



## Electronic Service Manuals

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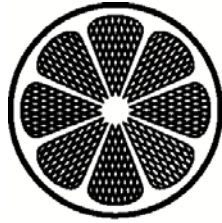
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**IPC Eagle**

**OPERATIONS  
MANUAL**

**CT40ECS**

**CT70ECS**

**CT110ECS**

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## 2. GENERAL INFORMATION



**Read this manual carefully before carrying out any work on the machine<sup>1</sup>.**

### 2.1. Scope of the manual

This manual has been written by the Manufacturer and is an integral part of the machine. It defines the purpose for which the machine has been designed and constructed and contains all the information required by operators<sup>2</sup>.

In addition to this manual containing all user information, other publications are available providing specific information for maintenance personnel<sup>3</sup>.

Constant respect for the instructions guarantees the safety of the operator and the machine, low running costs and high quality results and extends the working life of the machine. Failure to respect the instructions may lead to damage to the operator, machine, floor being washed and environment.

To find the topic that interests you more rapidly, consult the list of contents at the beginning of the manual.

Parts of the text requiring special attention are highlighted in bold and preceded by the symbols illustrated and described here.

### **! DANGER**

**Indicates the need for attention in order to avoid a series of consequences which could cause death or damage to the health of the operator.**

### **👉 IMPORTANT**

**Indicates the need for attention in order to avoid a series of consequences which could cause damage to the machine or work environment or financial loss.**

### **i INFORMATION**

**Particularly important instructions.**

In line with the company's policy of constant product development and updating, the Manufacturer reserves the right to make modifications without warning.

Although your machine may differ appreciably from the illustrations in this document, safety and the information contained in this manual are guaranteed.

### 2.2. Identifying the machine

The rating plate (fig. 1) provides the following information:

- model code;
- model;
- power supply;
- total nominal power;
- serial number;
- year of fabrication;

<sup>1</sup> The definition "machine" replaces the trade name covered by this manual.

<sup>2</sup> Persons responsible for using the machine without performing any operations requiring precise technical skills.

<sup>3</sup> Persons with experience, technical training and a knowledge of legislation and standards, able to perform all the necessary operations and to recognise and avoid possible risks in handling, installation, use and maintenance of this machine.

- dry weight;
- maximum slope;
- barcode with serial number;
- manufacturer's identification.

### 2.3. Documentation provided with the machine

- User manual;
- Guarantee certificate;
- EC certificate of conformity.

## 3. TECHNICAL INFORMATION

### 3.1. General description

This machine is a scrubber drier for sweeping, washing and drying flat, horizontal, smooth or moderately rough, even and obstacle free floors in civil and industrial premises. It is available in both battery and cable versions to meet all running time and weight requirements.

The scrubber drier spreads a solution of water and detergent in the correct concentration on the floor and then scrubs it to remove the dirt. By carefully choosing the detergent and brushes (or abrasive disks) from the wide range of accessories available, the machine can be adapted to a wide range of combinations of types of floor and dirt.

A suction system incorporated in the machine dries the floor after washing by means of the low pressure generated in the dirty water drum by the suction motor. The squeegee connected to the drum collects the dirty water.

The machine is moved forward by:

**MODEL B/C mechanical drive:** the scrubber drier is provided with a special mechanical drive device which exploits the friction between the brush and the floor to generate a forward movement (for further details, see paragraph 6.7).

**MODEL BT electric drive:** the scrubber drier is moved forward by means of a special electromechanical drive device.

### 3.2. Legend

The main parts of the machine are as follows (fig. 2):

- the detergent tank (fig. 2, ref. 7): contains and transports the mixture of clean water and detergent;
- the dirty water drum (fig. 2, ref. 2): collects the dirty water picked up from the floor after washing;
- control panel (fig. 2, ref. 1);
- head assembly (fig. 2, ref. 4): the main element is the brushes (fig. 2, ref. 5) which distribute the detergent solution on the floor and remove the dirt;
- squeegee assembly (fig. 2, ref. 6): wipes and dries the floor by collecting the water.
- head lift pedal (fig. 2, ref. 3): raises the brush head during transport.

### 3.3. Danger zones

A **-Tank assembly:** when using certain detergents, danger of irritation for eyes, skin, mucous membranes and respiratory tract and of asphyxia. Danger represented by the dirt collected from the environment (germs and chemical substances). Danger of crushing between the two tanks when the dirty water drum is replaced on the detergent tank.

B **-Control panel:** danger of short circuit.

C **-Bottom of washing head:** danger due to brush rotation.

D **-Rear wheels:** danger of crushing between the wheel and chassis.

E -**Battery compartment** (in the detergent tank): danger of short circuit between the battery poles and presence of hydrogen during charging.

### 3.4. Accessories

- **Bristle brushes:** for washing delicate floors and polishing;
- **Polypropylene brushes:** for normal floor washing;
- **Tynex brushes:** for removing accumulated stubborn dirt on resistant floors;
- **Drive disks:** enable the following disks to be used:
  - \* Yellow disks: for washing and polishing marble and similar surfaces;
  - \* Green disks: for washing resistant floors;
  - \* Black disks: for thorough washing of resistant floors with stubborn dirt.
- **MICRO SCRUB:** microfibre cleaning system used for normal floor washing;
- **CHEM DOSE** (fig. 15): system for controlling detergent independently from the detergent tank.

## 4. SAFETY INFORMATION

### 4.1. Safety regulations



**Read the "User Manual" carefully before start-up and use or before performing maintenance or any other work on the machine.**

### **IMPORTANT**

**Rigorously respect all instructions in the Manual (in particular those relating to danger and important information) and on the safety plates fitted to the machine. The Manufacturer declines all liability for damage to people or things resulting from failure to observe the instructions.**

The appliance must be used exclusively by persons trained in its use and/or who have demonstrated their ability and have been expressly instructed to use the appliance.

The machine must not be used by minors.

The machine must not be used for purposes other than those for which it was expressly designed. Scrupulously respect all safety standards and conditions applicable to the type of building in which the machine is to be operated (e.g.: pharmaceutical companies, hospitals, chemicals, etc).

Do not use the machine in places with inadequate lighting or explosive atmospheres, on public roads, in the presence of dirt hazardous to health (dust, gas, etc) and in unsuitable environments.

The machine is designed for temperatures of between +4°C and +35°C when in use and between +0°C and +50°C when not in use.

The machine is designed to work in a humidity of between 30% and 95%.

Never use or pick up flammable liquids or explosives (e.g. petrol, fuel oil, etc), flammable gases, dry dusts, acids and solvents (e.g. paint solvents, acetone etc) even if diluted. Never pick up flaming or incandescent objects.

Never use the machine on slopes or ramps of more than 2%. In the case of slight slopes, do not use the machine transversally, always manoeuvre with care and do not reverse. When transporting the machine on steeper ramps or slopes, take the utmost care to avoid tipping up and/or uncontrolled acceleration. Move the machine on ramps and/or steps only with the brush head and squeegee raised.

**Never park the machine on a slope.**

The machine must never be left unattended with the motor or engine on. Before leaving it, turn the motor or engine off, make sure it cannot move accidentally.

Always pay attention to other people, children in particular, present in the place where you are working.

Never use the machine to transport people or things or to tow things. Do not tow the machine.

Never rest objects of any weight on the machine for any reason.

Never obstruct ventilation and heat dispersion slits.

Never remove, modify or circumvent safety devices.

Numerous unpleasant experiences have shown that a wide range of personal objects may cause serious accidents. Before beginning work, remove jewellery, watches, ties, etc.

The operator must always use personal protection devices - protective apron or overalls, non-slip waterproof shoes, rubber gloves, protective goggles and ear protectors and mask to protect the respiratory tract.

Keep the hands away from moving parts.

Never use detergents other than those specified. Follow the instructions on the relative safety sheet. Detergents should be kept out of reach of children. In the event of contact with the eyes, wash immediately with abundant water. If swallowed, consult a doctor immediately.

Make sure the power sockets used for the models with cable or battery charger are connected to a suitable earth system and protected by differential thermal solenoid switches.

Make sure the electrical characteristics of the machine (voltage, frequency, absorbed power) given on the rating plate (fig. 1) are the same as those of the mains electricity supply. The machine with cable has a three-wire cable and a three pin earthed plug for use in an appropriate earthed socket. The earth wire is yellow and green. Never connect this wire to anything other than the earth contact of the socket.

It is indispensable to respect the battery manufacturer's instructions and current legislation. The batteries should always be kept clean and dry to avoid surface leakage current. Protect the batteries from impurities such as metal dust.

Never rest tools on the batteries as this could cause short circuit and explosion.

When using battery acid, always follow the relative safety instructions scrupulously.

When using cable models, take care not to crush or pull the power supply cable. Check this cable periodically for damage. If damaged, the machine must not be used.

In the presence of particularly strong magnetic fields, assess the possible effect on the control electronics.

Never wash the machine with water jets.

The fluids collected contain detergent, disinfectant, water and organic and inorganic material. They must be disposed off in accordance with current legislation.

In the case of malfunction and/or faulty operation, turn the machine off immediately (disconnecting it from the mains power supply or batteries) and do not tamper. Contact a service centre authorised by the Manufacturer.

All maintenance operations must be performed in an adequately lit place and only after disconnecting the machine from the power supply (in cable models by unplugging the machine from the socket, in battery models by disconnecting the batteries).

All work on the electrical system and all maintenance and repair operations other than those explicitly described in this manual must be performed by specialised personnel expert in the sector only.

If the power cable, plug or terminals require replacing, make sure the electrical connections and cable grip inside the control panel are tightly fastened to guarantee the resistance of the cable if pulled. Then replace the panel carefully to guarantee the safety of the operator.

Only original accessories and spare parts supplied by the Manufacturer may be used in order to guarantee safe problem-free operation of the machine. Never use parts removed from other machines or from other kits.

This machine has been designed and constructed to provide ten years' service from the fabrication date shown on the rating plate (fig. 1). After this time, whether the machine has been used or not, it should be disposed of according to current legislation in the country in which it is used:

- the machine must be disconnected from the power supply, emptied of liquids and cleaned;
- the product is classified as WEEE type special waste and is covered by the requisites of the new environmental protection regulations (2002/96/EC WEEE). It must be disposed of separately from ordinary waste in compliance with current legislation and standards.



**Special waste. Do not dispose of with ordinary waste.**

Alternatively the machine must be returned to the Manufacturer for a complete overhaul. If you decide to stop using the machine, you are recommended to remove the batteries and dispose of them at an authorised collection centre. You should also make sure that all parts of the appliance which could represent a hazard, particularly to children, are made safe.

## **5. HANDLING AND INSTALLATION**

### **5.1. Lifting and transporting the packaged machine**

#### **👉 IMPORTANT**

**During all lifting operations, make sure the packaged machine is firmly anchored to avoid it tipping up or being accidentally dropped.  
Always load/unload lorries in adequately lit areas.**

The machine, packaged on a wooden pallet by the Manufacturer, must be loaded using suitable equipment (see EC Directive 2006/42 and subsequent amendments and/or additions) onto the transporting vehicle. At destination, it must be unloaded using similar means.

The squeegees are packed in cardboard boxes without pallet.

A fork lift truck must always be used to lift the packaged body of the machine. Handle with care to avoid knocking or overturning the machine.

### **5.2. Checks on delivery**

When the carrier delivers the machine, make sure the packaging and machine are both whole and undamaged. If the machine is damaged, make sure the carrier is aware of the damage and before accepting the goods, reserve the right (in writing) to request compensation for the damage.

### **5.3. Unpacking**

#### **👉 IMPORTANT**

**When unpacking the machine, the operator must be provided with the necessary personal protection devices (gloves, goggles, etc) to limit the risk of accident.**

Unpack the machine as follows:

- cut and remove the plastic straps using scissors or nippers;
- remove the cardboard;

- remove the bags in the battery compartment (in the detergent tank) and check the contents:
  - guarantee slip;
  - use and maintenance manual;
  - battery bridges with terminals (battery model only);
  - 1 battery charger connector (battery models only);
- depending on the model, remove the metal brackets or cut the plastic straps fixing the machine chassis to the pallet;
- using a sloping ramp, push the machine backwards off the pallet;
- unpack the brushes (fig. 3, ref. 1) and squeegee (fig. 3, ref. 2);
- clean the outside of the machine in respect of safety regulations;
- after unpacking the machine, install the batteries (battery models) or connect the electrical connections (cable models). See relevant sections.

The packaging may be kept as it can be reused to protect the machine if it is moved to another site or to a repair workshop.

Otherwise it must be disposed off in compliance with current legislation.

#### 5.4. Electrical connections and earth (cable models)

The electrical characteristics of the machine are given on the rating plate (fig. 1). Make sure the frequency and voltage correspond to those of the mains supply where the machine will be operated. As far as voltage is concerned, models where the rating plate specifies a voltage of 230 V can be used with voltages of between 220 V and 240 V. Similarly, models rated at 115 V can be used at between 110 V and 120 V. The frequency on the plate must always correspond to the mains voltage.

### IMPORTANT

**Make sure the mains circuit is suitably earthed and that the sockets (and any adaptors used) ensure the continuity of the earth conductors.**

### ! DANGER

**Failure to observe these instructions could cause possibly serious damage to people and things and invalidates the guarantee.**

#### 5.5. Power supply batteries (battery models)

Two different types of battery may be installed on these machines:

- **tubular leak-proof batteries:** the electrolyte level must be checked regularly. When necessary, top up with distilled water until the plates are covered. Do not overfill (5 mm max. above the plates).
- **gel batteries:** this type of battery requires no maintenance.

The technical characteristics must correspond to those indicated in the paragraph on the technical specification of the machine. The use of heavier batteries could seriously jeopardise manoeuvrability and lead to the brush motor overheating. Batteries with a lower capacity and weight will require recharging more frequently.

They must be kept charged, dry and clean and the connections must be tight.

### INFORMATION

Follow the instructions below to set the type of battery installed on the machine's hardware or software.

**Mechanical drive version (B):** on the back of the control panel, move the bridge (fig. 16) to select the type of battery installed on the machine (ACID-LEAD/GEL)

**Electric drive version (BT):** on the back of the control panel, move the bridge (fig. 17) to select the type of battery installed on the machine (ACID-LEAD/GEL)

**CT90-MICRO SCRUB version:** set the machine software to the type of battery installed, following this sequence:

1. turn the machine on by turning the key switch (fig. 6, ref. 15), wait 5 seconds and make sure the display comes on.
2. press the brush buttons (fig. 6, ref. 3) and suction button (fig. 6, ref. 2) together for at least 5 seconds. This accesses the battery setting menu.
3. press the suction button (fig. 6, ref. 2) to select the type of battery installed on the machine "ACd" for acid batteries (tubular leak-proof batteries) or "GEL" (GEL batteries).
4. memorise the displayed parameter by pressing the emergency button (fig. 6 ref. 15).

#### **5.5.1. Batteries: preparation**

### **! DANGER**

**While installing or performing maintenance on the batteries, the operator must be provided with the necessary personal protection devices (gloves, goggles, overalls, etc) to limit the risk of accident. Keep away from naked flames, avoid short circuiting the battery poles, avoid sparks and do not smoke.**

The batteries are normally supplied filled with acid and ready for use.

If the batteries are dry, before mounting them on the machine, proceed as follows:

- remove the caps and fill all elements with specific sulphuric acid solution until the plates are entirely covered (this requires at least a couple of passes for each element);
- leave for 4-5 hours to allow the air bubbles to come to the surface and the plates to absorb the electrolyte;
- make sure the level of electrolyte is still above the plates and if necessary top up with sulphuric acid solution;
- close the caps;
- mount the batteries on the machine (following the procedure described below).

Before starting up the machine for the first time, charge the batteries. Follow the instructions in the relevant section.

#### **5.5.2. Batteries: installation and connection**

### **! DANGER**

**Check that all switches on the control panel are in the "0" (off) position.**

**Make sure you connect the terminals marked with a "+" to the positive poles of the battery. Do not check the battery charge by sparking.**

**Follow the instructions given below meticulously as short circuiting the batteries could cause them to explode.**

1. Make sure the two tanks are empty (if necessary, empty them. See the relevant paragraph).
2. Release the dirty water drum (fig. 2, ref. 2) from the detergent tank (fig. 2, ref. 7) by pulling the catch (fig. 4, ref. 1).
3. Lift the dirty water drum and tilt it backwards by about 90°. This provides access to the battery compartment (in the detergent tank) from above.
4. Place the batteries in the compartment in the direction shown in the drawing printed inside the compartment on the detergent tank.

## IMPORTANT

**Mount the batteries on the machine using lifting means suitable for their weight.  
The positive and negative poles have different diameters.**

- 5) Referring to the wiring layout shown in the above diagram, connect the battery cable and bridge terminals to the battery poles.  
Arrange the cables as shown in the diagram, tighten the terminals on the poles and cover with Vaseline.
- 6) Lower the dirty water drum into its work position and fasten it to the detergent tank;
- 7) When using the machine, follow the instructions below.

### 5.6. Battery charger (battery models)

## IMPORTANT

**Never allow the batteries to become excessively flat as this could damage them irreparably.**

#### 5.6.1. *Choosing the battery charger*

Make sure the battery charger is compatible with the batteries to be charged:

- **tubular lead batteries:** a 24V - 20 A automatic charger is recommended. Consult the battery charger manufacturer and manual to confirm the choice.
- **gel batteries:** use a charger specific for this type of battery.

#### 5.6.2. *Preparing the battery charger*

If you wish to use a battery charger not provided with the machine, you must fit it with the connector supplied with the machine (see paragraph "Unpacking" of this manual).

To install the connector, proceed as follows:

- remove about 13 mm of protective sheath from the red and black wires of the battery charger;
- insert the wires into the connector contacts and squeeze them forcefully with suitable pliers;
- respect the polarity (red wire + black wire -) when inserting the wires into the connector.

### 5.7. Lifting and transporting the machine

## IMPORTANT

**All phases must be performed in an adequately lit room and adopting the safety measures most appropriate to the situation.**

**The operator must always use personal protection devices.**

To load the machine onto a means of transport, proceed as follows:

- empty the dirty water drum and detergent tank;
- remove the squeegee and brushes (or drive disks);
- remove the batteries (in battery models);
- place the machine on the pallet and fix it with plastic straps or metal brackets;
- lift the pallet (with the machine) using a fork lift truck and load it onto the means of transport;
- anchor the machine to the means of transport with cables connected to the pallet and machine itself.

## 6. PRACTICAL GUIDE FOR THE OPERATOR

### 6.1. Controls - Description

With reference to fig. 6, the machine has the following controls and indicator lights:

- **Power on light** (fig. 6, ref. 1 - **cable model** only): green, indicates that the power cable of the machine is connected to the mains.
- **Battery charge light** (fig. 6, ref. 1 – **battery model only**): 3 yellow LEDs, indicates the battery charge level. There may be:
  - a) **3 LEDs on**: batteries 100% to 50% charged;
  - b) **2 LEDs on**: batteries 50% to 18% charged;
  - c) **1 LED on**: batteries almost flat.
  - d) **1 LED flashing**: batteries completely flat; after a few seconds the brushes stop and the brush switch light also comes on.
- **Main key switch - emergency button** (fig. 6, ref. 15): enables and disables power to all machine functions. Acts as a safety device. To start up the machine, turn the key clockwise. To stop the machine press the button.
- **Brush button with light** (fig. 6, ref. 3): enables (LED on) or disables (LED off) the "Brush" function. If the machine is fitted with the optional MICRO SCRUB system, holding the button down for at least 3 seconds selects the machine operating mode, with microfibre (MICRO SCRUB) or with brush/abrasive disc.
- **Suction button with light** (fig. 6, ref. 2): switches the suction motor responsible for drying the floor being washed on ("LED on") or off ("LED off"). The light is on when there is power to the suction motor.
- **Tap lever** (fig. 6, ref. 6): provides continuous control of the flow of detergent to the brushes. Pull up to increase the liquid outflow.
- **Drive lever** (fig. 6, ref. 7): the drive lever moves the machine forwards and rotates the brushes.
- **Squeegee lever** (fig. 6, ref. 8): raises (when lifted) or lowers (when pushed down) the squeegee.
- **Direction adjustment knob** (fig. 6, ref. 10): turn to correct any deviation of the machine from a straight line.
- **Head lowering/raising pedal** (fig. 6, ref. 9): on the left side of the machine, when pressed it lowers/raises the brush head.
- **Detergent tank level indicator** (fig. 6, ref. 5): the LED comes on to indicate insufficient water in the detergent tank.
- **Dirty water drum level indicator** (fig. 6, ref. 4): when the dirty water drum is full the LED comes on and after a few seconds the suction motor shuts down.
- **Display**: displays any alarms active. During normal operation, it displays the hour counter (giving the actual number of hours the machine has been operating).
- **Direction selection button (CT40 - CT70 electric drive)** (fig. 6, ref. 13): sets movement of the machine to forwards or reverse.
- **Alarm indicator (CT90 - MICRO SCRUB)** (fig. 6, ref. 16), depending on the frequency the LEDs come on, defines the board error code (see chapter 10). When operating without malfunction, the LED is on steadily.
- **Speed control potentiometer (CT40 electric drive - CT70 electric drive - CT90)** (fig. 6, ref. 11), turning the potentiometer sets machine speed.
- **Pressure control light OPTIONAL MICRO SCRUB** (fig. 6, ref. 17): consists of 3 green LEDs and 1 red LED indicating the pressure of the microfibre on the work surface. There may be:
  - a) **1 green LED on**: minimum pressure;
  - b) **2 green LEDs on**: medium pressure;
  - c) **3 green LEDs on**: maximum permitted pressure;
  - d) **3 green LEDs + 1 red LED on**: excessive microfibre pressure. The light is accompanied by a beep.

## 6.2. Mounting and adjusting the squeegee

The squeegee (fig. 2, ref. 6) is responsible for the first phase of drying.

To mount the squeegee on the machine, proceed as follows:

- 1) check that the squeegee mount (fig. 7, ref. 2) is raised, otherwise lift it by means of the squeegee lever (fig. 7, ref. 5);
- 2) insert the suction hose sleeve (fig. 7, ref. 4) fully into the squeegee;
- 3) slacken the two knobs (fig. 7, ref. 3) at the centre of the squeegee;
- 4) insert the two threaded pins into the slots on the support (fig. 7, ref. 2);
- 5) fix the squeegee by tightening the two knobs (fig. 7, ref. 3).

The squeegee blades scrape the film of water and detergent from the floor and prepare the way for perfect drying. With time, the constant rubbing makes the edge of the blade in contact with the floor rounded and cracked, reducing the drying efficiency and requiring it to be replaced. The state of wear should be checked frequently.

For perfect drying, the squeegee must be adjusted in such a way that the edge of the rear blade bends during operation by about 45° with respect to the floor at every point. Adjust the angle of the blade during operation by regulating the height of the two wheels positioned behind the squeegee (fig. 7 ref. 1).

## 6.3. Moving the machine when not in operation

To move the machine, proceed as follows:

- 1) raise the squeegee;
- 2) push the head pedal down then to the right (fig. 6 ref. 9) to raise the head;
- 3) move the machine as follows:
  - **Versions with mechanical drive:** push or pull;
  - **Versions with electric drive (CT40 – CT70 only):** to move the machine forwards, press the button (fig. 6 ref. 13), (LED fig. 6 ref. 14 on) and then operate the drive lever (fig. 6 ref. 7). To move the machine backwards, press the button (fig. 6 ref. 13) again, (LED fig. 6 ref. 12 on), then operate the drive lever (fig. 6. ref. 7);

speed can be varied by the potentiometer knob (fig. 6. ref. 11).

**Versions with electric drive (CT90 only):** to move the machine forwards/backwards, move the selector (fig. 6, ref. 13), then use the drive lever (fig. 6. ref. 7). Speed can be varied by the potentiometer knob (fig. 6. ref. 11).

- 4) once you have reached your destination, lower the head by pressing the release pedal (fig. 6 ref. 9) down and to the left, then release it.

### IMPORTANT

**Do not leave the machine unattended or parked with the head lifted or the key inserted in the emergency button.**

## 6.4. Mounting and changing the brush/drive disks

### IMPORTANT

**Never work without the brushes and drive disks perfectly installed.**

**Fitting the brush (one brush version):** Rest the brush on the floor in front of the machine and centre it with the guard. Lower the head and repeatedly action the brush/drive control lever (fig. 6, ref. 7) until the brush automatically engages on the flange hub. If the manoeuvre is not successful, press on the handle again and repeat the centring and repeated actioning of the brush/drive lever.

Use of abrasive/microfibre disks: fit the abrasive/microfibre disk on the drive disk and perform the operations described for fitting the brush on the scrubber drier.

**Removing the brush (one brush version) (or drive disk):**

Raise the machine head by pushing the head lift pedal down and then to the right (fig. 6, ref. 9) and repeatedly action the brush/drive lever. After a few pulses, the brush/es (or drive disk) is released and falls to the ground.

### **Fitting the brushes (two brush version):**

Place the brushes under the head drive disk.

Lift the right brush with your hands and turn it clockwise, locking it in position on the drive disk. Lift the left brush with your hands and turn it anticlockwise, locking it in position on the drive disk.

Use of abrasive/microfibre disks: fit the abrasive/microfibre disk on the drive disk and perform the operations described for fitting the brush on the scrubber drier.

### **Removing the brushes (two brush version) (or drive disk):**

Raise the machine head by pushing the head lift pedal down and then to the right (fig. 6, ref. 9). Turn the right brush anticlockwise, releasing it from the drive disk. Turn the left brush clockwise, releasing it from the drive disk.

## **6.5. Detergents – Instructions**

### **IMPORTANT**

**Always dilute the detergent according to the manufacturer's instructions. Do not use sodium hypochlorite (bleach) or other oxidants, particularly in strong concentrations. Do not use solvents or hydrocarbons. The temperature of the water and detergent must not exceed the maximum indicated in the technical specification. They must be free of sand and/or other impurities.**

The machine has been designed for use with low-foam biodegradable detergents made specifically for scrubber driers.

For a complete and up-to-date list of the detergents and chemicals available, contact the Manufacturer.

Use products suitable for the floor and dirt to be removed only.

Follow the safety regulations on use of detergents given in the section "Safety regulations".

## **6.6. Preparing the machine for work**

### **IMPORTANT**

**Before starting work, wear overalls, ear protectors, non-slip waterproof shoes, mask to protect the respiratory tract, gloves and all other personal protection devices recommended by the supplier of the detergent used or necessitated by the work environment.**

Before starting work, proceed as follows:

- ***Battery models:*** check the battery charge (recharge if necessary);
- lower the head by means of the pedal (fig. 6, ref. 9);
- make sure the dirty water drum (fig. 2, ref. 2) is empty. If necessary, empty it;
- check that the tap lever (fig. 6, ref. 6) is in the "CLOSED" position;
- via the opening at the front, fill the detergent tank (fig. 2, ref. 7) with a suitable concentration of clean water and low-foam detergent. Leave at least 5 cm between the surface of the liquid and the opening of the tank;
- if the machine is fitted with the optional CHEM DOSE accessory, remove the cap and fill the tank (fig. 15, ref. 1) with appropriately diluted low-foam detergent.
- mount the most suitable brushes or drive disks for the floor and work to be performed (see paragraph 3.4);
- make sure the squeegee (fig. 2, ref. 6) is firmly attached and connected to the suction hose (fig. 7, ref. 4). Make sure the back blade is not worn.

### **i INFORMATION**

**If you are using the machine for the first time, we recommend trying it on a large obstacle-free surface first to acquire the necessary familiarity.**

**Always empty the dirty water drum before filling the detergent tank again.**

For effective cleaning and to extend the working life of the machine, follow a few simple rules:

- prepare the work area by removing all possible obstacles;
- begin working from the furthestmost point to avoid walking on the area you have just cleaned;
- choose the straightest possible working routes;
- divide large floors into parallel rectangular sections.

If necessary, finish off by passing a mop or rag rapidly over parts inaccessible to the scrubber drier.

## 6.7. Working

After setting up the machine, proceed as follows:

- Connect the machine as follows:
  - ***cable model***: plug the machine into the mains power socket;
- move the tap lever (fig. 6, ref. 6) to the minimum detergent flow position. Unless a safety solenoid valve is fitted, the detergent solution starts flowing to the brush;
- lower the squeegee by means of the corresponding lever (fig. 6, ref. 8);
- press the brush switch (fig. 6, ref. 3). If the machine is set to also operate using the MICRO SCRUB system, select the most suitable operating mode (brush/pad mode or MICRO SCRUB mode) by holding the brush switch down for at least 3 seconds;
- press the suction switch (fig. 6, ref. 2) to start the suction motor;
- press the brush/drive lever (fig. 6, ref. 7);
- **Versions with mechanical drive**: When the brush switch is in the "1" position and the drive lever is pulled, the motor which turns the brush and moves the machine starts up. A special mechanical drive device uses the friction between the brush and floor to generate a forward movement. When the mechanical drive lever is released, the brush motor shuts down and the machine stops.

If the machine pulls to one side, restore a straight course by using the direction regulation knob (fig. 6, ref. 10). If the machine pulls to the right, turn the knob clockwise and vice versa.

- **Versions with electric drive**: to move forwards or backwards, see paragraph 6.3.

### In both versions:

- periodically check that the detergent is reaching the brushes and refill when it runs out. When there is no longer sufficient water in the detergent tank, the level indicator lights up (fig. 6, ref. 5). Stop and fill the tank;
- If the machine is fitted with the optional CHEM DOSE accessory, press the button (fig. 15, ref. 2) to turn the device on, then adjust the detergent mixture to send to the brushes using the regulation screw (fig. 15, ref. 3). The quantity can be adjusted from 0.5% to 3% per litre of water.
- during work check the cleaning quality and adjust the detergent flow to the brushes by raising or lowering the lever (fig. 6, ref. 6) as required.
- When using the machine in optional MICRO SCRUB mode, the flow control lever must be completely lowered (valve closed).
- on certain models, the pressure of the brushes on the work surface can be adjusted using knob (fig. 14, ref. A) shown in the drawing. To access the knob, lift the dirty water drum. Turn the knob clockwise to increase the pressure of the brushes on the work surface, turn it anticlockwise to reduce the pressure of the brushes on the work surface.
- If you are using the machine in optional MICRO SCRUB mode, make sure the pressure of the microfibre on the work surface is within the permitted operating range - 1 green LED on, minimum pressure; 2 green LEDs on, medium pressure; 3 green LEDs on, maximum pressure (fig. 6, ref. 17). If the 3 green LEDs and the red LED (fig. 6, ref. 17) come on during operation, you must reduce brush pressure using the adjustment knob (fig. 14, ref. A) until it is within the permitted pressure value.

## **IMPORTANT**

**Empty the dirty water drum each time you fill the detergent tank.  
Never leave the suction motor on and detergent tap open when parked.**

- when the dirty water drum is full, the level indicator comes on (fig. 6, ref. 4) and after a few seconds the suction motor shuts off. You must stop working and empty the tank. To restart the suction motor, turn the suction switch (fig. 6, ref. 2) off and then on again.
- **Battery models:** if the warning LED (fig. 6, ref. 1) starts flashing, it means that the batteries are almost flat. After a few seconds the brushes shut down to prevent excessive discharge of the batteries. Recharge.

### **At the end of work:**

- place the tap lever (fig. 6, ref. 6) in the "CLOSED" position;
- release the brush/drive lever (fig. 6, ref. 7) located under the handgrip. This turns the brush/drive motor off and the machine stops;
- stop the brush (fig. 6, ref. 3);
- lift the lever (fig. 6, ref. 8) to raise the squeegee from the floor to prevent the continuous pressure from warping the blades;
- let the suction motor run for at least 2 minutes to make sure it is completely dry, then press "0" on the suction switch (fig. 6, ref. 2) to switch off the suction motor;
- remove the brushes (or drive disks) to prevent them from warping permanently;
- press the button to turn the optional CHEM DOSE accessory off (fig. 15, ref. 2)
- depending on the model, unplug the machine or disconnect the ANDERSON connectors (fig. 5, ref. 1 and ref. 2);
- empty and clean the dirty water drum.

## **6.8. Some useful tips to get the most from your scrubber drier**

In the event of particularly stubborn dirt on the floor, washing and drying can be performed in two separate operations.

### **6.8.1. Prewashing using brushes or pads**

- Open the water tap;
- place the brush switch in position "1";
- lower the head;
- operate the drive lever to rotate the brushes;
- make sure the suction motor is off and the squeegee is raised;
- begin washing.

The flow of water must be adjusted in proportion to the desired advance speed. The slower the machine moves forwards, the less water is needed.

Persist when washing particularly dirty points to give the detergent time to perform its mechanical action detaching and suspending the dirt and the brushes time to exert an effective mechanical action.

### **6.8.2. Drying**

Lower the squeegee and with the suction motor on, pass over the same area washed previously. The result is equivalent to in-depth washing and subsequent ordinary maintenance will take less time.

To wash and dry at the same time, operate the brush, water, squeegee and suction motor simultaneously.

## 6.9. Draining the dirty water

### ! DANGER

Use suitable personal protection devices.

**Drain the dirty water with the machine disconnected from the power supply.**

The dirty water drum drain hose is at the back left side of the machine.

To empty the drum:

- move the machine near a drain;
- detach the drain hose (fig. 8, ref. 2) from its seat by holding it near the fixing spring (fig. 8, ref. 3) and pulling horizontally;
- keeping the hose end as high as possible, unscrew and remove the cap (fig. 8, ref. 4);
- lower the hose end gradually, controlling the intensity of the flow of water by adjusting the height from the ground;
- check the amount of dirt left in the dirty water drum and if necessary wash it out. To facilitate cleaning and complete emptying of the drum, you are recommended to unfasten and lift it;
- when the dirty water has been totally drained, lower the dirty water drum (if previously lifted) and refasten to the detergent tank;
- close the drain hose (fig. 8, ref. 2) by replacing the cap (fig. 8, ref. 4), check that it is tightly closed and replace the hose in its housing.

### 👉 IMPORTANT

**When washing the dirty water drum, never remove the suction filter (fig. 10, ref. 2) from its housing and never direct the jet of water against the filter itself.**

You are then ready to wash and dry again.

## 6.10. Draining the clean water

### ! DANGER

Use suitable personal protection devices.

**Drain the water with the machine disconnected from the power supply.**

To empty the tank:

- move the machine near a drain;
- remove the cap (fig. 9, ref. 1);
- when the detergent tank is completely empty, replace the cap (fig. 9, ref. 1).

### i INFORMATION

**The water and detergent solution can also be used to wash the dirty water drum.**

## 7. PERIODS OF INACTIVITY

If the machine is not used for some time, remove the squeegee and brushes (or drive disks), wash them and put them away in a dry place (preferably in a bag or wrapped in plastic film) away from dust. Park the machine with the head lowered.

Make sure the tanks are completely empty and perfectly clean.

Disconnect the machine from the power supply (depending on the model, unplug from the mains or disconnect the ANDERSON connector from the battery wiring).

**Battery models:** Completely recharge the batteries before storing them. During long periods of inactivity, you should charge the batteries regularly (at least once every two months) to keep them constantly at maximum charge.

### 👉 IMPORTANT

**If you do not charge the batteries regularly, they may be irrevocably damaged.**

## 8. BATTERY MAINTENANCE AND CHARGING

### ! DANGER

**Do not check the battery by sparking.**

**The batteries give off flammable fumes. Put out all fires and hot embers before checking or topping up the batteries.**

**Perform the operations described above in a ventilated room.**

To avoid permanent damage to the batteries, do not run them down completely. Remember that when the corresponding red LED (fig. 6, ref. 1) flashes on the control panel, you must charge the batteries.

### 8.1. Recharging procedure

- connect the battery charger connector to the battery wiring connector (fig. 5, ref. 1);

### 👉 IMPORTANT

**In the case of gel batteries, use a charger specific for gel batteries only.**

- Charge the batteries as described in the battery charger manual;
- at the end of charging, disconnect the connectors;
- reconnect the battery wiring connector to the machine connector.

## 9. MAINTENANCE INSTRUCTIONS

### ! DANGER

**Never perform any maintenance operations without first unplugging the machine from the mains (cable version) or disconnecting the batteries.**

**Maintenance on the electrical circuit and all other operations not explicitly described in this manual must be performed by specialised personnel only, in compliance with current safety legislation and as described in the maintenance manual.**

### 9.1. Maintenance - General rules

Performing regular maintenance according to the Manufacturer's instructions improves performance and extends the working life of the machine.

When cleaning the machine, respect the following:

- avoid the use of high pressure washers. Water could penetrate the electrical compartment or motors leading to damage or the risk of short circuit;
- do not use steam to avoid the heat warping plastic parts;
- do not use hydrocarbons or solvents as they could damage the cowling and rubber parts.

### 9.2. Routine maintenance

#### 9.2.1 Suction motor air filter and float switch: cleaning

- Unscrew and remove the tank cap (fig. 10, ref. 1) from the dirty water drum (fig. 10, ref. 4);
- make sure the dirty water drum (fig. 10, ref. 4) is empty;
- clean the float switch (fig. 10, ref. 5) at the back of the dirty water drum, taking care not to direct the water jet directly against the float switch;
- remove the suction motor air filter (fig. 10, ref. 2) from the float switch support (fig. 10 ref. 3) inside the dirty water drum at the top;
- clean the filter with running water or the detergent solution used on the machine;

- dry the filter thoroughly before replacing it in the support. Make sure the filter is correctly located in its housing;
- screw the cap back on the dirty water drum.

### **9.2.2 Basket filter: cleaning**

- Remove the basket filter from the water fill hole at the front of the machine;
- clean the filter with running water or the detergent solution used on the machine;
- replace the filter back in its housing, making sure it is correctly positioned.

### **9.2.3 Detergent filter: cleaning**

- Unscrew the screw located below the bottom tank (fig. 11, ref. 1);
- unscrew the detergent filter (fig. 11, ref. 2);
- clean the filter with running water or the detergent solution used on the machine;
- replace the filter back in its housing, making sure it is correctly positioned and retighten the screw.

### **9.2.4 Squeegee blades: replacing**

The squeegee blades collect the film of water and detergent from the floor and prepare the way for perfect drying. With time, the constant rubbing leaves the edge of the blade in contact with the floor rounded and cracked, reducing the drying efficiency and requiring it to be replaced.

#### **Turning or replacing the blades:**

- lower the squeegee by means of the corresponding lever (fig. 6, ref. 8);
- remove the squeegee (fig. 2 ref. 6) from its mount (fig. 7 ref. 2) by completely unscrewing the two knobs (fig. 7 ref. 3)
- remove the suction hose sleeve (fig. 7, ref. 4) from the squeegee;
- release the catch (fig. 12 ref. 3 or 6);
- remove the two blade retainers (fig. 12 ref. 2 or 7) by first pushing them towards the body of the squeegee (fig. 12 ref. 1) then extracting them;
- remove the blade (fig. 12 ref. 4 or 5);
- reuse the same blade by reversing the edge in contact with the floor until all four edges are worn out, or replace with a new blade, fitting it onto the screws on the body of the squeegee (fig. 12 ref. 1);
- reposition the two blade retainers (fig. 12 ref. 2 or 7) by centring the widest part of the slots over the fixing screws on the squeegee body (fig. 12 ref. 1), then pushing the blade retainers inwards;
- refasten the catch (fig. 12, ref. 3 or 6).

Replace the squeegee in its support following the instructions in paragraph 6.2.

### **9.2.5 Fuses: replacement (battery models)**

The fuses protecting the brush and suction motors are located in the fuse holder (fig. 13, ref. 1) attached to the dirty water drum above the machine battery compartment.

To replace the fuses:

- make sure the dirty water drum is empty and empty if necessary;
- raise the dirty water drum;
- raise the fuse holder cover and remove the fuse by unscrewing the fixing screws;
- fit a new fuse and close the fuse holder cover;
- lower the dirty water drum.

**Fuse table:** For the complete fuse table, see the spare parts catalogue.

## **IMPORTANT**

**Never use a fuse with a higher amperage than specified.**

If a fuse continues to blow, the fault in the wiring, boards (if present) or motors must be identified and repaired. Have the machine checked by qualified personnel.

### **9.3. Routine maintenance**

#### **9.3.1. Daily operations**

After each day's work, proceed as follows:

- disconnect the machine from the power supply;
- empty the dirty water drum and clean if necessary;
- clean the squeegee blades and check for wear. If necessary, replace.
- check that the suction hole in the squeegee is not blocked. If necessary remove encrusted dirt;
- **Battery model:** recharge the batteries according to the procedure described.

#### **9.3.2. Weekly operations**

- Clean the dirty water drum float switch and make sure it is working correctly;
- clean the suction air filter and make sure it is undamaged. If necessary, replace.
- clean the detergent filter at the front opening of the detergent tank (fig. 2, ref. 7) and check that it is not damaged (replace if necessary);
- clean the suction hose;
- clean the dirty water and detergent tanks;
- **Battery model:** check the level of battery electrolyte and top up with distilled water if necessary.

#### **9.3.3. Six monthly operations**

Have the electrical circuit checked by qualified personnel.

# 10. TROUBLESHOOTING

## 10.1. How to resolve possible problems

[B]= battery machines

[C]= cable machines

[BT]= battery machines with electric drive

Possible problems affecting the whole machine.

PROBLEM	CAUSE	REMEDY
<b>The machine does not function</b>	• [B]= battery connector disconnected	• [B]= connect the batteries to the machine
	• [B]= the batteries are flat	• [B]= recharge the batteries
	• [C]= the machine is not plugged into the mains socket	• [C]= plug into the mains socket
<b>The brushes do not turn</b>	• [B]= place the brush switch in the "0" position;	• place the brush switch in the "1" position;
	• [BT]= you have not used the brush switch	• press the brush switch
	• you have not pressed the brush lever	• press the brush lever
	• [B]= the motor thermal cutout has tripped; the motor is overheated	• [B]= release the brush lever, turn the brush switch to the "0" position (off); leave the machine to cool down for at least 45'
	• [B], [BT]= the power supply or motor thermal cutout connectors are disconnected	• [B], [BT]= reconnect the power supply or motor thermal cutout connectors
	• [C]= the motor power supply connector is disconnected	• [C]= reconnect the motor power supply connector
	• [B] [BT]= the brush motor fuse has blown	• [B] [BT]= have someone check and eliminate the causes responsible for the blown fuse, then replace
	• [B] [BT]= the batteries are flat	• [B] [BT]= recharge the batteries
	• the reduction unit is faulty	• have the reduction unit replaced
	• the motor is faulty	• have the motor replaced
<b>The brush motor has trouble in starting (<i>cable models</i> only)</b>	• you are working with a dry brush on a very rough floor	• open the detergent tap
	• you are working with power cable extensions with an inadequate section, or the voltage is considerably lower than the rated value for the scrubber as shown on the rating plate (15% less)	• avoid the use of inappropriate extensions. Increase the section of the electric wires and locate sockets with a higher voltage
	• the motor is faulty	• have the motor replaced
<b>The machine does not clean evenly</b>	• the brush or disks are worn	• replace

<b>No detergent is delivered</b>	• the tap lever is in the "CLOSED" position	• move the lever to the "OPEN" position
	• the detergent tank is empty	• fill it
	• the hose delivering the detergent to the brush is blocked	• unblock and open the circuit
	• the tap is dirty or faulty	• clean or replace the tap by unscrewing the screw (ref. 1 fig. 11)
<b>The detergent flow does not stop</b>	• the tap stays open, because it is damaged or very dirty	• have the tap cleaned or replaced
<b>The suction motor does not start</b>	• the suction switch is in the '0' position (off)	• turn the suction switch on
	• there is no power to the suction motor or the motor is faulty	• check that the motor power connector is correctly connected to the main wiring; in the second case have the motor replaced
	• <b>[B] [BT]=</b> the fuse has blown	• <b>[B] [BT]=</b> replace the fuse
<b>The squeegee does not clean or suction is ineffective</b>	• the edge of the rubber blades in contact with the floor is worn	• replace the rubber blade
	• the squeegee or hose is blocked or damaged	• unblock and repair the damage
	• the float switch has tripped (dirty water drum), is clogged by dirt or broken	• empty the dirty water drum or reset the float switch
	• the suction hose is blocked	• unblock the hose
	• the suction hose is not connected to the squeegee or is damaged	• connect or repair the hose
	• there is no power to the suction motor or the motor is faulty	• check that the motor power connector is correctly connected to the main wiring and that the fuse is not blown; in the second case have the motor replaced
<b>The machine does not move</b>	• there is no power to the brush/drive motor or it is faulty	• in the first case, place the brush switch in the "1" position and press the brush/drive lever; in the second case, check that the brush/drive motor is correctly connected to the main wiring; in the third case replace the motor CT90, drive motor electronic board protection activated, check the type of alarm present on the board (see chapter 11)
	• the reduction unit is broken (therefore the brush does not turn)	• have the reduction unit replaced
	• the brush motor thermal cutout has tripped; the motor is overheated	• stop the machine, turn it off and leave it to cool for at least 45'
	• <b>[B] [BT]=</b> the batteries are flat and the brushes have shut down	• <b>[B] [BT]=</b> recharge the batteries

<p><b>The machine tends to pull to one side</b></p>	<ul style="list-style-type: none"> <li>• the direction adjustment knob must be adjusted appropriately for the floor</li> </ul>	<ul style="list-style-type: none"> <li>• regulate the direction of movement by adjusting the direction adjustment knob</li> </ul>
<p><b>The batteries do not provide the normal work time (<u>battery models only</u>)</b></p>	<ul style="list-style-type: none"> <li>• the battery poles and charging terminals are dirty and oxidised</li> <li>• the electrolyte level is low</li> <li>• the battery charger does not work or is unsuitable</li> <li>• there are considerable differences in density between the various elements of the battery</li> <li>• you are using the machine with excessive pressure on the brushes</li> <li>• there are considerable differences in density between the various elements of the battery</li> </ul>	<ul style="list-style-type: none"> <li>• clean and grease the poles and terminals, recharge the batteries</li> <li>• top up all the elements with distilled water as described in the instructions</li> <li>• see battery charger instructions</li> <li>• replace the damaged battery</li> <li>• reduce pressure on the brush</li> <li>• replace the damaged battery</li> </ul>
<p><b>The battery discharges too fast during use, even though it has been charged correctly and when tested with a hydrometer at the end of recharging, it turned out to be uniformly charged (<u>battery models only</u>)</b></p>	<ul style="list-style-type: none"> <li>• the battery is new and does not deliver 100% of its expected capacity</li> <li>• the machine is being used at maximum capacity for continuous periods and the working time is not sufficient</li> <li>• the electrolyte has evaporated and does not cover the plates completely</li> </ul>	<ul style="list-style-type: none"> <li>• the battery must be "run-in" by performing 20-30 charges and discharges to obtain maximum performance</li> <li>• if possible, use batteries with a higher capacity or replace the batteries with others charged previously</li> <li>• top up all elements with distilled water until the plates are covered then recharge the battery</li> </ul>
<p><b>The battery discharges too fast during use, recharging with an electronic battery charger is too fast and after recharging the battery supplies the right voltage (about 2.14V for each element without load), but when tested with a hydrometer is found not to be uniformly charged (<u>battery models only</u>)</b></p>	<ul style="list-style-type: none"> <li>• the battery supplied filled with acid by the Manufacturer has been stored for too long before being recharged and used for the first time</li> </ul>	<ul style="list-style-type: none"> <li>• if recharging with a normal battery charger is not effective, you must use a double recharging cycle: <ul style="list-style-type: none"> <li>- charge slowly over a 10 hour period at a current of 1/10 the nominal capacity for 5 hours (e.g. for a 100Ah(5) battery the current must be set at 10A, using a manual battery charger);</li> <li>- rest for one hour;</li> <li>- charge with the normal battery charger.</li> </ul> </li> </ul>

<p><b>At the end of charging with the electronic battery charger, the battery does not provide the correct voltage (about 2.14 V per element without load) and appears to be uniformly not charged when tested with a hydrometer (<u>battery model only</u>)</b></p>	<ul style="list-style-type: none"> <li>the battery has not been connected to the battery charger (for example, because the low voltage connector of the battery charger has been erroneously connected to the machine connector)</li> </ul>	<ul style="list-style-type: none"> <li>connect the battery charger to the battery connector</li> </ul>
	<ul style="list-style-type: none"> <li>the battery charger and power socket to which the battery is connected are not compatible</li> </ul>	<ul style="list-style-type: none"> <li>check that the power supply characteristics indicated on the battery charger rating plate comply with those of the mains power supply</li> </ul>
	<ul style="list-style-type: none"> <li>the battery charger has not been installed correctly</li> </ul>	<ul style="list-style-type: none"> <li>taking the actual voltage available at the socket into account, make sure that the connections of the primary of the transformer inside the battery charger are correct (consult the battery charger manual)</li> </ul>
	<ul style="list-style-type: none"> <li>the battery charger is not working</li> </ul>	<ul style="list-style-type: none"> <li>make sure there is voltage to the battery charger, that the fuses are not blown and that the current reaches the battery; try charging with another rectifier. If the battery charger is not working, contact the technical service centre and indicate the serial number of the battery charger</li> </ul>

<p><b>At the end of charging with the electronic battery charger, the battery does not provide the correct voltage (about 2.14 V per element without load) and only one or a few elements are found to be discharged when tested with a hydrometer (<u>battery model only</u>)</b></p>	<ul style="list-style-type: none"> <li>one or more elements are damaged</li> </ul>	<ul style="list-style-type: none"> <li>replace the damaged elements if possible. For 6 or 12 V single block batteries, replace the entire battery</li> </ul>
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<p><b>The electrolyte in the battery is turbid (<u>battery models only</u>)</b></p>	<ul style="list-style-type: none"> <li>The battery has reached the end of the charging/discharging cycles declared by the manufacturer</li> </ul>	<ul style="list-style-type: none"> <li>replace the battery</li> </ul>
	<ul style="list-style-type: none"> <li>the battery has been recharged with too high a current</li> </ul>	<ul style="list-style-type: none"> <li>replace the battery</li> </ul>
	<ul style="list-style-type: none"> <li>the battery has been charged beyond the limit suggested by the Manufacturer</li> </ul>	<ul style="list-style-type: none"> <li>replace the battery</li> </ul>

## ALARMS ON THE DISPLAY

- 1) **ACC** "drive lever" already pressed when the machine is turned on or after an Emergency
- 2) **SIC** Emergency button pressed
- 3) **POT** Speed potentiometer fault
- 4) **MOS** Board (mosfet) short circuit
- 5) **HOT** Motor thermal cutout tripped
- 6) **LIM** Board (mosfet) thermal limitation problem
- 7) **BLT** Drive block. Appears when the battery voltage is too low and the drive is blocked.
- 8) **AcS** Brush Control Fault Appears when there is a fault in the solenoid switch controlling the brushes.
- 9) **AcA** Suction control fault. Appears when there is a fault in the solenoid switch controlling suction.
- 10) **FuP** Fuse. Appears when the fuse is blown.

### Board alarms CLEANTIME 90/MICRO SCRUB


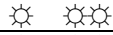
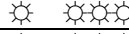
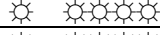
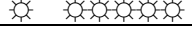

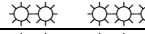
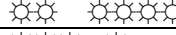
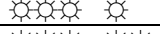
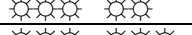
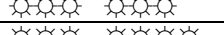
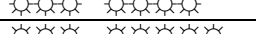
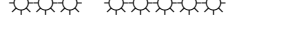


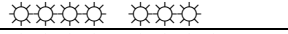
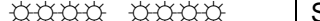
If drive is interrupted, the error code should be identified by means of the status LED (fig. 6. ref. 16). In the absence of malfunctions, the status LED is steadily on while the machine is in operation. If a malfunction is detected, the status LED provides two types of information, a slow flash (2 Hz) or a rapid flash (4 Hz) to indicate the severity of the malfunction.

Malfunctions with a slow flash are cancelled automatically once the malfunction has been repaired and the machine functions normally again. Malfunctions with a rapid flash ("\*" in the table) are considered more serious. The machine must be turned of using the key switch (fig. 6 ref. 14) to reset operation after repairing the malfunction.

The indication of severity remains active for 10 seconds, after which the status LED flashes constantly showing a two digit malfunction code until the repairs have been carried out.

For example, error code "1,4" is displayed as follows:


**example alarm code 1,4**

LED CODES		DESCRIPTION	
1,1		<u>Overheating &gt; 92°</u>	
1,2		Accelerator malfunction	
1,3		Speed limiter potentiometer malfunction	
1,4		Overvoltage malfunction	
1,5		Undervoltage malfunction	
2,1		<u>Principal contactor actuator opening failure</u>	
2,3		<u>Principal contactor actuator closing failure</u>	
2,4		<u>Principal contactor actuator closing failure</u>	
*	3,1		<u>Accelerator potentiometer malfunction</u>
	3,2		Brake activation malfunction
	3,3		<u>Low battery voltage</u>
	3,4		Brake deactivation malfunction
	3,5		<u>HPD malfunction (incorrect regulation of accelerator potentiometer)</u>
*	4,1		<u>Motor short circuit</u>
*	4,2		<u>Incorrect motor voltage/short circuit in motor</u>
*	4,3		EEPROM malfunction
*	4,4		<u>Short circuit in motor/EEPROM error</u>