 27) Check that the input voltage of the battery charger given on the data plate is in line with the voltage available.
- 28) Check the compatibility of the mains plug supplied with the battery charger: the use of adaptors is not recommended (in Canada it is against the law).
- 29) The battery charger must be plugged into a socket fitted with an earth wire. Should the socket not be equipped with an earth connection, do not use the device before having a suitable socket installed by a qualified technician.
- 30) The power socket to which the battery charger is to be connected must be protected by an electrical device by law (fuse and/or automatic cut-out), capable of absorbing an electrical current equalling the absorption of current stated on the matriculation number of the battery charger, increased by 10%.
- 31) Do not open the battery charger as there are no parts which can be serviced and/or replaced by the user. Only specialised personnel, authorised by S.P.E. ELETRONICA INDUSTRIALE may carry out servicing which involves opening the actual device. Electrical/electronic components inside may cause electric shocks even if the device is not plugged in.

CHECKING BATTERY CHARGER OPERATION and CURVE

- 32) Before charging, make sure that the battery charger is in line with the voltage of the battery, that the charging current suits the capacity of the battery and that the selected charging curve (for lead-acid batteries, or for airtight GEL or AGM type batteries, Lithium Polymer or Lithium Ion batteries) is correct for the type of battery to be charged.
- 33) We recommend fitting a fuse between battery charger and battery. The fuse must be installed along the connection to the positive terminal of the battery. The rating of the fuse must be proportionate to the nominal output current of the battery charger, the diameter of cable used and the environment in which it is to be installed.
- 34) We recommend unplugging it from the mains supply before connecting and disconnecting batteries.
- 35) During normal operation of the battery charger, the external surface may become hot and may remain so for a certain period of time after it has been switched off.
- 36) The battery charger needs no special maintenance, only regular cleaning procedures, to be carried out according to the type of working environment. Cleaning procedures should only be carried out on the external surface of the battery charger. Before starting any cleaning procedures, the mains supply cable and battery cables must be unplugged. Do NOT use water and/or detergents in general and/or pressure washers of any kind when carrying out cleaning.

LACK OF USE

- 37) If safe operation of the battery charger can no longer be ensured, stop the device and ensure that it cannot be put back into operation.
- 38) The specifications set out in this manual are subject to change without any notice. This publication replaces any previously supplied information.

ELECTRONIC BATTERY CHARGER OPERATING MANUAL

TECHNICAL FEATURES OF THE CBHD1 - CBHD2 - CBHD3 - HF1-IP

The innovative characteristics of the CBHD1 - CBHD2 - CBHD3 - HF1-IP range of battery chargers are the following:

1. Advanced technology **High frequency** system.
2. Charging process fully controlled by microprocessor.
3. Universal Input voltage: 100-240 Vac
4. Charging process start in the "soft-start" mode.
5. Available on request automatic Reset on insertion of a new battery and automatic charge cycle start.
6. Protection against polarity inversions, short-circuits, over-voltages or anomalies by means of an output relay.
7. Battery to battery charger connection without sparks on the output terminals with obvious advantages for the active safety, thanks to the recognition of the battery voltage downstream the normally open output relay.
8. Signaling of possible anomalies by red LED flashing.
9. Insensitive charge parameters in case of $\pm 10\%$ network voltage oscillations.
10. Efficiency $> 85\%$.
11. Output ripple at maximum charge lower than 100mV.
12. Start of the charge cycle even with 2V batteries.

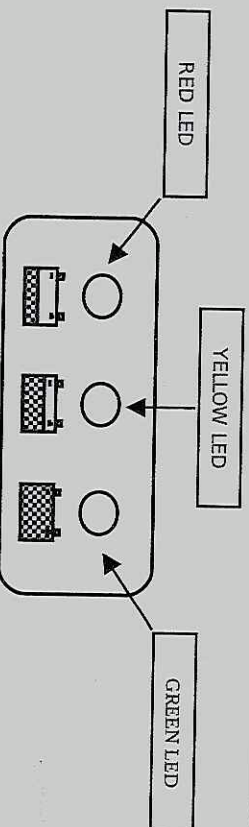
OPERATING PRINCIPLE OF THE CBHD1 - CBHD2 - CBHD3 - HF1-IP

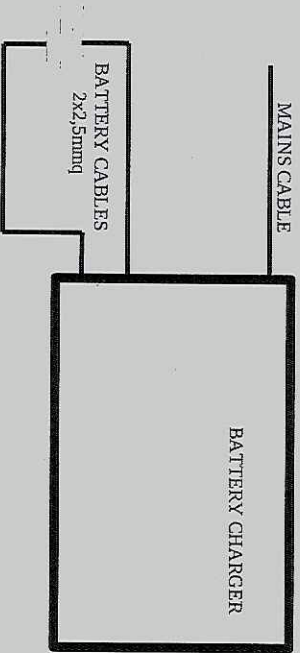
On switching on a new battery charger of the CBHD1 - CBHD2 - CBHD3 - HF1-IP series, the charger will check the battery voltage and decide whether to start the charging process. If the battery is not connected to the battery charger, the yellow LED will flash. If the result of the test is positive after 1 second the charging of the battery can start, with the red LED on. The output relay closes and the current of the first phase rises slowly till the nominal value programmed is reached. If during the battery charge process the user disconnects the actual battery from the battery charger, after a few seconds the battery charger will reset and get ready to start a new charge process (available on request). The progress of the charging process is shown by three LED's: red, yellow and green, as in the whole range of the battery chargers. The green LED shows the end of the charging or the last phase in case of deep charging process: in the former case, the relay is opened to disconnect galvanically the battery from the battery charger.

VISUAL SIGNALS

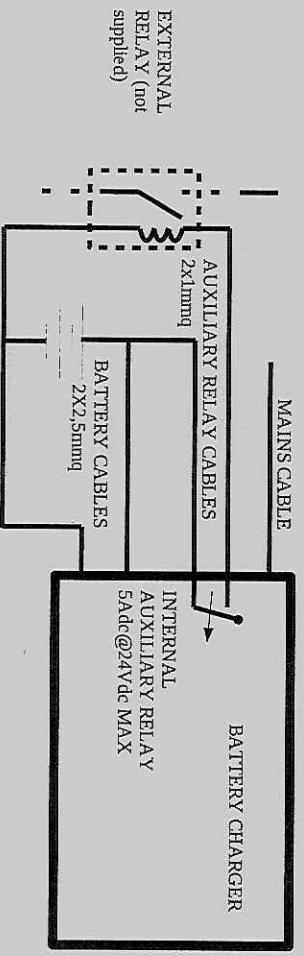
Please find in the following table a list of the visual signals of the CBHD1 - CBHD2 - CBHD3 - HF1-IP.

SIGNAL (LED)	MEANING
Red LED flashing (twice)	Battery charger set to charge Lead-Acid batteries
Green LED flashing (twice)	Battery charger set to charge GEL and/or AGM batteries
Red LED on	First phase of charge in progress
Yellow LED on	Second phase of charge in progress
Green LED on	End of charge or maintenance phase
ANOMALIES	
Yellow LED flashing	UNSUITABLE BATTERY OR BATTERY NOT CONNECTED OR OUTPUT SHORT CIRCUIT
Red LED flashing	SAFETY TIMER EXCEEDED INTERNAL SHORT CIRCUIT





Example diagram of connection between battery charger and battery.



Example diagram of connection with use of battery charger internal auxiliary relay. The auxiliary relay is Normally Off and switches on when the battery charger is turned on. The internal auxiliary relay can be used with maximum voltages of 5Adc to 24Vdc.



CE DECLARATION OF CONFORMITY

According to: EN ISO/IEC 17050-1:2005

We

S.P.E. ELETTRONICA INDUSTRIALE di Poletti Sergio
Via di Mezzo Ponente, 383 - 40014 Crevalcore (Bologna) ITALY

Declare under our sole responsibility that the product:

ELECTRONIC AUTOMATIC BATTERY CHARGER MODEL:

CBHD1 - CBHD2 - CBHD3 - HF1-IP

to which this declaration applies, complies with the provisions of the Directives of the Council of the European Union on the approximation of the laws of the members states:

Relating to Electromagnetic Compatibility (EMC) Directive 2004/108/EC of the European Parliament and of the council of 15 December 2004 on the approximation of the laws of the member states relating to electromagnetic compatibility and repealing directive 89/336/EEC, conformity is proven by compliance with the following standard:

- ✓ EN 55014-1 (Emission)
- ✓ EN 55014-2+A1+A2 (Immunity - Category II)

Relating to Extra Low Voltage (LVD) Directive 2006/95/EC of the European parliament and of the council of 12 December 2006 on the harmonisation of the laws of member states relating to electrical equipment designed for use within certain voltage limits, conformity is proven by compliance with the following standard:

- ✓ EN 60335-2-29:

"Safety of household and similar electrical appliance - Part 2: Particular requirements for battery chargers".

- ✓ EN 62233:

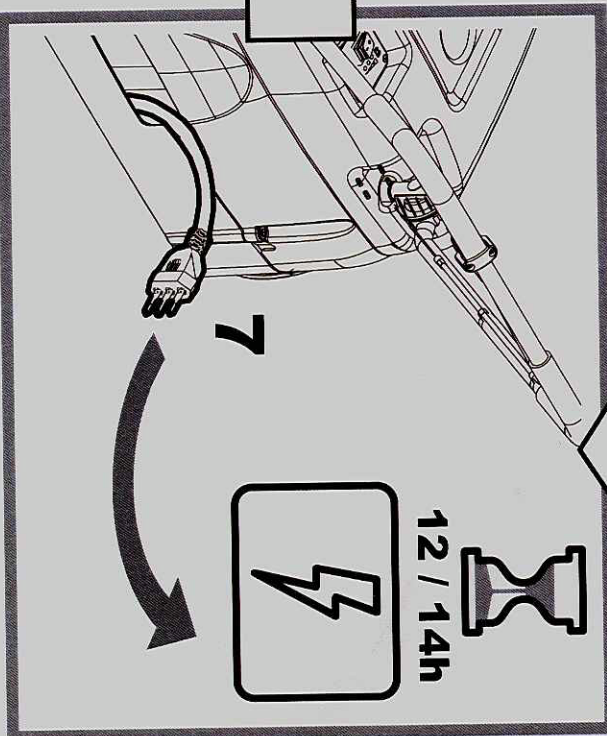
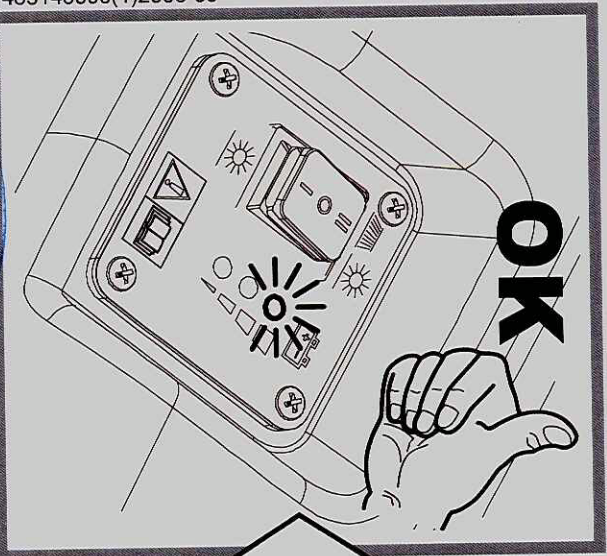
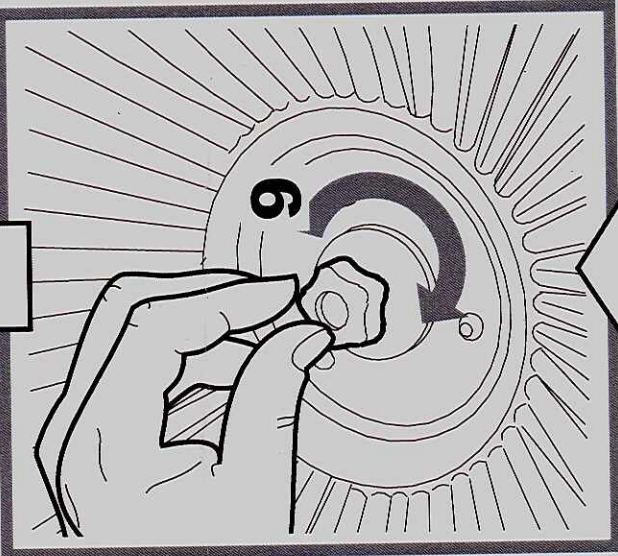
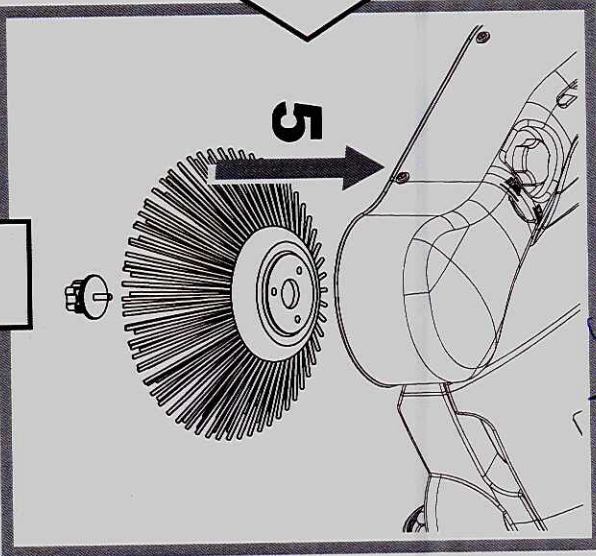
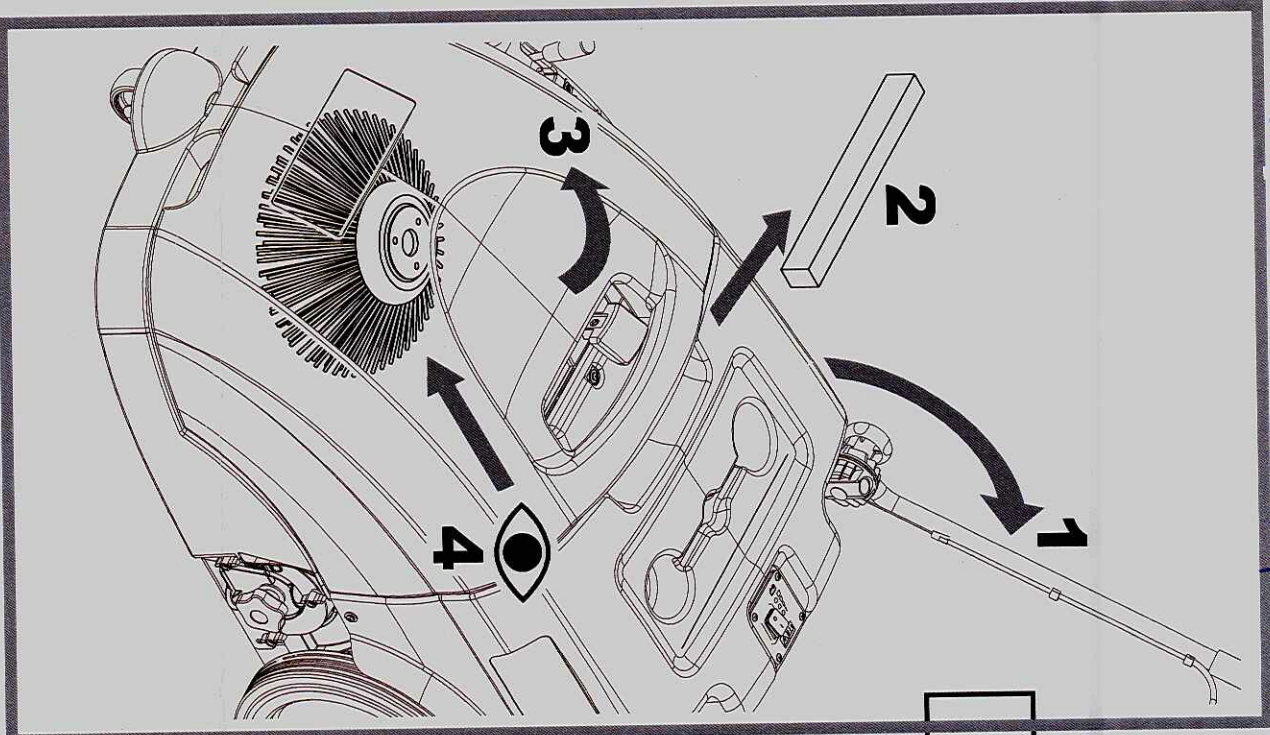
"Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure"

Crevalcore 15-01-2011

Signature

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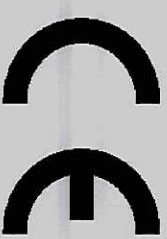
Sweeper with Behind Dash operator



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19 SIRIUS ROAD,
LANE COVE, N.S.W. 2066



Сертификат за съответствие
Osvědčení o shodě
Konformitátsvůjhlášení
Overensstem melsecertifikat
Declaración de conformidad
Vastavussertifikaat
Déclaration de conformité
Yndemrúksávisvottodistús

Conformity certificate
Πιστοποίηση συμμόρφωσης
Megfelelősségi nyilatkozás
Dichiarazione di conformità
Atiškies deklaracija
Atbilstības deklarācija
Konformitetsserifisering
Conformiteitsverklaring

Declaração de conformidade
Declaración zgodności
Certificat de conformitate
Заявление о соответствии
Överensstämmelsecertifikat
Certifikát shladení
Certifikát o ustreznosti
Uymruluk sertifikasi

SW750

Model / Model / Modell / Modelo / Model / Modél / Malle /
Model / Модел / Model / Modello / Models / Modells / Model / Model /
Modelo / Model / Model / Модель / Model / Model / Model / Model /

Тип / Тип / Type / Tipo / Típus / Type / Type / Type / Type / Type /
Tipus / Tipo / Tipus / Típus / Type / Tipo / Type / Tipo / Type /
Typ / Tip / Tip :

Sweeper

BG Доруподписаният потвърждава, че горепосроменаният модел е произведен в съответствие със следните директиви и стандарти. Техническият файл е съхранен от производителя.

GB The undersigned certify that the above mentioned model is produced in accordance with the following directives and standards. The technical file is compiled by the manufacturer.

P A presente assinatura serve para declarar que os modelos supramencionados são produzidos em conformidade com as seguintes directivas e normas. A ficha técnica é redigida pelo fabricante.

CZ Níže podepsaný stvrdzuje, že výše uvedený model byl vyroben v souladu s následujícími směrniciemi a normami. Další technické číslo listu je u výrobce. Autorem technického listu je výrobce.

GR Ο κτιρωθι υποσηφισμενος προτομοι οτι η παραγωγη του προσηφισμενου μονηρακου υφεται συμφωνα με ης ακολυθες οβηγες και προηυτα. Το τεχνικό αρχείο συνηλοσεται απο τον κατασκευαστη.

PL Nízej podpisany zaświadczca, że wymieniony powyżej model produkowany jest zgodnie z następującymi dyrektywami i normami. Dokumenty techniczne zostały przygotowane przez producenta.

D Der Unterzeichner bestätigt hiermit dass die oben erwähnten Modelle gemäß den folgenden Richtlinien und Normen hergestellt wurden. Die technische Dokumentation wird vom Hersteller erstellt.

H Alulírtak ígazoljuk, hogy a fent említett modell a követező irányelvek és szabványok alapján hoztuk létre. A műszaki fájlt a gyártó készítette.

RO Subsemnatul atest că modelul sus-menționat este produs în conformitate cu următoarele directive și standarde. Fișierul tehnic este redactat de către producător.

DK Undertegneede attesterer herved, at ovenævnte model er produceret i overensstemmelse med følgende direktiver og standarder. Den tekniske fil er udarbejdet af fabrikanten.

I Il sottoscritto dichiara che il modello sopra menzionato sono prodotti in accordo con le seguenti direttive e standard. Il fascicolo tecnico è redatto dal costruttore.

RUS Настоящим удостоверяется, что машина вышеуказанной модели изготовлена в соответствии со следующими директивами и стандартами. Техническая документация составлена производителем.

E El abajo firmante certifica que los modelos arriba mencionados han sido producidos de acuerdo con las siguientes directivas y estándares. El fascículo técnico está redactado por el fabricante

LT Toliau pateiktu dokumentu patvirtinama, kad minėtas modelis yra pagamintas laikantis nurodytu direktyvų bei standartų. Techninė byla sudarė gamintojas.

S Undertecknad inlydgar att ovanämnda modell är producerad i överensstämmelse med följande direktiv och standarder. Den tekniska filen är sammanställd av tillverkaren.

EST Allakirjutanu kinnitab, et ülalnimetatud mudel on valmistatud kooskõlas järgmistele direktiivide ja normidega. Tehnilise dokumentatsiooni koostab tootja.

LV Ar šo tiek apliecināts, ka augstākminētais modelis ir izgatavots atbilstoši šādām direktīvām un standartiem. Tehnisko aprakstu ir sastādījis ražotājs.

SK Dolu podpisany osvedčuje, že hore uvedený model sa vyrába v súlade s nasledujúcimi smernicami a normami. Technický súbor vyvoril výrobca.

F Je soussigné certifie que les modèles ci-dessus sont fabriqués conformément aux directives et normes suivantes. Le dossier technique est rédigé par le fabricant.

N Undertegnede attesterer att ovennevnte modell är producerat i överensstemmelse med följande direktiv og standarder. Den tekniske filen er oprettet av produsenten.

SLO Spodaj podpisani potrjujem, da je zgoraj omenjeni model izdelan v skladu z naslednjimi smernicami in standardi. Spis s tehnično dokumentacijo pripravil izdelovalec.


FIN Allekirjoittaina vakuuttaa etkä yllämainittu malli on tuotettu seuraavien direktiivien ja standardien mukaan. Valmistaja kaantaa teknisen tiedoston.

NL Ondergetekende verzekert dat de bovengenoemde modellen geproduceerd zijn in overeenstemming met de volgende richtlijnen en standaards. Het technische bestand is door de fabrikant samengesteld.

TR Aşağıda imzası olan kişi, yukarıda bahsedilen model için aşağıda verilen direktiflere ve standartlara uyumlulukla imal edildiğini onaylar. Teknik dosya üretici tarafından derlenmiştir.

EC Machinery Directive 2006/42/EC	EN ISO 12100, EN ISO 13857, EN 349, EN 982
EC Low Voltage Directive 2006/95/EC	EN 60335-1, EN 60335-2-72, EN 50366
EC EMC Directive 2004/108/EC	EN 55022, EN 55014-2, EN 61000-6-2

Prodávateľ / Vyrobce / Hersteller / Fabrikanten /
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