

SC450

Instructions for use

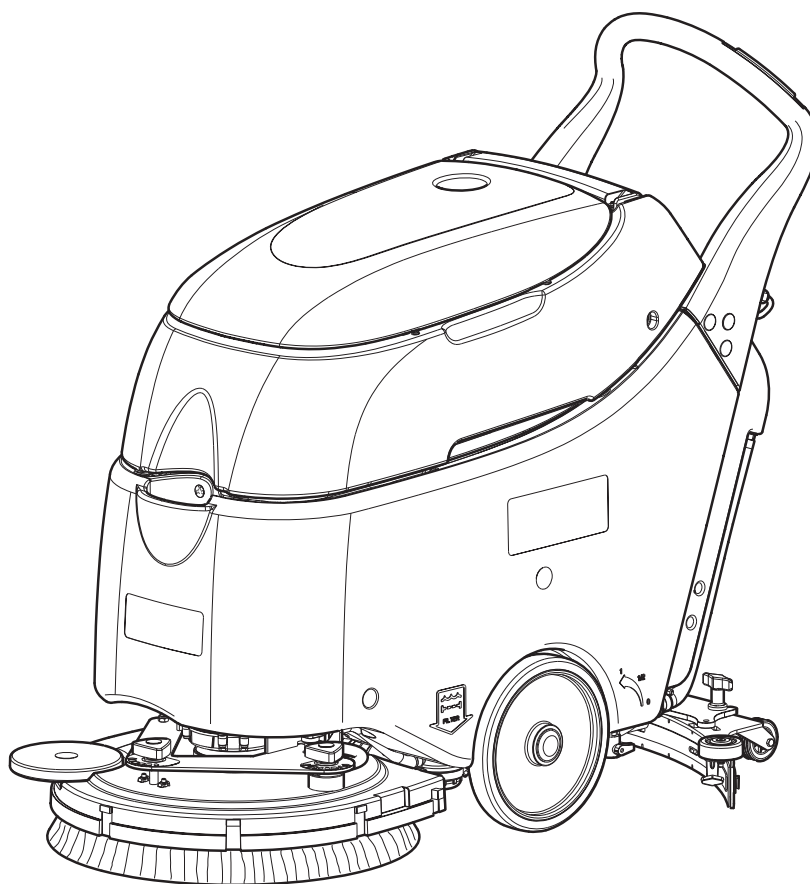
Bedienungshandbuch
Instructions d'utilisation
Instructions for use
Gebruiksaanwijzing



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Deutsch
Français
English
Nederlands



Model:
9087330020 - 9087370020

Сертификат за съответствие
Osvědčení o shodě
Konformitätserklärung
Overensstemmelsecertifikat
Declaración de conformidad
Vastavussertifikaat
Déclaration de conformité
Yhdenmukaisuustodistus
Conformity certificate

Πιστοποιητικό συμμόρφωσης
Megfelelősségi nyilatkozat
Potvrda sukladnosti
Dichiarazione di conformità
Atitikties deklaracija
Atbilstības deklarācija
Konformitetssertifisering
Conformiteitsverklaring
Declaração de conformidade

Deklaracja zgodności
Certificat de conformitate
Заявление о соответствии
Överensstämmelsecertifikat
Certifikát súladu
Certifikat o ustreznosti
Uyumluluk sertifikası



Модел / Model / Modell / Model / Modelo / Mudel / Modèle / Malli / Model
/ Μοντέλο / Modell / Model / Modello / Modelis / Modelis / Modell / Model
/ Modelo / Model / Model / Модель / Modell / Model / Model / Model :

SC450

Тип / Typ / Typ / Type / Tipo / Tüüp / Type / Tuurpi / Type / Τύπος /
Típus / Vrsta / Tipo / Tipas / Tips / Type / Type / Tipo / Typ / Tip / Тип /
Typ / Typ / Tip / Tip :

SCRUBBER-DRYER

Сериен номер / Výrobní číslo / Seriennummer / Seriennummer / Número de serie / Seerianumber / Numéro de série / Sarjanumero / Serial number /
Σειριακός αριθμός / Sorozatszám / Serijski broj / Numero di serie / Serijos numeris / Sērijas numurs / Seriennummer / Seriennummer / Número de série /
Numer seryjny / Număr de serie / Серийный номер / Seriennummer / Výrobné číslo / Serijska številka / Seri Numarası :

Година на производство / Rok výroby / Baujahr / Fabrikationsår / Año de fabricación / Väljallaskeasta / Année de fabrication / Valmistusvuosi / Year of
construction / Έτος κατασκευής / Gyártási év / Godina izgradnje / Anno di costruzione / Pagaminimo metai / Izgatavošanas gads / Byggeår / Bauwjaar /
Ano de fabrico / Rok produkcji / Anul fabricației / Год выпуска / Tillverkningsår / Rok výroby / Leto izdelave / Leto izdelave / İmal yılı :

BG Долуподписаният потвърждава, че гореспоменатият модел е произведен в съответствие със следните директиви и стандарти. Техническият файл е съставен 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 produtos em conformidade com as seguintes directivas e normas. A ficha técnica é redigida pelo fabricante.

CZ Niže podepsaný stvrzuje, že výše uvedený model byl vyroben v souladu s následujícími směrnici a normami. Autorem technického listu je výrobce.

GR Ο κάτωθι υπογεγραμμένος πιστοποιεί ότι η παραγωγή του προαναφερθέντος μοντέλου γίνεται σύμφωνα με τις ακόλουθες οδηγίες και πρότυπα. Το τεχνικό αρχείο συντάσσεται από τον κατασκευαστή.

PL Niżej podpisany zaświadcza, 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 Alulírottak igazoljuk, hogy a fent említett modellt a következő 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 Undertegnede attesterer herved, at ovennævnte model er produceret i overensstemmelse med følgende direktiver og standarder. Den tekniske fil er udarbejdet af fabrikanten.

HR Potpisani potvrđujem da gore spomenuti model proizveden u skladu sa sljedećim direktivama i standardima. Tehničku dokumentaciju sastavlja proizvođač.

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

I Il sottoscritto dichiara che i modelli sopra menzionati sono prodotti in accordo con le seguenti direttive e standard. Il fascicolo tecnico è redatto dal costruttore.

S Undertecknad intygar att ovannämnda 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.

LT Toliau pateiktu dokumentu patvirtinama, kad minėtas modelis yra pagamintas laikantis nurodytų direktyvų bei standartų. Techninę bylą sudarė gamintojas.

SK Dolu podpísaný osvedčuje, že hore uvedený model sa vyrába v súlade s nasledujúcimi smernicami a normami. Technický súbor vytvoril 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 ovennævnte modell är produceret i överensstemmelse med följande direktiv och 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 pripravi izdelovalec.

FIN Allekirjoittaja vakuuttaa että yllämainittu malli on tuotettu seuraavien direktiivien ja standardien mukaan. Valmistaja kääntää 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 İmzası olan kişi, yukarıda bahsedilen model cihazın aşağıda verilen direktiflere ve standartlara uygunlukta imal edildiğini onaylar. Teknik dosya üretici tarafından derlenmiştir.

EC Machinery Directive 2006/42/EC

EN ISO 12100, EN ISO 13857, EN 349, EN 982

EN 60335-1, EN 60335-2-72, EN 50366

EC EMC Directive 2004/108/EC

EN 55022, EN 55014-2, EN 61000-6-2

Производителя / Výrobce / Hersteller / Fabrikanten /
Fabricante / Tootja / Fabricant / Valmistaja / Manufacturer
/ Κατασκευαστή / Gyártó / Proizvođač / Costruttore
/ Gamintojas / Ražotājs / Produzenten / Fabrikant /
Fabricante / Producenta / Producător / Производителем /
Tillverkaren / Výrobca / Izdelovalec / Üretici :

Nilfisk S.p.A.

Strada Comunale della Braglia, 18 - 26862 - GUARDAMIGLIO (LO) - ITALY

Tel: +39 (0)377 451124, Fax: +39 (0)377 51443

Authorized signatory: Sergio Coccapani, R&D Director

Date:

Signature:

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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 concerning 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 Instruction for use 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 serial number and model name are marked on the plate (29).

Product number and year of production are marked on the same plate.

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

MACHINE model
PRODUCT code
MACHINE serial number

OTHER REFERENCE MANUALS

Electronic Battery Charger Manual (if equipped), to be considered as integral part of this Manual.

Moreover, the following Manuals are available:

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

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, product code 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 accessory must be approved and performed by Nilfisk.

OPERATION CAPABILITIES

This scrubber-dryer is used to clean (scrubbing and drying) smooth and solid floors, in civil or industrial environment, under safe operation conditions by a qualified operator.

The scrubber-dryer cannot be used for fitted carpet and carpet cleaning.

CONVENTIONS

Forward, backward, front, rear, left or right are intended with reference to the operator's position, that is to say in driving position with the hands on the handlebar (2).

UNPACKING/DELIVERY

To unpack the machine, carefully follow the instructions on the packing.

When the machine is delivered, 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.

Please check that the following items have been supplied with the machine:

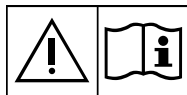
- Technical documents:
 - Scrubber-dryer Instruction for use Manual
 - Electronic Battery Charger Manual (if equipped)
 - Scrubber-dryer Spare Parts List
- No. 1 connector for battery charger (for machines without on board battery charger)
- No. 2 lamellar fuses

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.

VISIBLE SYMBOLS ON THE MACHINE



WARNING!

Carefully read all the instructions before performing any operation on the machine.



WARNING!

Do not wash the machine with direct or pressurized water jets.



WARNING!

Do not use the machine on slopes with a gradient exceeding the specifications.

SYMBOLS THAT APPEAR ON THIS MANUAL



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 Instruction for use 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 cleaning, maintenance, repair or replacement procedure, turn the machine main switches to “0” and disconnect the battery connector.
- This machine must be used by properly trained operators only.
- 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.
- When using lead (WET) batteries, keep sparks, flames and smoking materials away from the batteries. During the normal operation explosive gases are released.
- When using lead (WET) batteries, battery charging produces highly explosive hydrogen gas. During battery charging, remove the recovery tank and perform this procedure in well-ventilated areas and away from naked flames.



WARNING!

- Carefully read all the instructions before performing any maintenance/repair procedure.
- Before using the battery charger, ensure that frequency and voltage values, indicated 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 machine is not working as it should, has been damaged, left outdoors or dropped into water, return it to the 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.
- Do not smoke while charging the batteries.

**WARNING!**

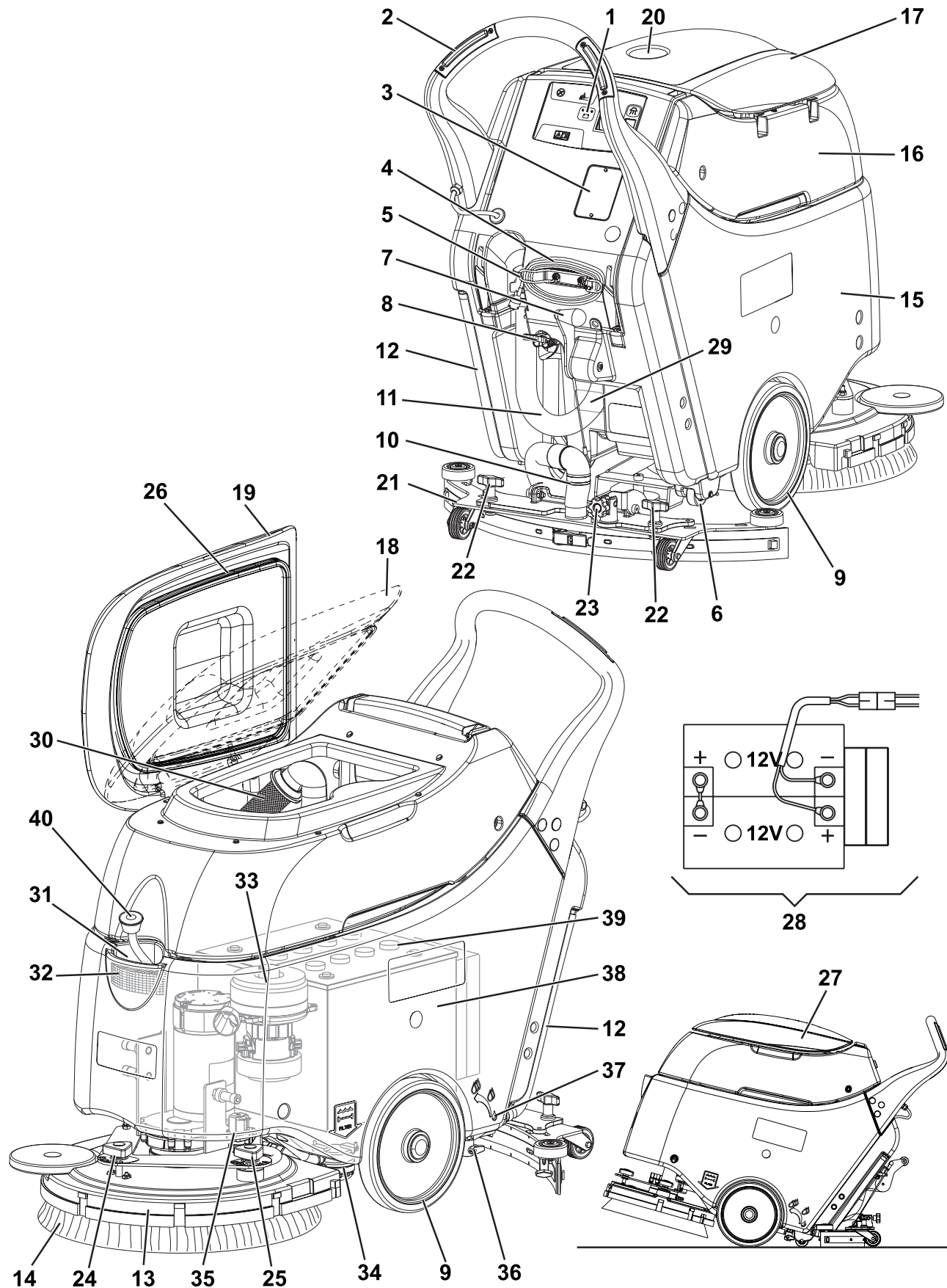
- Always protect the machine against the sun, rain and bad weather, both under operation and inactivity condition. Store the machine indoors, in a dry place: This machine must be used in dry conditions, it must not be used or kept outdoors in wet conditions.
- Before using the machine, close all doors and/or covers as shown in the Instruction for use Manual.
- This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the machine by a person responsible for their safety. Children should be supervised to ensure that they do not play with the machine.
- Close attention is necessary when used near children.
- Use only as shown in this Manual. Use only Nilfisk's recommended accessories.
- Check the machine carefully before each use, always check that all the components have been assembled before use. If the machine is not perfectly assembled it can cause damages to people and properties.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.
- Do not use the machine on slopes with a gradient exceeding the specifications.
- Do not use the machine on incline.
- Do not use the machine on slopes with a gradient exceeding the specifications.
- Do not use the machine in particularly dusty areas.
- Use the machine only where a proper lighting is provided.
- While using this machine, take care not to cause damage to people or objects.
- Do not bump into shelves or scaffoldings, especially where there is a risk of falling objects.
- Do not lean liquid containers on the machine, use the relevant can holder.
- The machine working temperature must be between 0 °C and +40 °C.
- The machine storage temperature must be between 0 °C and +40 °C.
- The humidity must be between 30% and 95%.
- When using floor cleaning detergents, follow the instructions on the labels of the detergent bottles.
- To handle floor cleaning detergents, wear suitable gloves and protections.
- Do not use the machine as a means of transport.
- Do not allow the brush/pad to operate while the machine is stationary to avoid damaging the floor.
- In case of fire, use a powder fire extinguisher, not a water one.
- Do not tamper with the machine safety guards and follow the ordinary maintenance instructions scrupulously.
- Do not allow any object to enter into the openings. Do not use the machine if the openings are clogged. Always keep the openings free from dust, hairs and any other foreign material which could reduce the air flow.
- Do not remove or modify the plates affixed to the machine.
- This machine cannot be used on roads or public streets.
- Pay attention during machine transportation when temperature is below freezing point. The water in the recovery tank or in the hoses could freeze and seriously damage the machine.
- Use brushes and pads supplied with the machine or those specified in the Instruction for use Manual. Using other brushes or pads could reduce safety.
- In case of machine malfunctions, ensure that these are not due to lack of maintenance. If necessary, request assistance from the authorised personnel or from an authorised Service Center.
- If parts must be replaced, require ORIGINAL spare parts from an Authorised Dealer or Retailer.
- 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.
- Do not wash the machine with direct or pressurised water jets, or with corrosive substances.
- The machine must be disposed of properly, because of the presence of toxic-harmful materials (batteries, etc.), which are subject to standards that require disposal in special centres (see Scrapping chapter).

MACHINE DESCRIPTION

MACHINE STRUCTURE

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Control panel 2. Handlebar 3. Battery charger data inspection window (*) 4. Battery charger cable (*) 5. Battery charger cable holder (*) 6. Rear parking wheel 7. Squeegee lifting/lowering lever 8. Battery connector (red).
This connector also works as EMERGENCY push-button, to stop immediately all functions. 9. Front wheels on fixed axle 10. Squeegee vacuum hose 11. Recovery water drain hose 12. Solution drain and level check hose 13. Brush deck 14. Brush/pad-holder 15. Solution tank 16. Recovery tank 17. Recovery tank cover 18. Recovery tank cover (half-open) 19. Recovery tank cover (completely opened) 20. Can holder | <ol style="list-style-type: none"> 21. Squeegee 22. Squeegee mounting handwheels 23. Squeegee balance adjusting handwheel 24. Machine straight forward movement adjusting handwheel 25. Machine forward speed adjusting handwheel 26. Tank cover gasket 27. Machine in parking position 28. Battery connection diagram 29. Serial number plate/technical data/conformity certification 30. Vacuum grid with automatic shut-off float 31. Solution filler neck 32. Foam filter 33. Vacuum system motor 34. Solution filter 35. Solenoid valve 36. Solution flow control lever 37. Solution flow control lever ECO position (water "economy" usage, for a washing autonomy set for ~ 90 minutes) 38. Batteries 39. Battery caps 40. Water removable filler hose (optional) <p>(*) Only with battery charger (optional) installed</p> |
|---|--|

MACHINE STRUCTURE (Continues)

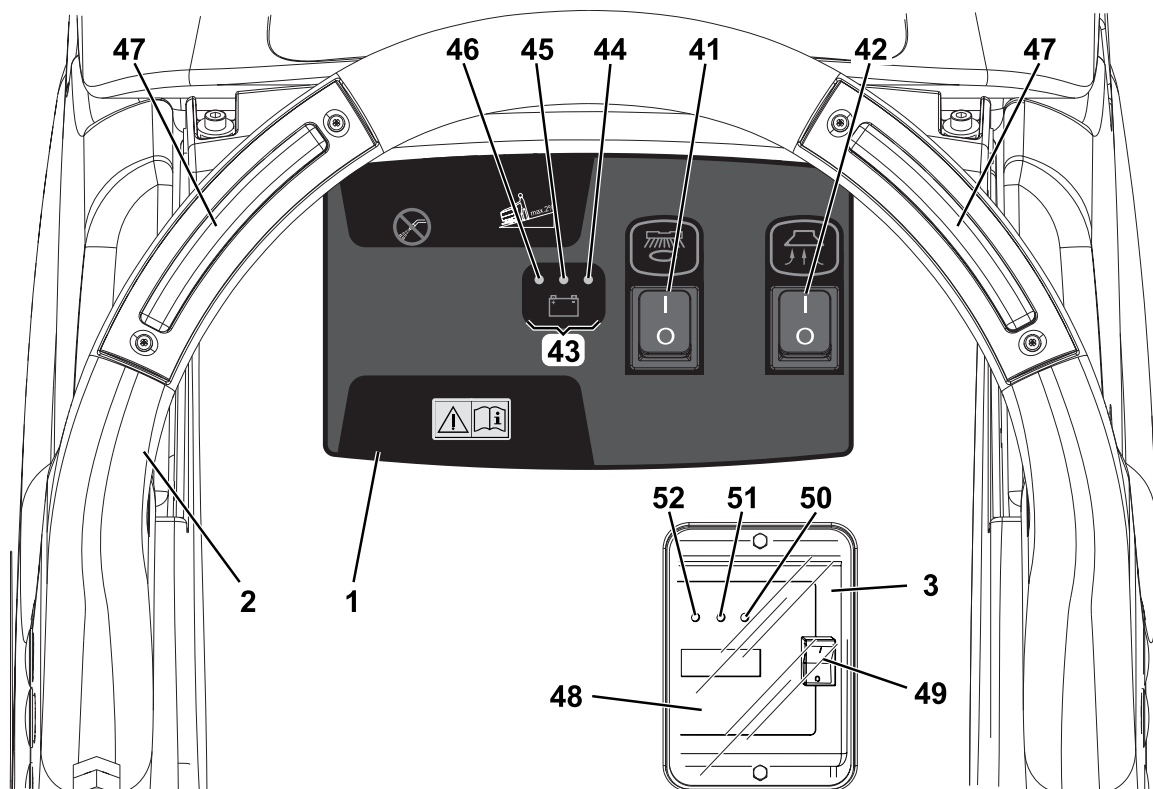


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CONTROL PANEL

- | | |
|--|--|
| 41. Brush/pad-holder switch | 49. Lead (WET) or gel (GEL) battery selector (*) |
| 42. Vacuum system switch | 50. Green warning light (the battery charger is on and batteries are charged) (*) |
| 43. Battery charge indicator | 51. Yellow warning light (the battery charger is on and batteries are semi-discharged) (*) |
| 44. Green LED - charged battery | 52. Red warning light (the battery charger is on and it is charging the batteries) (*) |
| 45. Yellow LED - semi-discharged batteries | |
| 46. Red LED - discharged batteries | |
| 47. Brush switches | |
| 48. Electronic battery charger (*) | |

(*) Only with battery charger (optional) installed



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ACCESSORIES/OPTIONS

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

- GEL batteries
- Electronic battery charger
- Brushes of different materials
- Pads of different materials
- Polyurethane squeegee blades
- Removable solution feed hose

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

TECHNICAL DATA

Model	SC450
Solution tank capacity	40 litres
Recovery tank capacity	45 litres
Machine length	1,180 mm
Machine width without squeegee	559 mm
Machine height	1,060 mm
Cleaning width	530 mm
Squeegee width	760 mm
Brush diameter	530 mm
Front wheel diameter	254 mm
Wheel specific pressure on the floor	4.9 N/mm ²
Brush/pad pressure (with full tank and lowered squeegee)	34 kg
Min/max solution flow	0.4 + 1.6 L/min
ECO solution flow	0.4 L/min
Sound pressure level at workstation (ISO 11201, ISO 4871, EN 60335-2-72) (LpA)	68 dB(A) ± 3 dB(A)
Machine sound power level (ISO 3744, ISO 4871, EN 60335-2-72) (LwA)	85 dB(A)
Vibration level at the operator's arms (ISO 5349-1, EN 60335-2-72)	< 2.5 m/s ²
Maximum gradient when working	2 %
Protection class (IP)	X4
Protection class (electric)	III
Vacuum system motor power	330 W
Vacuum system circuit capacity	1,100 mm H ₂ O
Brush motor power	480 W
Brush speed	154 rpm
Total absorbed power	0.8 kW
Battery compartment size (width x length x height)	350 x 350 x 300 mm
Battery voltage	24 V
Standard batteries (2)	Dry: 12 V 70 Ah C5
Battery charger (optional)	100-240 VAC
Standard battery autonomy	2 hour
Weight without batteries and with empty tanks	70 kg
Gross vehicle weight (GVW)	190 kg
Shipping weight	97 kg

Machine material composition and recyclability

Type	Recyclable percentage	SC450
Aluminium	100 %	8 %
Electric motors - various	29 %	18 %
Ferrous materials	100 %	19 %
Wiring harness	80 %	1 %
Liquids	100 %	0 %
Plastic - non-recyclable material	0 %	1 %
Plastic - recyclable material	100 %	9 %
Polyethylene	92 %	42 %
Rubber	20 %	2 %

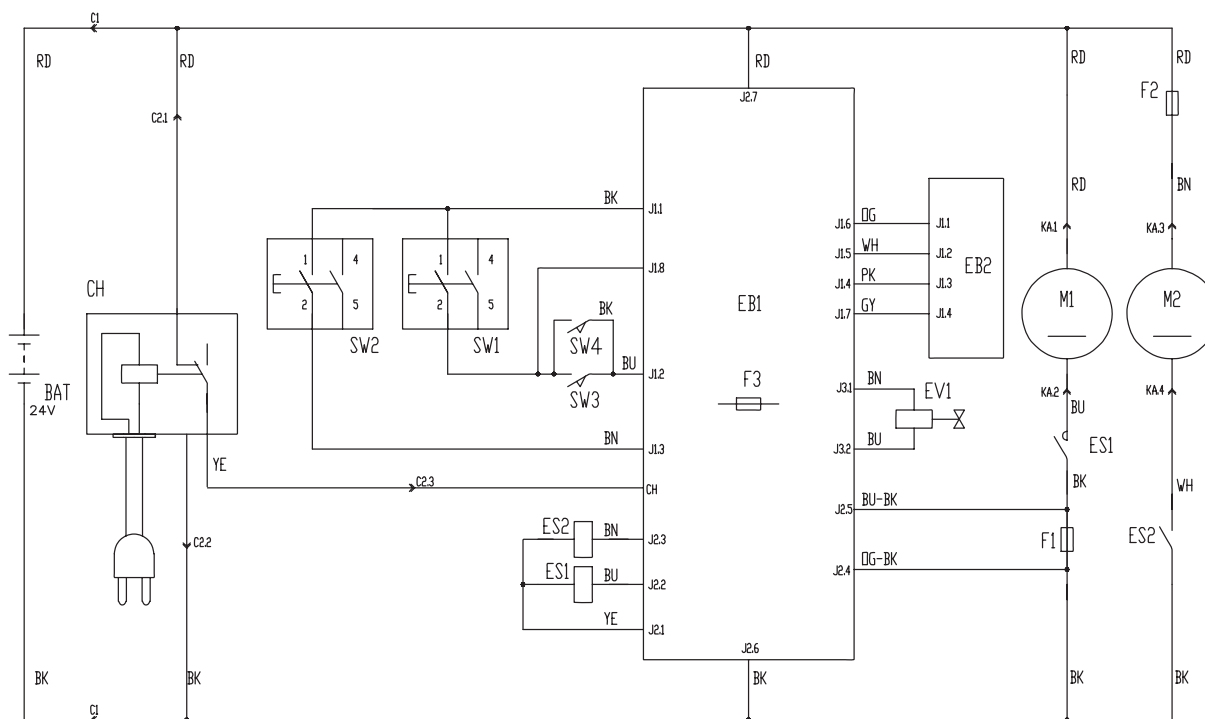
WIRING DIAGRAM

Key

BAT	24 V batteries
C1	Battery connector
C2	Battery charger connector (optional)
CH	Battery charger (optional)
EB1	Function electronic board
EB2	Electronic board LEDs
ES1	Brush/pad motor electromagnetic switch
ES2	Vacuum system motor relay
EV1	Solution solenoid valve
F1	Brush motor fuse (40 A)
F2	Vacuum system motor fuse (30 A)
F3	Solenoid valve and electronic board fuse (5 A)
M1	Brush/pad-holder motor
M2	Vacuum system motor
SW1	Brush/pad-holder switch
SW2	Vacuum system switch
SW3	Brush switch
SW4	Brush switch

Colour codes

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



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USE



WARNING!

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

- **DANGER**
- **WARNING**
- **CAUTION**
- **CONSULTATION**

While reading this Manual, the operator must pay particular attention to the symbols shown on the plates (see Visible Symbols On The Machine paragraph).

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

BATTERY CHECK/SETTING ON A NEW MACHINE



WARNING!

The electric components of the machine can be seriously damaged if the batteries are either improperly installed or connected.

The batteries must be installed by qualified personnel only. Set the battery charger (optional) according to the battery type (WET or GEL/AGM).

Check the batteries for damage before installation.

Disconnect the battery connector and the battery charger plug.

Handle the batteries with great care.

Install the battery terminal protection caps supplied with the machine.

The machine requires two 12 V batteries, connected according to the diagram (28).

The machine can be supplied in one of the following modes:

WET or GEL/AGM batteries already installed and ready to be used

1. Turn on the machine by pressing the brush/pad-holder and vacuum system switches (41 and 42). If the green LED (44) turns on, the batteries are ready to be used.
2. If the yellow or red LED (45 or 46) turns on, the batteries must be charged (see the procedure in Maintenance chapter).

Without batteries

1. Buy appropriate batteries [See the Technical Data paragraph and the diagram (28)]. For battery choice and installation, apply to qualified battery Retailers.
2. Set the machine and the battery charger (if equipped) according to the type of batteries installed, according to the procedure shown in the following paragraph.

BATTERY INSTALLATION AND BATTERY TYPE SETTING (WET OR GEL/AGM)

Set the electronic board of the machine and of the battery charger (if equipped) according to the type of batteries installed (WET or GEL/AGM) as shown below:

Machine Setting

1. Check that the battery connector (8) is disconnected. The machine factory setting is for GEL batteries. If this setting corresponds to the type of batteries installed, go to step 7. Otherwise, perform steps 2, 3 and 4 too.
2. Move aside the recovery water drain hose (11).
3. Remove the battery charger cable, if equipped, from the cable holder (5).
4. Remove the screws (A, Fig. 1) and carefully move aside the panel (B) by disengaging the grommet (C) from its housing on the panel (B).
5. Turn the microswitch (D) to WET position.



WARNING!

Do not move/set the adjacent switch (E).

6. Perform steps 3, 4 and 5 in the reverse order.

Battery Charger Setting (for machines with on-board battery charger)

7. Remove the battery charger data inspection window screws (A, Fig. 2).
8. Remove the window (B).
9. Turn the battery charger selector (C) to WET for lead batteries, or to GEL for gel/agm batteries.
10. Install the window (B) and tighten the screws (A).

Battery Installation

11. Remove the recovery tank (16) as shown in the relevant paragraph.
12. Install the batteries on the machine according to the diagram (28).



CAUTION!

For a proper machine balance, install the batteries in the compartment, with the shims placed on the rear wall.

13. Install the recovery tank (16).

Battery Charging

14. Charge the batteries (see the procedure in Maintenance chapter).

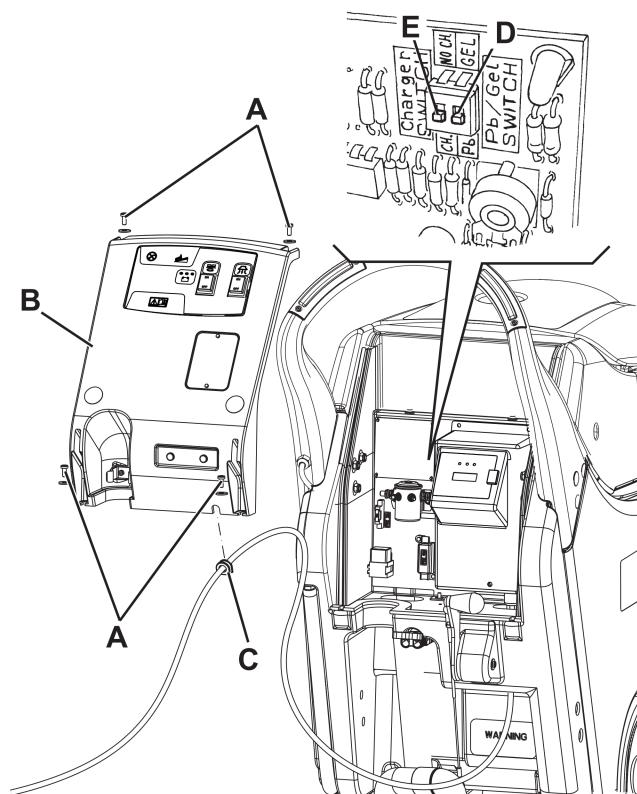


Figure 1

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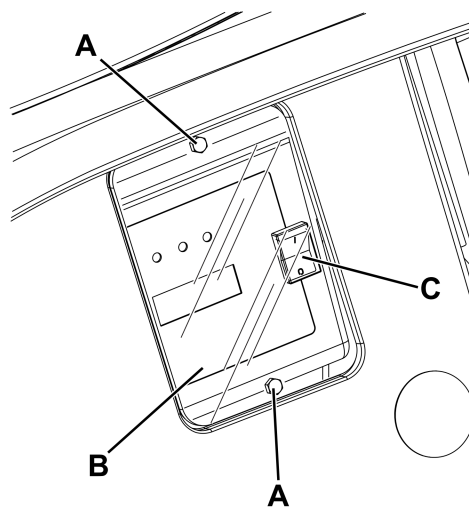


Figure 2

P100662

BEFORE MACHINE START-UP

Brush or pad-holder installation


NOTE

Install either the brush (A, Fig. 3) or the pad-holder (B and C) according to the type of floor to be cleaned.

1. Make sure that the switches (41 and 42) are turned to "0".
2. Lift the brush/pad-holder deck (13) by prying the handlebar (2).
3. Place the brush (A, Fig. 3) or the pad-holder (B - C) under the deck.
4. Lower the deck (13) by using the handlebar (2).
5. Turn on the machine by pressing the switch (41).
6. Press the push-buttons (47) for a few seconds, to engage the brush/pad-holder to the deck hub (13). If necessary, repeat the procedure until the brush/pad-holder is engaged.

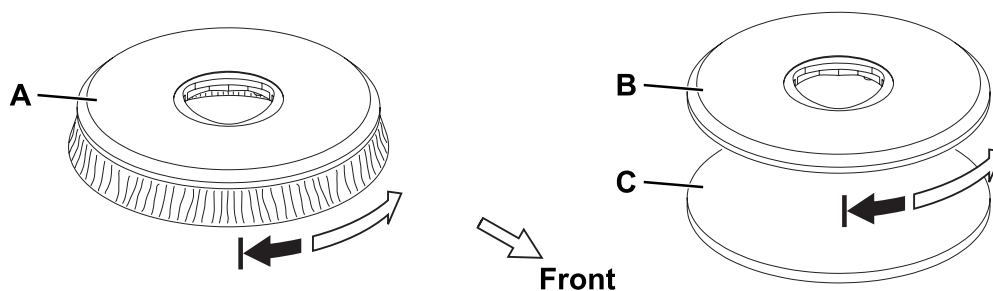


Figure 3

P100663

Available brushes and their relevant application guides (suggestions only)

Models	MIDLITE GRIT 180	MIDGRIT 240	PROLENE	PROLITE	UNION MIX
General cleaning:					
Concrete					
Terrazzo floor					
Ceramic tiles/quarrrystones					
Marble					
Vinyl tiles					
Rubber tiles					
Polishing:					
Rubber tiles					
Marble					
Vinyl tiles					

Squeegee installation

7. Install the squeegee (21) and fasten it with the handwheels (22), then connect the vacuum hose (10) to the squeegee.
8. With the handwheel (23), adjust the squeegee so that the rear blade - in all its length - touches the floor and the front blade is slightly detached from the floor.

Solution tank filling**CAUTION!**

Use only low-foam and non-flammable detergents, intended for automatic scrubber applications.

**WARNING!**

When using floor cleaning detergents, follow the instructions on the labels of the detergent bottles.

To handle floor cleaning detergents, wear suitable gloves and protections.

9. Use the filler neck (31) or the removable filler hose (40, optional) to fill the tank (15) with a solution suitable for the work to be performed. Do not fill the solution tank completely, leave few centimetres from the edge. Always follow the dilution instructions on the label of the chemical product used to prepare the solution. The solution temperature must not exceed 40 °C.

MACHINE START AND STOP**Starting the machine**

1. Prepare the machine as shown in the previous paragraph.
2. Drive the machine to the working place by pushing it with the hands on the handlebar (2).
3. Lower the squeegee (21) with the lever (7).
4. Turn the solution flow control lever (36) to one of the following positions, according to the type of cleaning to be performed:
 - ECO system: when the lever (36) is turned to ECO position (37), the machine works in a special condition of programmed water "economy" usage; as the water flow is set and constant, the machine can work with a washing autonomy of ~ 90 minutes (0.4 litres/min average).
 - Variable system: when the lever is turned to the left (variable flow) the flow rate can increase up to 1.6 litres/min (when the tank is full), with an autonomy of ~ 40 minutes.
5. Press the brush/pad-holder switch (41) and the vacuum system switch (42).
6. Press the push-buttons (47) to enable the brush/pad-holder.
7. Start cleaning, by moving the machine with the handlebar (2).

**NOTE**

If the green LED (44) turns on, the machine is ready to be used. If the yellow or red LED (45 or 46) turns on, the batteries must be charged (see the procedure in Maintenance chapter).

Stopping the machine

8. Stop the machine and the brush/pad-holder by releasing the push-buttons (47).
9. Turn off the brush/pad-holder and the vacuum system by pressing the switches (41) and (42).
10. Lift the squeegee (21) with the lever (7).
11. With the handlebar (2) slightly lower the machine until the rear wheel (6) comes into contact with the floor (parking position (27)).

MACHINE OPERATION (SCRUBBING/DRYING)

1. Start the machine as shown in the previous paragraph.
2. While keeping both hands on the handlebar (2), press the push-buttons (47), then manoeuvre the machine and start scrubbing/drying the floor.
3. If necessary, stop the machine and adjust the squeegee balancing handwheel (23).
4. If necessary, adjust the solution quantity by using the valve (36).



CAUTION!

To avoid any damage to the floor surface, turn off the brush/pad-holder when the machine stops in one place.



CAUTION!

Before lifting the brush/pad, turn it off by releasing the push-buttons (47).



NOTE

For correct scrubbing/drying of floors at the sides of the walls, Nilfisk suggests to go near the walls with the right side of the machine as shown in figure 4.

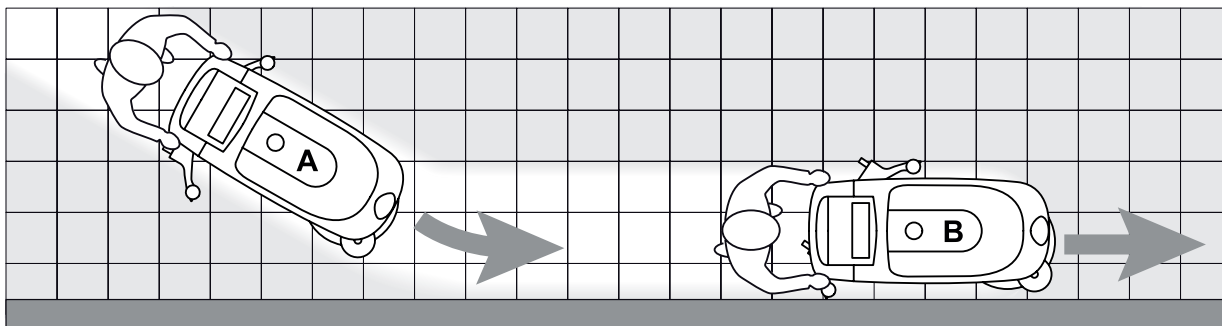


Figure 4

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CAUTION!

In case of brush/pad-holder motor overload, due to foreign bodies which prevent them from turning, or to excessively aggressive floors/brushes, the safety system stops the brush/pad-holder after about one minute of continuous overload.

The overload is shown by the three LEDs (44, 45, 46) flashing simultaneously.

To start scrubbing again after a brush/pad-holder stop due to overload, stop the machine by turning the brush/pad-holder switch and the vacuum system switch (41 and 42) to "0". Turn on the machine by turning the brush/pad-holder switch and the vacuum system switch (41 and 42) to "1".

Battery discharge during operation

5. Until the green LED (44) stays on, the batteries allow the machine to work normally. When the green LED (44) turns off and the yellow and red LED (45) and (46) turn on in sequence, it is necessary to charge the battery as the machine residual autonomy is at the minimum level.



CAUTION!

Do not use the machine with discharged batteries, to avoid damaging the batteries and reducing the battery life.

Machine speed adjustment

6. The machine speed varies according to the type of floor to be cleaned and the choice of using the brush or the pad. If necessary, stop the machine and turn the forward speed adjusting handwheel (25) as shown below:
 - Turn it counter-clockwise to increase the forward speed;
 - Turn it clockwise to decrease the forward speed.

Machine straight-forward drive

7. If it is difficult to keep the machine moving straight-forwardly because it deviates to the left or to the right, adjust the handwheel (24) by turning it clockwise or counter-clockwise.

MACHINE TRANSPORT/PARKING

To transport/park the machine, proceed as follows.

1. Turn the brush/pad-holder switch and the vacuum system switch (41 and 42) to "0".
2. Lift the squeegee with the lever (7).
3. Grab the handlebar (2) and slightly lower it until the brush lifts from the floor. While holding the machine in this position, drive it to the appointed parking area. Then lower the machine until the rear wheel (6) comes into contact with the floor (parking position (27)).
4. When finishing working, remove the brush/pad-holder (see the procedure in Maintenance chapter).

TANK EMPTYING

An automatic float shut-off system (30) turns off the vacuum system when the recovery tank (16) is full.

The vacuum system deactivation is signalled by a sudden increase in the vacuum system motor noise frequency, and the floor is not dried.



CAUTION!

If the vacuum system turns off accidentally (for example, when the float is activated because of a sudden machine movement), to resume the operation: turn off the vacuum system by pressing the switch (42), then open the cover (17) and check that the float inside the grid (30) has gone down to the water level. Then close the cover (17) and turn on the vacuum system by pressing the switch (42).

When the recovery tank (16) is full, empty it according to the following procedure.

Recovery tank emptying

1. Turn the brush/pad-holder switch and the vacuum system switch (41 and 42) to "0".
2. Lift the squeegee with the lever (7).
3. Drive the machine to the appointed disposal area.
4. Grasp the handlebar (2) and slightly lower it until the rear wheel (6) comes into contact with the floor.
5. Empty the recovery tank with the drain hose (11). Then, rinse the tank with clean water.

Solution tank emptying

6. Perform steps 1 to 4.
7. Empty the solution tank with the hose (12). Then, rinse the tank with clean water.

AFTER USING THE MACHINE

After working, before leaving the machine:

1. Turn the brush/pad-holder switch and the vacuum system switch (41 and 42) to "0".
2. Remove the brush/pad-holder as shown in Maintenance chapter.
3. Empty the tanks (15 and 16) as shown in the previous paragraph.
4. Perform the daily maintenance procedures (see the Maintenance chapter).
5. Store the machine in a clean and dry place, with the brush/pad-holder and the squeegee lifted or removed.

RECOVERY TANK REMOVAL

To check or charge the lead (WET) batteries, or to perform other procedures, it may be necessary to remove the recovery tank (16) as shown below.

1. Empty the recovery tank (16) as shown in the relevant paragraph.
2. Drive the machine on a level floor.
3. Make sure that the switches (41 and 42) are turned to "0".
4. Remove the recovery water drain hose (11) from its holder.
5. Grasp the recovery tank (A, Fig. 5) in the area (B) and slightly raise it.
6. Disconnect the vacuum hose (C) from the tank.
7. Disconnect the hose (D) from the tank vacuum grid.
8. Remove the drain hose(E) through the slit, then remove the tank (A).

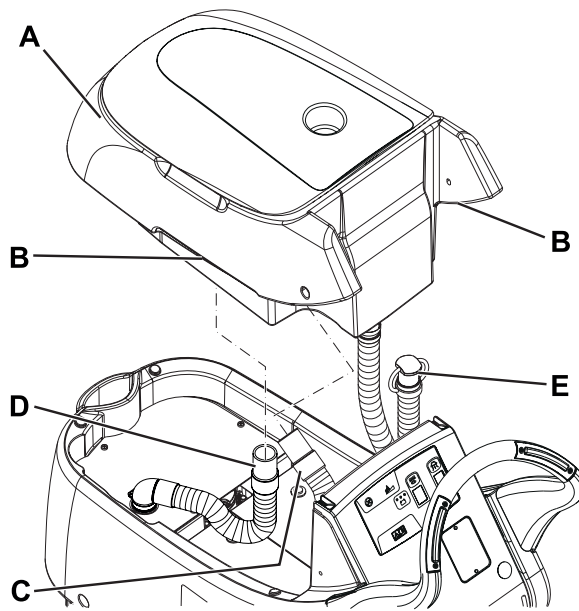


Figure 5

9. Install the tank by performing steps 4 to 8 in the reverse order of removal.

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MACHINE LONG INACTIVITY

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

1. Perform the procedures shown in After Using the Machine paragraph.
2. Disconnect the battery connector (8).

MAINTENANCE

The lifespan of the machine and its maximum operating safety are ensured by correct and regular maintenance. The following chart 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!

Maintenance procedures must be performed with the machine switched off and the batteries/battery charger cable disconnected.

Moreover, carefully read the instructions in the Safety chapter.

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

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

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	Daily, after using the machine	Weekly	Every six months	Yearly
Battery Charging				
Squeegee Cleaning				
Brush/pad cleaning				
Tank and vacuum grid with float cleaning, and cover gasket check				
Squeegee Blade Check and Replacement				
Solution Filter Cleaning				
WET battery fluid level check				
Brush/pad-holder motor carbon brush check or replacement				(1)
Vacuum system motor carbon brush check or replacement				(1)

(1) This maintenance procedure must be performed by an authorised Nilfisk Service Center.

BATTERY CHARGING



NOTE

Charge the batteries when the yellow or red LED (45 or 46) turns on, or at the end of each working cycle.



CAUTION!

Keeping the batteries charged make their life last longer.



CAUTION!

When the batteries are discharged, charge them as soon as possible, as that condition makes their life shorter. Check for battery charge at least once a week.



CAUTION!

If the machine is not equipped with on-board battery charger, choose an external battery charger suitable for the type of batteries installed.



WARNING!

WET battery charging produces highly explosive hydrogen gas. Charge the batteries in well-ventilated areas and away from naked flames. Do not smoke while charging the batteries. Do not reinstall the recovery tank until the battery charging cycle is over.



WARNING!

Pay careful attention when charging WET batteries as there may be battery fluid leakages. The battery fluid is corrosive. If it comes in contact with skin or eyes, rinse thoroughly with water and consult a physician.

1. Drive the machine to the appointed recharging area.
2. Turn off the machine by pressing the switches (41 and 42).
3. For WET batteries only:
 - Remove the recovery water tank as shown in Use chapter. Check the level of electrolyte inside the batteries; if necessary, top up through the caps.
 - Leave all the battery caps open for next charging.
 - If necessary, clean the upper surface of the batteries.
4. Charge the batteries according to one of the following procedures, depending on the presence of the battery charger (48).

Charging the Batteries with an External Battery Charger

5. Check that the external battery charger is suitable by referring to the relevant Manual. The battery charger voltage rating must be 24 V.
6. Disconnect the battery connector (8) and connect it to the external battery charger.
7. Connect the battery charger to the electrical mains.
8. After charging, disconnect the battery charger from the electrical mains and from the battery connector (8).
9. (For WET batteries only): Check the level of electrolyte inside the batteries and close all the caps (39).
10. Connect the battery connector (8) to the machine.
11. (For WET batteries only): Reinstall the recovery tank.

Charging the Batteries with an (Optional) Battery Charger Installed on the Machine

12. Connect the battery charger cable (4) to the electrical mains (the electrical mains voltage and frequency must be compatible with the battery charger values shown on the machine serial number plate (29)).
When the battery charger is connected to the electrical mains, all machine functions are automatically cut off.
If the red warning light (52) on the battery charger control panel stays on, the battery charger is charging the batteries.
13. When the green warning light (50) turns on, the battery charging is completed.
14. When the battery charging is completed, disconnect the battery charger cable (4) from the electrical mains and wind it round its housing (5).
15. (For WET batteries only): Reinstall the recovery tank.



NOTE

For further information about the battery charger (48) operation, see the relevant Manual.

SQUEEGEE CLEANING



NOTE

The squeegee must be clean and its blades must be in good conditions in order to get a good drying.



CAUTION!

It is advisable to wear protective gloves when cleaning the squeegee because there may be sharp debris.

1. Drive the machine on a level floor.
2. Make sure that the switches (41 and 42) are turned to "0".
3. Lower the squeegee (21) with the lever (7).
4. Loosen the handwheels (22) and remove the squeegee (21).
5. Disconnect the vacuum hose (10) from the squeegee.
6. Wash and clean the squeegee (Fig. 6). In particular, clean the compartments (A) and the vacuum hole (B) from dirt and debris. Check the front blade (C) and the rear blade (D) for integrity, cuts and tears; if necessary replace them (see the procedure in the following paragraph).
7. Install the squeegee in the reverse order of removal.

SQUEEGEE BLADE CHECK AND REPLACEMENT

1. Clean the squeegee (Fig. 6) as shown in the previous paragraph.
 2. Check that the edge (E) of the front blade (C) and the edge (F) of the rear blade (D) lay down on the same level, along their length; otherwise adjust their height according to the following procedure:
 - Remove the tie rod (G), disengage the retainers (M) and adjust the rear blade (D); then engage the retainers and install the tie rod.
 - Loosen the handwheels (I) and adjust the front blade (C); then tighten the handwheels.
 3. Check the front blade (C) and rear blade (D) for integrity, cuts and tears; if necessary replace them as shown below. Check that the front corner (J) of the rear blade is not worn; otherwise, overturn the blade to replace the worn corner with an integral one. If the other corners are worn too, replace the blade according to the following procedure:
 - Remove the tie rod (G), disengage the fasteners (M) and remove the retaining strip (K), then replace/overturn the rear blade (D).
 - Install the blade in the reverse order of removal.
 - Unscrew the handwheels (I) and remove the retaining strip (L), then replace the front blade (C).
 - Install the blade in the reverse order of removal.
- After the blade replacement (or overturning), adjust the height as shown in the previous step.
4. Connect the vacuum hose (10) to the squeegee.
 5. Install the squeegee (21) and screw down the handwheels (22).
 6. If necessary, adjust the squeegee balance adjusting handwheel (23).

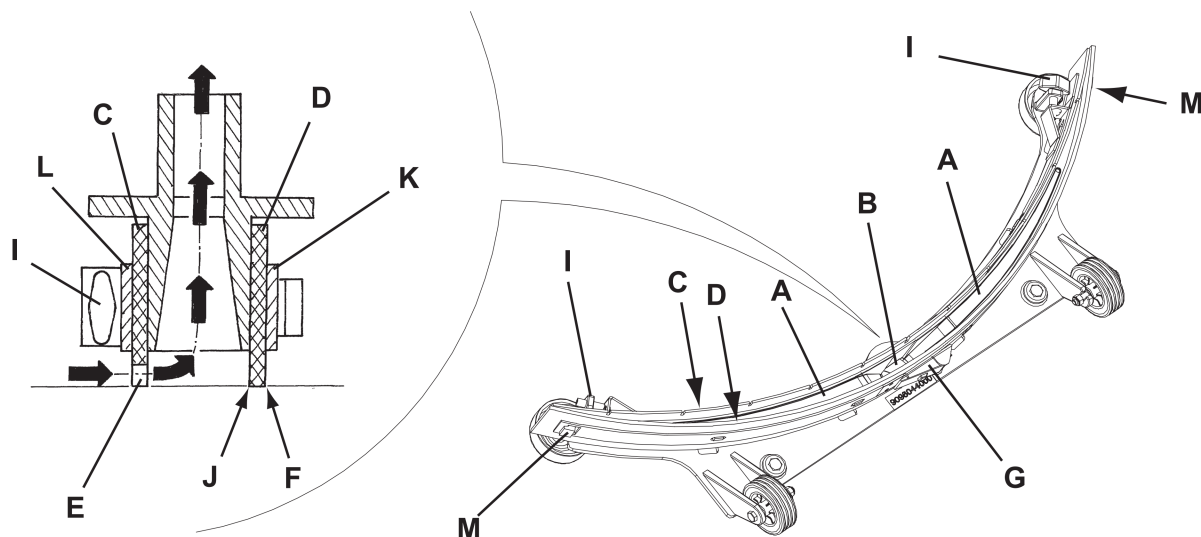


Figure 6

P100666

BRUSH CLEANING



CAUTION!

It is advisable to wear protective gloves when cleaning the brush/pad because there may be sharp debris.

1. Drive the machine on a level floor.
2. Make sure that the switches (41 and 42) are turned to "0".
3. Remove the brush/pad-holder as follows:
 - When the deck (13) is lifted, grab the brush/pad-holder (A, Fig. 7) with the hands and turn it first in one direction (B) and then in the other direction (C) to release it.
4. Clean and wash the brush/pad with water and detergent.
5. Check the brush bristles for integrity and wear; if necessary, replace the brush.
6. Check the pad for wear; if necessary, replace the pad.

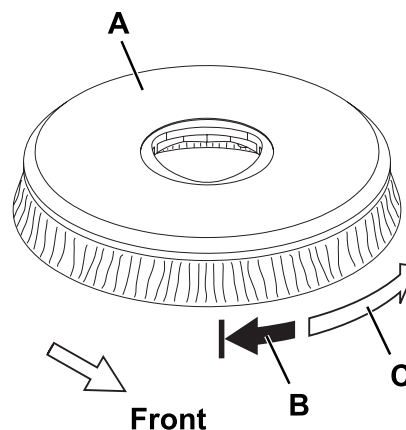


Figure 7

P100667

TANK AND VACUUM GRID CLEANING

1. Drive the machine to the appointed disposal area.
2. Check that the switches (41 and 42) are turned to "0" and disconnect the battery connector (8).
3. Drain the water from the tanks (15 and 16) through the drain hose (11) and hose (12).
4. Open the cover (17), then clean and wash the cover, the tanks and the vacuum grid (30) with clean water.
5. If necessary, remove the grid (A, Fig. 8) clean it carefully and reinstall it.
6. Check the recovery tank cover gasket (B) for integrity.



NOTE

The gasket (B) creates vacuum in the tank that is necessary for vacuuming the recovery water.

If necessary replace the gasket (B) by removing it from its housing. When assembling the new gasket, install the joint (C) in the side area, as shown in the figure.

7. Check that the seating surface (D) of the gasket (B) is integral and adequate for the gasket itself.
8. Close the recovery tank cover (17).

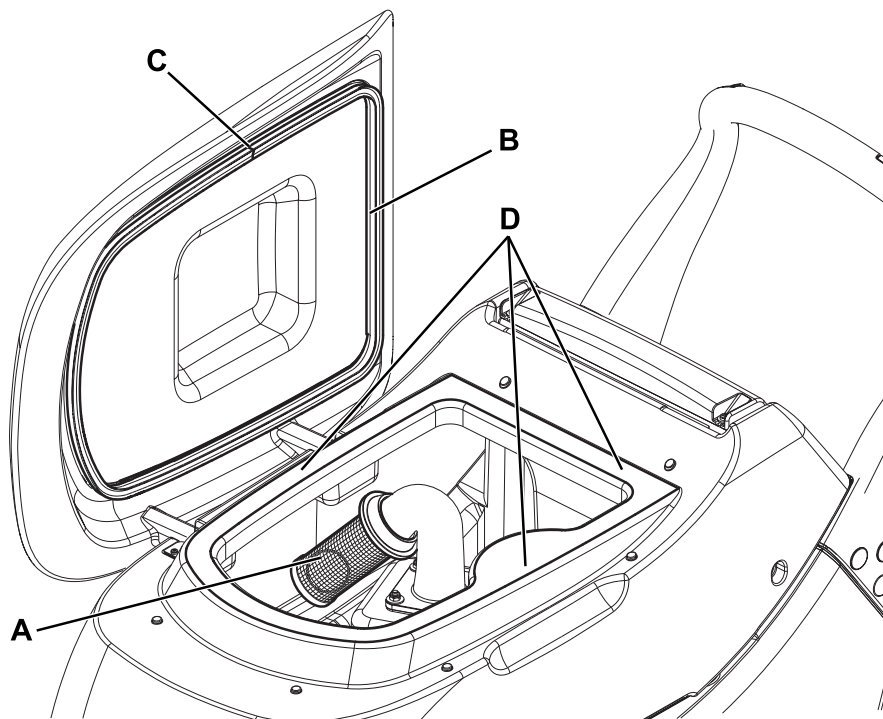


Figure 8

P100668

SOLUTION FILTER CLEANING

1. Empty the solution tank (15) as shown in the relevant paragraph.
2. Drive the machine on a level floor.
3. Check that the switches (41 and 42) are turned to "0" and disconnect the battery connector (8).
4. Unscrew the transparent cover (A, Fig. 9), remove the gasket (B), then remove the filter strainer (C). Clean and install them on the support (D).

**NOTE**

Install the gasket (B) and the filter strainer (C) properly on the cover (A) and on the support (D).

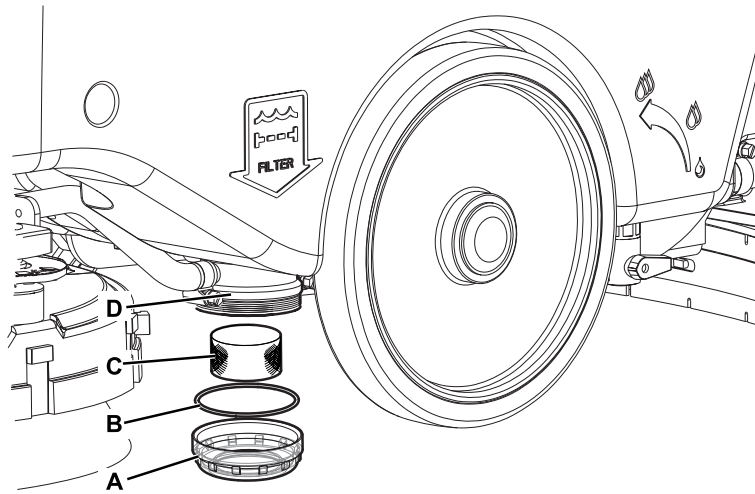
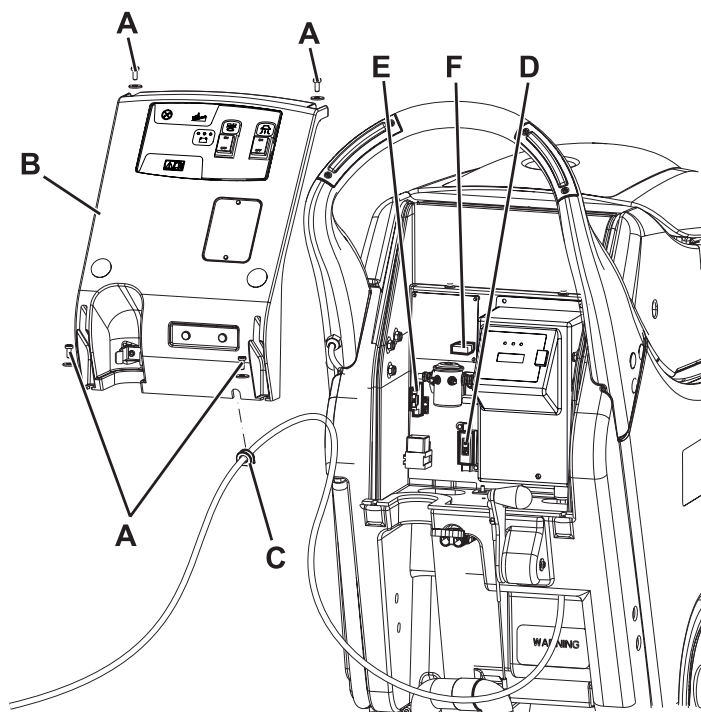


Figure 9

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FUSE CHECK/REPLACEMENT

1. Disconnect the battery connector (8).
2. Move aside the recovery water drain hose (11).
3. Remove the battery charger cable, if equipped, from the cable holder (5).
4. Remove the screws (A, Fig. 10) and carefully move aside the panel (B) by disengaging the grommet (C) from its housing on the panel (B).
5. Check/replace the following fuses:
 - (D) Brush deck motor fuse F1 (40 A)
 - (E) Vacuum system fuse F2 (30 A)
 - (F) Electronic board fuse F3 (5 A)
6. Perform steps 1 to 4 in the reverse order.

**Figure 10**

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TROUBLESHOOTING

Trouble	Possible Cause	Remedy
The motors do not work; no warning light turns on.	The battery connector is disconnected.	Connect.
	The batteries are completely discharged.	Charge the batteries.
	The brush/pad-holder switch is faulty.	Replace. (*)
The LEDs (43) flash simultaneously.	The brush deck motor is overloaded.	Use less aggressive brushes suitable for the floor to be cleaned.
	There are foreign materials (tangled threads, etc.) preventing the brush from rotating.	Clean the brush hub.
The brush does not work.	The fuse (F1) is blown.	Replace.
	The brush activation push-buttons are faulty.	Replace. (*)
The vacuum system motor does not turn on.	The fuse (F2) is blown.	Replace.
	The vacuum system switch is faulty.	Replace. (*)
The dirty water vacuuming is insufficient.	The recovery tank is full.	Empty the tank.
	The hose is disconnected from the squeegee.	Connect.
	The vacuum grid is clogged or the float is stuck closed.	Clean the grid or check the float.
	The squeegee is dirty or the squeegee blades are worn or damaged.	Clean and check the squeegee.
	The tank cover is not properly closed or the gasket is damaged.	Close the cover or clean/replace the gasket.
The solution flow to the brush is insufficient.	The solution solenoid valve is faulty.	Replace. (*)
	The solution filter is dirty.	Clean the filter.
The squeegee leaves marks on the floor.	There are debris under the squeegee blades.	Remove the debris.
	The squeegee blades are worn, chipped or torn.	Replace the blades.
	The squeegee has not been adjusted with the handwheel.	Adjust it.

(*) This maintenance procedure must be performed by an authorised Nilfisk Service Center.



NOTE

If the machine has an optional battery charger installed, the machine cannot operate if the charger is not on board. In case of battery charger malfunction, contact an authorised Service Center.

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
- Brushes/pads
- Plastic hoses and components
- Electrical and electronic components (*)

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