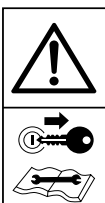




**MULTI BAY SELF SERVICE HIGH  
PRESSURE  
JET WASH CENTRE**

**LABRADOR**

**Use and maintenance instructions**



Before using the machine, read carefully these operating instructions.

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**Data shown in the identification plate of the machine**

Washing unit type:

Serial number:

Year of manufacture:

Washing unit delivery date:

**After Sale Service Centre authorized by  
«CECCATO SpA»**



**CECCATO S.p.A.**

Via Selva Maiolo, 5/7

36075 ALTE di MONTECCHIO

MAGGIORE (Vicenza) – Italia

Tel. +39 0444 708441

Fax +39 0444 695544

[www.ceccato-carwash.it](http://www.ceccato-carwash.it)

[info@ceccato-carwash.it](mailto:info@ceccato-carwash.it)

**After Sale Service**



Tel. +39 0444 708488

Fax +39 0444 708483

[service@ceccato-carwash.it](mailto:service@ceccato-carwash.it)

**Spare Parts**

Tel. +39 0444 708418

Tel. +39 0444 708489

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# SECTION 1

## Description and main features

### 1.1 PRESENTATION

This manual gives all information and instructions that are necessary for the correct use and the normal service of the self service high pressure system, “**Labrador**” also called machine or washing system in the text, manufactured by CECCATO SpA of Alte Ceccato, Montecchio Maggiore (Vicenza), Italy, also simply called Manufacturer in the text.

The scope of this manual is not to provide a complete description of the different parts or a detailed explanation of how they work, but the user will find everything he normally needs to know for the safe use and correct maintenance of the machine.

The instructions given in this manual must be followed and maintenance must be performed regularly and carefully to ensure problem-free running, long life and low cost operation of the machine.

Failure to follow the directions provided in this manual, operating negligence, improper use and unauthorised modifications can result in the Manufacturer cancelling the guarantee provided with the machine.



*The Manufacturer declines all liability for damages due to negligence and failure to follow the instructions given in this manual.*

For repairs or servicing involving complex operations, please call our authorised Afeter Sale Service Centres which will send qualified personnel or directly contact the Manufacturer who is at your full disposal for prompt dedicated technical support and any advice required to obtain maximum performance from the machine.



*This manual is an integral part of the equipment and must accompany it when this is moved or re-sold. It must be kept in a safe place known to the personnel in charge of the washing operation. It is the job of the*

*wash personnel to keep the manual in good condition so that it can be consulted whenever required throughout the life of the equipment.*

*If it is damaged or mislaid, a copy must be immediately requested from the Manufacturer.*

#### 1.1.1 WHOM IS THIS MANUAL FOR

This manual is a fundamental tool for all personnel working with the machine in different ways:

- Machine transport and handling personnel
- Machine assembly and disassembly personnel
- Personnel responsible for installation and the connections: electrical, etc.
- Washing personnel
- Maintenance personnel
- Machine final disposal personnel.



*Installation, connection and initial start-up of the equipment must be performed only by professionally qualified and purposely trained personnel.*

### 1.2 GUARANTEE

The Manufacturer guarantees its new products for 12 (twelve) months from the date of installation and for a period not exceeding eighteen months from the date of invoicing.

The Manufacturer also guarantees the metal structure of the washing equipment against through-corrosion for seven years.

When requesting work to be carried out under guarantee, the user can contact the Manufacturer directly or apply to the nearest authorised Service Centre.

The right to guarantee claim will be confirmed by presentation of the invoice and of the equipment start-up technical report duly filled by technical personnel authorised by the Manufacturer.

Upon receipt, check that the equipment is in perfect condition and complete.

Any complaints must be submitted in writing within 8 (eight) days from receipt of the machine.

The guarantee only covers repair or replacement free of charge of parts which, after careful examination by the Manufacturer's technical department, are found to be defective (excluding electrical parts).

Replacements or repairs of parts under guarantee do not extend the guarantee terms.

The purchaser has the right to guarantee interventions only if he has complied with the conditions and terms of the warranty which are also quoted in the supply contract.

### 1.2.1 EXCLUSIONS FROM THE GUARANTEE

**The guarantee does not cover** (in addition to the items specified in the supply contract):

- Failures or breakages caused by transport during ex works shipments.
- Failures or breakages deriving from inadequate power supply, water or compressed air supply or from failure by the user to perform the daily maintenance operations described in the operating and service manual.
- Failures or breakages deriving from unsuitable water quality (too hard, aggressive, presence of sand in suspension etc.).
- All consumables (brushes, wash chemicals and cleaners, softener salt, filters, lubricants, etc.);
- Damage to parts of the product delivery system deriving from the use of washing and water purifying chemicals other than those supplied and suggested by the Manufacturer.

**The guarantee will be void if:**

- The system has not been installed according to the conditions specified by the Manufacturer.
- The system has been modified, repaired or tampered with by persons not authorised by the Manufacturer or non-original spare parts have been used.
- The periodical maintenance operations **specified**

**in the operating and service manual have not been performed.**

- The payment conditions signed and accepted in the sale order have not been observed.

In addition:

- No compensation will be due for the period during which the system is not working efficiently.
- Repairs carried out under guarantee do not extend or renew the guarantee.
- Parts replaced under guarantee remain the property of the Manufacturer.



*Removal of the machine safety devices will automatically invalidate the guarantee and exempt the Manufacturer from all liability.*

*THE GUARANTEE IS ALSO VOID IF NON-ORIGINAL SPARE PARTS ARE USED.*

### 1.3 DESCRIPTION OF THE MACHINE AND USE

All “**Labrador**” washing units are equipped with the same technical components and are supplied in two main configurations:

**LABRADOR**; with a technical room built-in into the machine structure.

**LABRADOR WITH CABINET**; the technical equipment is placed in a cabinet mounted between the wash bays, with maximum 6 bays.

*The “Labrador” washing system is a machine marked CE in compliance with the standards established by the European Union indicated in directive EEC/89/392 and successive modifications, as described in the declaration of conformity with which every machine is supplied.*

*The unit can be divided into three parts, i.e. the structure, the technical equipment and the accessories of each wash bay.*

#### 1.3.1 STRUCTURES

There are two different types of structure and they differ mainly for the shape of the roof.

- The first one, called “curved roof”, is built with a self supporting frame of tubular steel elements, hot dip galvanized and painted in the parts in sight with polyurethane powders. The structure can be covered with a fascia of galvanized and painted steel sheet or a fascia of stainless steel, with the double function to integrate all the spray guns and coin box controls and to give the installation a more imposing look, which is very appealing for the wash customers. The wash bays separation walls are made with thick, insulated and flame-proof panels. The technical room, which is integrated in the structure, is accessible only through doors equipped with safety lock. The curved roof is made of translucent alveolar polycarbonate sheets and protects the bays from ultraviolet rays and atmospheric agents.
- The second one is called “flat roof” and is also built with a self supporting frame of hot dip galvanized tubular steel elements. The wash bays separation walls are made of aluminium with polycarbonate. The roof is built with self supporting Greek fret elements, with counter ceiling staves and perimetrical fascia.

#### 1.3.2 TECHNICAL ROOM

The main equipment for the operation of the system is installed in the technical room.

All technical equipment is designed in order to satisfy the demand of modularity.

Several groups are installed:

1. water treatment units (water softener and osmosis group),
2. high pressure units, with pumps and distribution collectors,
3. water heating group,
4. electric panel.

The stainless steel frames are standardized and can accommodate the equipment that is necessary to build up systems from two to six wash bays. The elements and the main characteristics of the system are following:

- Separation tank with pump and press-control to keep the water supply under regular pressure (option).
- Water softener group, complete with duplex valve and with two resin bottles in order to guarantee a continuous supply of softened water.
- Osmosis group fed in medium pressure by a multistage centrifugal pump (15-12 bar) with potentiality 100 from 200-400-600 litres/hour in function of the number of bays. The osmosis group includes a control system with pressure switch at the pump entry in order to divert, in case of malfunction, the soft water supply. System to recover the waste water for a better efficiency of the osmotic membranes (up to 50-60%). Reflux system to clean the osmotic membranes at the end of every production cycle.
- Osmosis water tank of plastic material, with submerged water delivery pump and press-control.
- Connection pipes manufactured with tubes in polypropylene, joined by melting the ends and connected with quick joints to facilitate maintenance on the machine.
- Standard solenoid valves, easy to find in the market and to replace.
- Dedicated dosing pumps (2 for each wash bay).
- Wash chemicals injection system fitted close to the aspiration side of each pump, with possibility to indifferently inject the chemical product in warm, osmotic or softened water.
- High pressure piston pumps (one for each bay) with motor of 2,2 kW - 6 poles mounted on anti

vibrating supports, equipped with by-pass and safety valves.

- Foam production system to be used with the relevant brush, with pipes independent from the high pressure line; it can be fitted as an option.
- Anti freezing system with dropping water, for external temperatures around zero degrees; it allows washing by low temperatures; can be delivered as an option.
- Floor heating of the wash bay, using the boiler system; can be supplied as an option. Electric panel equipped with PLC for the control of all functions of the washing system and the connected accessories, such as token suction, lighting system, etc. Possibility to connect the PLC to a programming unit with display and to modem for remote control and diagnostics.
- Control panel on each bay, including electronic coin box, wash time display, program buttons, bay on/off pilot lamps, emergency STOP button.
- Centralized suction of the tokens or coins in the technical room (option).

- Frost protection system on the lances and brushes (if installed).

### 1.3.4 EXTERNAL (OPEN) WASH BAY

- The external wash bay is equipped with longer pipes and higher lances support structures to allow cleaning of large dimension vehicles, such as vans, caravans, small busses and trucks, roulottes and similar vehicles. The washing procedure and the equipment are the same as those of the covered wash bays.

### 1.3.5 WASH BAY DIMENSION

The dimensions shown refer to standard structures.

	<i>covered</i>	<i>open</i>
<i>width</i>	m 5	m 5
<i>length</i>	m 6	m 7
<i>drive-through height</i>	m 2.7	3.7 m

### 1.3.3 EQUIPMENT OF EACH WASH BAY

Each washing bay has following equipment:

Bay control panel with:

**Activation system** fitted either with coins and tokens acceptor or with mechanical or electronic coin box, with or without electronic key.

- Display showing the available wash time and its progressive decreasing.
- Pushbuttons to select the wash program.
- Pilot lamps showing if the bay is working or not.
- Emergency STOP button.

BY PRESSING THE STOP BUTTON, THE WASH TIME (CREDIT) IS SET TO ZERO.

- Stainless steel rotating wash arm (360°) with pull damper, equipped with schock protected lance and spray gun with automatic return trigger.
- Connection pipes in special anti-abrasive material with swivel unions to facilitate the washing operations.
- Collection of the used tokens in the technical room. Though a dedicated vacuum system and pipes, the tokens are drawn into stainless steel boxes (option).

## 1.4 WASH BAY CONTROL PANEL

The wash bay control panel is equipped with:

- mechanical or electric operated coin box that can be programmed to accept token or coins,
- wash time display,
- program selection buttons,
- pilot lamps showing if the bay is operating or not,
- emergency STOP button.
- A payment system with electronic key can be fitted to the panel as an option (only with electric operated coin box).

## 1.5 WASHING PROGRAMS

Following standard washing programs are available:

- 1) Wheel rim wash (option): using the specific lance and special rim cleaner.
- 2) Washing: using the high pressure lance, softened hot water and shampoo.
- 3) Foam wash: using the brush and low pressure softened hot water with foam, shampoo and compressed air (optional program).
- 4) Rinsing with high pressure spray gun.
- 5) Waxing: using the spray gun with medium/high pressure water (with released gun trigger).
- 6) Final rinse with osmosis: using the spray gun at medium/high pressure and demineralized water obtained from the reverse osmosis system.

The washing steps can be selected by the wash customer when he is using the lances, also within the wash time allowed by a single token.

The wash time of each token/coin is electronically controlled by the machine program and can be modified, upon request, to suit specific needs.

## 1.6 LIGHTING SYSTEM

The lighting system is controlled by the main electric panel and includes:

- Two lamps in the technical room
- Four lamps in each covered wash bay
- Two lamps in each open bay.

The waterproof lamps are in compliance with the norms.

The lighting is controlled by a twilight switch which automatically lights up the lamp closest to the wash bay payment station.

When the wash customer inserts a token/coin into the payment station, all other lamps of the concerned wash bay will be switched on and will automatically switch off when the wash bay is not operated for a certain time.

## 1.7 OPTIONS

### 1.7.1 SEPARATION TANK

The separation tank provides a physical interruption between the water mains and the washing unit in order to assure a regular water supply.

It includes a tank equipped with a submerged pump delivering water to the washing unit. The pump is controlled by a pressure device on the supply line (press control) that switches off the pump if no water is needed:-

### 1.7.2 FOAM DEVICE WITH BRUSH

Further to the equipment installed in the technical room, this device consists of a swivel arm with a spray gun and bristle brush plus a container to house the brush, equipped with a self-cleaning device. Hot water is supplied at low pressure along with shampoo and compressed air.

### 1.7.3 MONEY CHANGER - TOKEN DISPENSER

The unit is used to change banknotes into tokens or coins and is equipped with specific safety devices against breaking open.

Customised tokens may be used upon request. It is possible to program different types of bonuses and promotions. Internal bookkeeping of total revenues, partial revenues and number of tokens sold.

### 1.7.4 TOKENS/COINS CENTRALISED SUCTION SYSTEM

This optional device allows to collect all tokens and coins that customers insert into the coin box of each wash bay. Through a underfloor tube, the chips are sucked and conveyed in a safe box made of stainless steel, placed inside the technical room.

### 1.7.5 FLOOR HEATING SYSTEM

- The floor heating system is recommended for particularly cold zones. It grants access to the wash bay, avoiding the risk of slipping because of floor freezing. It includes a pipe made of special material, sunk in the wash bay floor, through which warm water is circulated.

- The system uses the same boiler which is heating the wash water. When installing the floor heating system, the power of the boiler must be opportunely increased so as to prevent without any problem any ice formation on the floor of the wash bays.
- This system is very efficient, safe and cost effective in comparison to other systems, like the electric heating.

### 1.7.6 WHEEL RIM WASHING DEVICE

It includes one separate lance in each wash bay, to spray on the wheel rims a specific chemical cleaner.

## 1.8 AVAILABLE CONFIGURATIONS

The possible machine configuration includes a minimum of 2 bays up to a maximum of 6 bays (including the external bays).

Example of configurations (Fig. 1):

- 2 covered bays + 1 open bay
- 5 covered bays + 1 open bay

including all intermediate configurations.

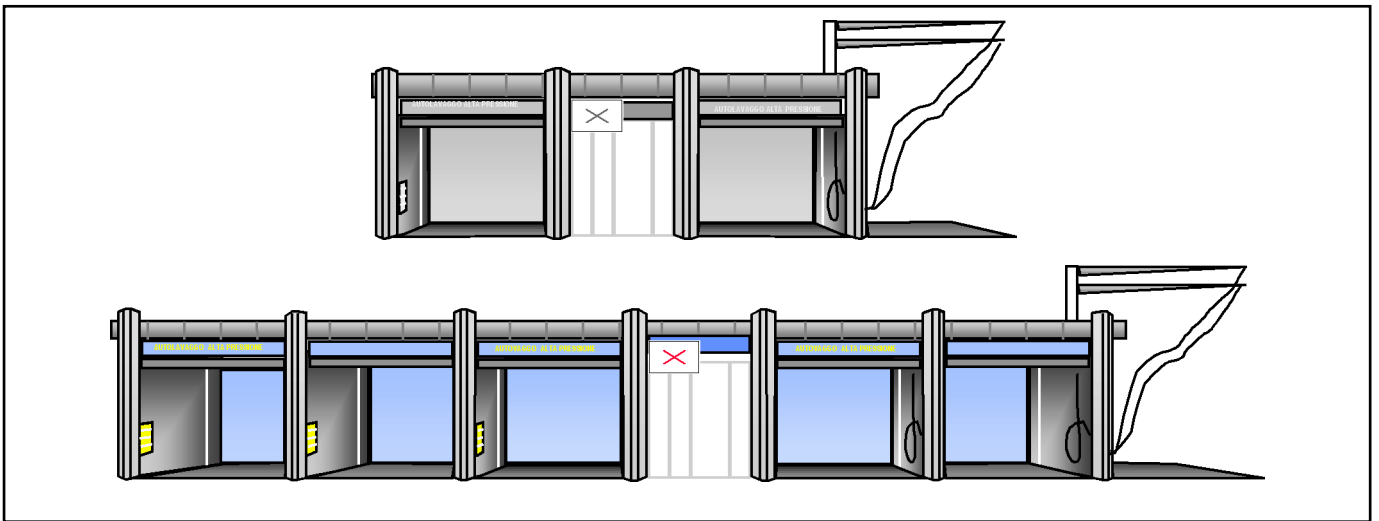


Fig. 1

## 1.9 NOISE LEVEL

Equivalent noise levels in dB(A), measured with high pressure lance in operation (Fig. 2).

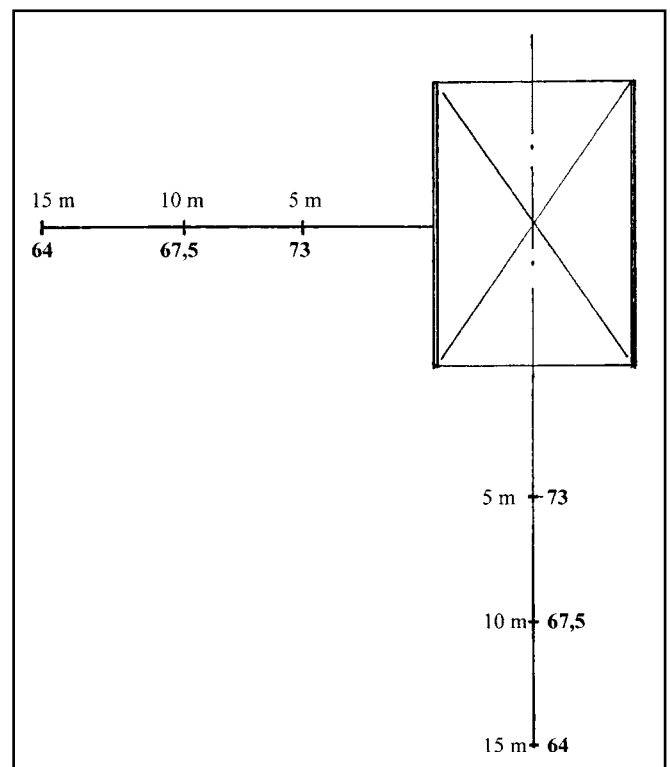


Fig. 2

## 1.10 USE

The system is designed to wash cars, commercial/ industrial vehicles, mopeds and bicycles on a self-service basis. It must therefore be exclusively used to wash the outside parts of the vehicles using a spray gun with high pressure water delivery plus a brush with low pressure water delivery if required. All other use of the machine differing from the descriptions in this manual shall relieve the manufacturer from all and every liability for deriving damages to persons, animals or property.

### 1.10.1 UNAUTHORISED USE





THE MACHINE HAS NOT BEEN DESIGNED TO BE OPERATED IN EXPLOSIVE ATMOSPHERE. ANY USE IN SIMILAR ENVIRONMENTS IS CATEGORICALLY FORBIDDEN.

## 1.11 IDENTIFICATION

Each equipment has an identification plate containing the following data:

- "CE" mark;
- Manufacturer's name and address;
- A) Washing type;
- B) Washing model;
- C) Year of manufacture;
- D) Series number;
- E) Max. power absorption (kW);
- F) Max. power absorption (A);
- G) Installed power (kW);

- H) Number of phases;
- I) equipment voltage;
- L) Frequency (Hz).
- The data contained in the identification plate of the equipment must be copied down in the second page of this manual and always mentioned when ordering spare parts and/or calling for assistance.
- The standard equipment is supplied with:
  - Instructions and washing maintenance manual;
  - Foundation drawing for the installation;
  - Overall dimension drawing;
  - Installation and connection drawing;
  - Electric wiring of the equipment;
  - Hydropneumatic diagram
  - «Ceccato» Chemical product sheets for self-washing;
  - «CE» declaration of conformity.

		CECCATO S.p.A. 36041 ALTE MONTECCHIO MAGG. (VICENZA) ITALY			
TIPO	<b>A</b>				
MOD.	ANNO				
<b>B</b>	<b>C</b>				
MATR.	<b>D</b>				
POTENZA MAX. ASS.	kW	<b>E</b>	<b>A</b>	<b>F</b>	
POTENZA INST.	kW	<b>G</b>		<b>L</b>	
FASI 3	<b>H</b>	V	<b>I</b>	Hz	<b>L</b>
					

## 1.12 CONNECTIONS

Water supply line to be provided:  
R1 2"

Inlet water connection: minimum R 1"

Wash water pressure: min. 4 - max 6 bar

Compressed air inlet connection: R 1/2"

Air pressure: 6 bar



*Any type of work on the electrical system, even when only of a slight entity, must be carried out by professionally qualified persons using adequate instruments and tools.*

Standard voltage and frequency:  
400 ± 10% V 50 Hz

Power supply cable:  
5 x 16 mmq (400 V)

### Maximum absorbed power

2 bay unit	13.4 kW
3 bay unit	18 kW
4 bay unit	20,6 kW
5 bay unit	24.2 kW
6 bay unit	27,8 kW

**Note:** *The maximum absorbed power is measured with all machine components in operation, i.e. bay lighting, token suction motors, compressor, separation tank pumps, high pressure pumps, osmotic water pump, softened water pump, water heater.*

### 1.12.1 INLET WATER QUALITY

The regular performance of the washing plant is granted only if the feeding water complies with the following characteristics:

PH		6-8	6-8
Hardness	(°F)	< 30	< 50
TDS salt content total	(mg/l)	< 3000	< 1500
Turbidity max	(NTU)	1	1
Free chlorine	(mg/l)	-	< 0.1
Iron		< 2	< 0.05

If the water characteristics are not as expected, CEC-CATO SpA is however at your disposal to define and supply the most suitable treatment system to obtain the required water quality.

## 1.13 OTHER FEATURES

### Washing section

Water consumption, each bay:

11 litres/minute

Max gun nozzle delivery:

11 litres/minute

Temperature of the water at the nozzle:

- approx. 12 °C with feeding from aqueduct/well.
- approx. 45 °C with feeding from the heating system

Pressure of the water at the nozzle:

approx. 10 MP a (100 bar)

### Water heating section

Heat generator thermal power:

from 25 to 92 kW depending on the type of boiler.

Granted hot water delivery:

from 833-2554 l/h depending on the type of boiler.

Maximum water exit temperature:  
55 °C.

Maximum water exit pressure:

0,6 MP a (6 bar).



# SECTION 2

## General safety norms

### 2.1 SAFETY

The Owner or the site Manager must inform the personnel about the risk of accident, about the safety devices for the operator and the user which are mounted on the machine and about the general accident-prevention regulations established by the directives and laws in force in the country where the system is used.

The safety of operators and users is one of the main concerns for machine manufacturers. Designers do build in as many safety features as possible when a new machine is designed. They try to foresee all potential danger situations and to install all the appropriate protections.

The number of accidents nevertheless remains very high due to careless and clumsy use of machines.

Carelessness, thoughtlessness and over-confidence are often the cause of accidents, in addition to fatigue and drowsiness.

This manual must therefore be read very carefully, especially the safety regulations, paying special attention to particularly dangerous operations.



*The Manufacturer declines all liability for failure to observe the safety and accident-prevention regulations given in this manual.*

*It also declines all liability for damages caused by improper use of the machine or unauthorised modifications.*



*Pay attention to this symbol when it appears in the manual.*

*It indicates a possible hazard.*

THERE ARE THREE TYPES OF HAZARD WARNING SIGNS:



*It is the maximum level of risk. This sign warns that if the operations described are not correctly performed, they will cause serious injury or death or involve long-term health risks.*



*This sign warns that if the operations described are not correctly performed, they can cause serious injury or death or involve long-term health risks.*



*This sign warns that if the operations described are not correctly performed, the machine can be damaged and/or persons may be injured.*



*Warnings and information concerning recycling are highlighted in the manual by the above symbol.*

#### 2.1.1 TERMINOLOGY USED

- To complete the description of the different hazard levels, definitions and specific situations which can directly involve the machine and/or persons in direct contact with the machine are given below.
- **USER:** the user is the person, organisation or company that has purchased or hired the machine and intends to use it for the purpose for which it has been designed.
- **DANGER AREA:** any area inside and/or near the machine in which the presence of an exposed person can represent a risk for the health and safety of that person.

- **EXPOSED PERSON:** any person who is entirely or partly in a danger area.
- **OPERATOR:** the person(s) responsible for operating, adjusting, performing routine maintenance and cleaning the machine.
- These actions must be carried out paying attention to the safety decals applied to the machine and must also be carried out by the manager of the system. Only adults are allowed to use the system.
- **USER:** The person who uses the system to wash vehicles must be helped to use the machine and be informed about the residue hazards and safety devices.
- **QUALIFIED PERSONNEL:** persons purposely trained and authorised by the Manufacturer to carry out maintenance or repair operations requiring special knowledge of the machine, its operation, the safety devices and how to carry out work on it; they are persons who are able to recognise the dangers deriving from use of the machine and are therefore able to avoid them. They can also be persons dealing with installation and handling of the machine.
- **AUTHORISED SERVICE CENTRE:** the authorised servicing centre is the organisation legally recognised by the Manufacturer which employs skilled personnel qualified to perform all technical support, maintenance and repair operations, including complex operations, necessary for maintaining the machine in efficient working order.

## 2.2 CLOTHING (OPERATOR)



- *Use suitable clothing. Avoid wearing loose-fitting flapping garments: they can get tangled in rotating parts. Long hair must be tied back.*
- *During maintenance and repair operations protective clothing, cut-resistant gloves and non-slip crushproof shoes must be worn.*

## 2.3 ECOLOGY AND POLLUTION



*Pollution of waste water is due both to the chemicals used for cleaning (detergents, waxes etc.) and the substances removed from the vehicles being cleaned (hydrocarbons, grease, oil, dust, soil etc.). The average pollution values found in car wash waste water after the pre-treatment phase, consisting of sedimentation and oil separation, are given below as a guide.*

<i>PH</i> .....	<i>5 - 10</i>
<i>Sedimented solids</i> .....	<i>ml/l 10</i>
<i>COD</i> .....	<i>mg/l 700</i>
<i>Mineral oils</i> .....	<i>mg/l 50</i>
<i>Tensides MBAS</i> .....	<i>mg/l 20</i>
<i>Fe</i> .....	<i>mg/l 2.6</i>
<i>Zn</i> .....	<i>mg/l 1.2</i>
<i>Suspended solids</i> .....	<i>mg/l 150</i>

The characteristics can vary considerably, according to the quality and quantity of wash chemicals used and how dirty the vehicles are.

To limit pollution, it is advised to use chemicals supplied by the Manufacturer of the car wash and to employ minimum amounts.

For the discharge of water from car washes, follow the current local waste water laws, in Italy law no. 319 dated 10.05.79.

The paragraph "Noise Level" gives the aerial noise levels recorded on the machine. The user/site manager is responsible for informing the machine personnel of the dangers deriving from noise and must observe the current national regulations. The noise emitted by the car wash can be considerably affected by the characteristics of the equipment fitted.



- *For use and disposal of the machine cleaning and maintenance products, observe the laws in force in the country where the machine is being used and the product manufacturer's recommendations.*

- *Dispose of any packaging remains in the appropriate garbage containers.*
- *When scrapping the machine, follow the anti-pollution laws in force in the country where the machine has been used.*

### 2.3.1 RECOMMENDATIONS TO REDUCE WASTE WATER POLLUTION

Waste water pollution can be significantly reduced by fitting stainless steel grilles instead of hot-dip galvanized steel ones.

**It is forbidden to wash the vehicle engines.**

## 2.4 SAFETY SIGNS (PICTOGRAMS)

The machine has been designed adopting all possible operator safety precautions. Despite this, however, some risks may remain, i.e. risks which cannot be completely eliminated under certain operating conditions.

These potential risks are indicated on the machine by means of adhesive signs (pictograms) which provide a summary indication of the various situations involving hazards and danger.



*Keep the adhesive signs clean and immediately replace them whenever they come off or are damaged.*

*Referring to Figure 3, the following text should be carefully read and memorized.*

- 1. Before beginning work**, carefully read the instruction manual for use of the machine.
- 2. Before performing** any maintenance operation stop the machine, disconnect the power supply and read the instruction manual.
- 3. Danger of burning.** Keep a safe distance from hot parts.
- 4. Danger of shearing.** Keep a safe distance from rotating fans.
- 5. Danger of slipping.** When getting into and out of the vehicle move with caution and be careful

of slippery areas.

- 6. Maximum permitted height of vehicles** . Do not introduce vehicles higher than the maximum permitted height.
- 7. High voltage.** Disconnect the power supply before carrying out any work on the machine.
- 8. Oiling points.** It indicates the position of the oiling points.

## 2.5 SAFETY DEVICES

- All moving parts that could involve additional dangers for the operator, i.e. the cooling fans of the electric motors, are protected by fixed guards which can only be demounted using tools.
- All electrical parts are enclosed within casings to protect them against direct contacts. Protection against indirect contacts is ensured by connecting the different machine components to the ground conductor. This latter should be connected to the general grounding circuit in the place where the system is installed. Protection against indirect contacts is also guaranteed by casings made of insulating material.
- The owner must install an automatic differential circuit breaker with  $I=0.03$  A activation current.
- All loads and electric circuits are protected by magnetothermic circuit-breakers. Once one of these has tripped, the relevant group will no longer be able to operate before the manual reset.
- One main isolator switch and one emergency stop button with mechanical lock are installed on the main electric board.
- An emergency stop button, without mechanical lock, is installed on the control panel of each wash bay. Pressing an emergency stop button will set the washing time to zero and stop the wash bay operation.
- An EMERGENCY STOP button must be installed in a box with glass cover, on the outside of the technical room. The glass must be broken to push the button and stop the complete installation.
- The fuel supply closing lever must be installed outside the technical room, in a well visible and marked position.
- The technical room and the boiler area are provided with ventilation openings that are necessary for the combustion and the release of possible gas escapes.

- The heat generator , CE marked, is equipped with following safety and control devices: supply water temperature thermomete, manometer, water temperature adjustment thermostat, safety thermostat with manual reset to stop the boiler operation if the output water temperature exceeds the maximum value of 90 °C.
- There are safety valves in the hydraulic circuits, on the outlets of the spray gun delivery pumps, which are activated if the operating pressure exceeds the setting value (approx. 12 Mpa - 120 bar).

### 2.5.1 RESIDUAL HAZARDS

The system has been designed and built with a view to eliminating all risks deriving from its use.

During normal use of the system, when this latter is filled with products or serviced, persons are, however, exposed to certain residue hazards which cannot be

totally eliminated owing to the actual nature of the operations,

The residue hazards are listed below along with instructions on how to reduce the frequency with which they occur as far as possible.

- **Use** - Read the operation and maintenance manual.
- **Risk of spurting water** at high pressure - Do not direct the spray gun towards persons.
- **Contact with chemical products** - Wear protective gloves.
- **Contact with chemical products** - Wear protective goggles.
- **Live parts** - Electric shock symbol.
- **Risk of tripping** - Take great care when working with the hose and spray gun.
- **Risk of soil and sand** being thrown up - Wear protective goggles during the washing phases.
- **Danger of burns** - Wear protective gloves when working near or in contact with electric motors, the heat generator or parts of the high pressure-hydraulic circuit.
- It is forbidden to work on **moving parts**
- **Danger of fire due to gas/diesel oil** - smoking and/or use free flames is forbidden.
- **Danger of slipping**. The wash bay floor may freeze in winter and be very dangerous. Hang out information and safety instructions panels!

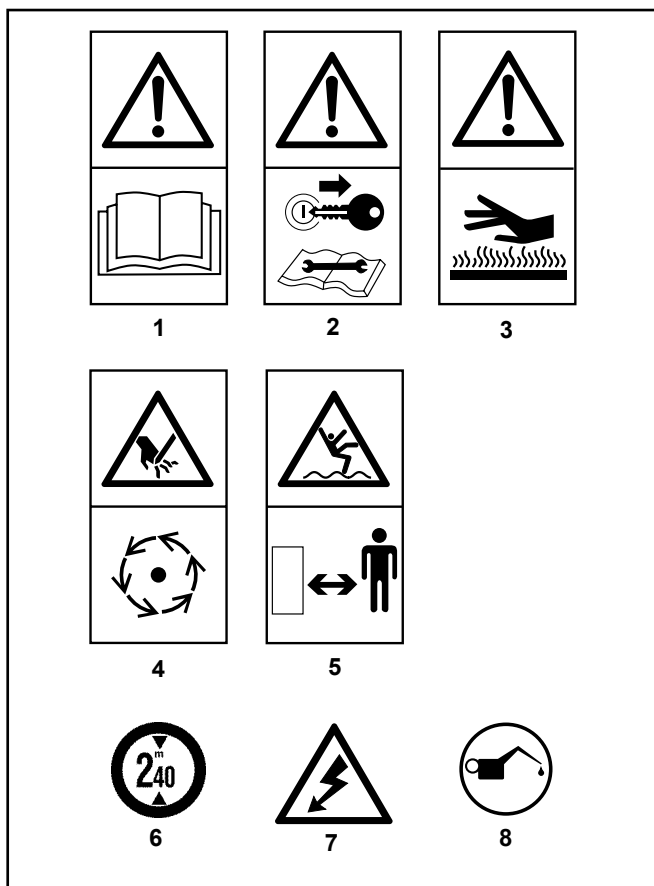


Fig. 3 - Danger signs

### 2.6 SAFE USE

 CAUTION

- Do not under any circumstances allow the system to be operated by persons who have not read and assimilated the contents of this manual or by personnel who are inexperienced or not in good health either psychologically or physically.

- Pay attention to the hazard warning symbols given in this manual and affixed to the machine.
- The hazard warning stickers must always be clearly visible; they must be kept clean and must be replaced if they become difficult to read.
- Before starting the machine, check that all the safety devices and the machine itself are in perfect working order.
- Before beginning work, become familiar with the control devices and their functions.
- During maintenance and repair operations protective clothing, cut-resistant gloves and non-slip crushproof shoes must be used.
- Do not under any circumstances touch the moving parts or stand between them.
- Before carrying out any work on the machine, disconnect the power supply and wait for all moving parts to come to a complete standstill.
- Before starting the machine, check that all safety devices are in perfect working order.
- Switch power off before leaving the machine unattended.

## 2.7 SAFE MAINTENANCE



ATTENTION

- Periodically check that the car wash as a whole and the protection devices are in perfect condition.
- Use the recommended oils.
- Spare parts must correspond to the Manufacturer's specifications. **Only use original spare parts.**
- Do not under any circumstances remove or tamper with the safety devices.
- Do not carry out maintenance and cleaning work before disconnecting the power supply.
- Perform maintenance in strict compliance with the instructions given in this manual; have damaged and/or worn parts replaced by qualified personnel.

### 2.7.1 FURTHER INSTRUCTIONS

Comply with the following additional instructions during use:

- during the wash the operator should wear goggles and all recommended individual protection devices in order to grant the highest possible operation safety.
- wear the prescribed protective equipment when servicing or repairing the system;
- also comply with the safety procedures indicated by the manager of the washing system during installation, use, maintenance, etc.;
- never vary the water pressure settings on the high pressure side, the safety valve settings or those of the ambient temperature thermostat for the anti-ice system;
- do not change the adjustment of the thermostat safety valve installed on the heat generator circuit.
- do not use liquids or mixtures in the water supply or as washing products, that could be toxic, harmful, inflammable, corrosive or that could jeopardize the safety of the machine or represent a safety hazard for the operator;
- the boiler in operation generates heat and must not be touched until it has cooled down.
- pay attention that the ventilation and gas escape openings of the technical room and boiler cabinet are not closed or clogged.

- the electric motors becomes hot as they operate; never touch the casings until they have cooled down. Take great care to prevent the ventilating slits from becoming clogged;
- avoid repeatedly placing the spray gun nozzle on the ground, as it could get damaged or clogged;
- do not direct jets of water against parts of the system, persons, animals or electrical equipment;
- wait for hot parts like motors and exhausts pipes to cool down before washing them.
- **disconnect the washing unit power supply by turning to “0” the main isolator switch before using electric welding machines to carry out repairs close to the wash bays. Otherwise the electric and electronic systems of the washing unit could be damaged.**
- follow all instructions and respect all interdictions.

# SECTION 3

## Transport

### 3.1 TRANSPORT

The system can be loaded on trucks or railway wagons if it needs to be transported to another place.

The system can be supplied disassembled, with the different parts packed into wooden crates.

The crates, provided with labels specifying weight and dimensions, can be easily moved with an ordinary forklift truck of adequate capacity (ref. 1 Fig. 4), or with a crane and cables (Fig. 4 rif. 2).



CAUTION

*Before proceeding with lifting operations, make sure that the car wash structures have been completely emptied and that all moving elements are secured.*



ATTENTION

- Unloading, lifting and handling of the car wash must be performed by specialised personnel.
- The user and his personnel must follow the instructions provided by the people in charge of transport.
- The user must make sure that his personnel is provided with suitable individual protection devices (gloves, safety shoes, helmet etc.) and with suitable equipment before proceeding with machine unloading, lifting and handling operations.

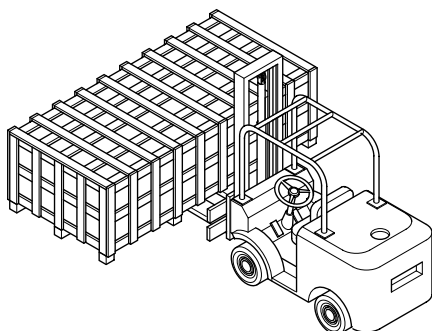
- Avoid several persons working simultaneously on the same machine without coordination as this can create hazards.
- Use an overhead travelling crane or crane of suitable capacity.
- Using an inadequate lifting equipment can cause personnel injury or accidents and damage to the machine.
- Check that the lifting cables comply with standards, that they are provided with the label containing all manufacturer information and that the capacity is clearly legible.
- Inspect the cables before using them: they must not be damaged, have broken strands or show signs of wear.
- Do not twist or knot the cables; follow the manufacturer's instructions.



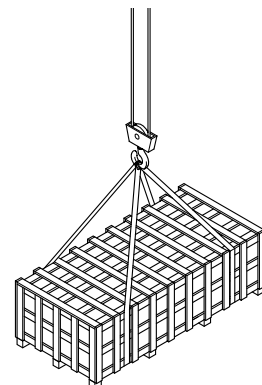
DANGER

*Lifting and transport operations can be very dangerous if not performed with all due care: keep out all outsiders, clear and mark the transfer area, check the condition and suitability of the equipment available, do not touch the suspended loads and keep a safe distance; during transport the loads must not be lifted more than 20 centimetres from the ground. You should also ascertain that the operating area is clear*

1



2



*and that there is sufficient space for quick escape if the load falls down.*

 CAUTION

The surface on which the machine is loaded must be perfectly flat to prevent the load moving.

Once the machine has been transferred to the lorry or railway goods van, ensure that it is safely secured in position.

Secure the machine with tight cables or chains to prevent all possible movement.

When the machine arrives at its destination, before removing the cables and chains check the condition and position of the machine to ensure that there are no potential hazards.

Remove the cables and chains and unload using the same equipment and procedures as used for loading.

 DANGER

AFTER UNLOADING THE CAR WASH WITH ACCESSORIES AND POSITIONING IT IN A SAFE PLACE, PROCEED WITH THE UNPACKING AND INSTALLATION OPERATIONS.

UNPACKING AND INSTALLATION MUST BE PERFORMED BY QUALIFIED PERSONNEL AUTHORIZED BY THE MANUFACTURER.

FOR THESE OPERATIONS, REFER TO «Section 7: INSTALLATION».

# SECTION 4

## Operating instructions

### 4.1 BEFORE USE

#### ATTENTION

*Before starting the equipment, the operator should have read and acknowledged all the parts of this manual and in particular «Section 2» regarding the safety.*

Before operating the equipment, ensure that the machine is in order, lubricating oils and supplies are topped up, and all parts subject to wear and deterioration are in perfect conditions of efficiency.

#### 4.1.1 CONTROL PANEL

Each wash bay is equipped with a control panel with the following devices:

- Pilot lights to signal when the system is operating or at a standstill.
- Emergency STOP button. Electronic coin acceptor for coins and/or tokens (it is possible to program the unit to accept different types of coins/tokens).
- Electronic key reader (option linked to the electronic coin acceptor). This system offers the possibility to wash using a prepaid electronic key.
- Display indicating the available time or the residual number of tokens. The indication progressively decreases as the programs are used.
- Pushbuttons to select the wash program.

When the system is operating, the user inserts coins and/or tokens into the coin box and the allocated available time will appear on the display. The time shown begins to decrease when one of the program buttons is pressed. The user can change the program and, thus, the washing phase at any moment. When the display has reached zero, other coins or tokens can be inserted to continue washing.

THE WASH TIME IS SET TO ZERO BY PRESSING THE EMERGENCY STOP BUTTON.

The standard programs are as follows:

1. **Washing:** is carried out at high/medium pressure using the spray gun. Hot water and shampoo are used. Start from the lower part of the vehicle to avoid drip marks. Wash only once, passing slowly and delicately over the same zone several times.
2. **Brush with Super Foam :** uses low pressure water and brush, with hot water + shampoo + air;
3. **Rinsing:** carried out at high pressure using the spray gun.
4. **Waxing:** at high/medium pressure, using the spray gun.
5. **Rinsing with osmosis:** is carried out at medium pressure using the spray gun. Only osmotic water is used.

If for some reason no osmotic water is available, the machine will automatically activate the rinsing program no. 3 also when selecting the program no. 5. This to allow completion of the wash cycle.

**When installed, the optional wheel rims cleaning program will be the number 1.**

#### ATTENTION

For the programming of the operator's panel, see the relevant user manual.

## 4.2 USE

The working area must be kept always clean and free from any obstacle. The working area must be kept always clean and free from any obstacle.

### 4.2.1 PRELIMINARY OPERATIONS

#### Daily:

- Clean the machine and the floor before operation start.
- Make sure that there are no foreign bodies on the brush and that the water spray from the gun is uniform.
- Clean the adhesive signs on the equipment so that they are clearly visible.
- Check the level of the chemical products in the relevant cans, if needed fill up. Consult the paragraph «Chemical products».
- Check the correct operation of the emergency push-button.
- Ensure that there is electric power and water supply.
- Discharge the condensate from the compressor.

### 4.2.2 WASH CHEMICALS



*The washing equipment has been designed and built to be used with detergents and car care chemical products recommended and supplied by the Manufacturer.*

*The use of other detergents or chemical substances may affect the equipment operation and safety.*

The quality of chemical products not only affects the result but also the lifetime of the pumping and injection system.

The use of low quality products may cause damages to the pumps and to the gaskets of product delivery and suction valves.

- Every morning when starting the equipment check the level of the chemical products.
- The system is equipped with dosing pumps, therefore the wash chemical must be used as it is supplied, without dilution.
- Replace a product that has not been completely used or topped up after a month as the product itself, and wax in particular, loses its characteristics when exposed to atmospheric agents.
- Every time an empty can is replaced with a full one, always clean the suction filters.
- Fill up before completely emptying the chemical cans. Dry operation may damage the pump membrane.

### 4.2.3 CHEMICALS DELIVERY ADJUSTMENT



*Delivery rate adjustment must be carried out always with the relevant pump in operation.*

To adjust the product delivery proceed as follows:

- 1 - With the pump in operation, adjust the delivery rate using the relevant adjustment knob;
- 2 - Proceed with small adjustments, checking the washing result.

### 4.2.4 FOAM ADJUSTMENT

Correct setting for a regular foam distribution is carried out at the company's premises, during testing.

You can modify setting by working on:

- 1 - Shampoo delivery
- 2 - Water delivery
- 3 - Air pressure

It is recommended to change one element at a time, considering that:

- a higher shampoo delivery means a richer foam;
- higher water delivery makes foam more liquid;
- higher air pressure increases the foam volume.

In addition:

- excessive air leads to a mixture of air and foam being delivered which results in light cracking noises;
- avoid excessive shampoo as it will make rinsing difficult and, as a consequence, imperfect drying and a mat finish on the vehicle.

#### 4.2.5 USE OF THE MACHINE

- 1) Position the vehicle in the center of the wash bay.
- 2) Obtain tokens and/or coins from the money changer.
- 3) Insert the tokens and/or coins into the coin box.
- 4) Pick up the spray gun.
- 5) Press the Washing button.
- 6) A throttled jet of water will spray from the gun. Press the gun trigger to obtain a full jet.
- 7) Proceed with the other operations in sequence.
- 8) Consult the manager if you have problems.

**Note:** *when switching from one wash phase to the next, you must wait a few seconds before the chemical product in the program you require is delivered.*

*Above instruction are also affixed near the control panels of the system.*

**Furthermore:**

- make sure that there are no bystanders and/or animals in the vicinity of the system as they could be accidentally hit by the jet of water and/or by other objects such as stones, soil, sand, etc., thrown up by the jet of water itself;
- the system will cease to operate once the time allowed by the tokens/coins used has elapsed. You must insert extra tokens or coins if you have not finished washing the vehicle;
- once the vehicle has been washed, put the spray gun back into its holder in the relevant wash bay;
- the customers must press immediately the emergency STOP pushbutton installed on the control panel of the relevant wash bay by break-down or malfunction of the unit or in a situation of danger. He should then immediately inform the personnel of the site or leave a message if the station is unattended.

- Depending on the type of fault, disconnect the wash bay or the entire system from the power supply and the water mains. Do not attempt to repair or tamper with the system. Contact qualified personnel.
- Repairs may only be carried out by the manufacturer's personnel or by an authorized after-sales service center using genuine spare parts.

WHEN PRESSING THE EMERGENCY STOP BUTTON, THE WASH TIME WILL BE SET TO ZERO.

Depending on the type of fault, disconnect the relevant wash bay or the complete installation from the electric, water and air supplies. Do not try to repair the fault yourself, call qualified personnel.

Repairs must be carried out by the manufacturer's after sale service, using original spare parts.

#### 4.2.6 WASH TIME ALLOWED BY TOKEN OR COIN

A basic wash time unit (example 60 seconds) is provided by each token or coin. This time can then be decreased with different speed, depending on the wash phase. This setting will be done by modifying the parameters through the programming device connected to the PLC of the installation (see relevant manual section).

#### 4.2.7 DISPLAY OF AVAILABLE WASH TIME UNITS

The display shows the total available wash time depending on the number of tokens or coins inserted (example: if 3 tokens are introduced, the display will show  $3 \times 60 = "180"$ ).

The time will start to decrease when a washing program button is pressed.

#### 4.2.8 CHANGE OF WASH PROGRAM WHEN THE BAY IS IN OPERATION

The programs can be changed by the customer at any moment by pressing the relevant program button. The system will stop when the available time has elapsed.

#### 4.2.9 OPERATION OF THE TOKEN SUCTION SYSTEM

When introducing a token/coin into the coin box, the suction system will automatically start and remain on for a time depending on the distance of the bay from the collection safe.

#### 4.2.10 LIGHTING

One lamp close to the control panel is automatically switched on by a dim light switch. Complete wash bay lighting will be switched on by token/coin insertion and will remain on for a pre-set time after the wash time has elapsed.

### 4.3 EMERGENCY STOP



*Press one of the emergency buttons installed in the machine if the washing system must be stopped immediately for any reason.*

#### 4.3.1 STOP OF INDIVIDUAL WASH BAY

The control panel of each wash bay is equipped with a STOP button. By pressing the button, the wash program is stopped and the wash time is set to zero. Insert a new token/coin to start again the wash bay.

#### 4.3.2 TOTAL EMERGENCY STOP

The whole system can be completely stopped by an emergency.

This is done by pressing the mushroom-shaped emergency button installed on the main electric panel that can be released by manual rotation, or by using the remote emergency button with key-operated release. The remote button is normally installed closed to the technical room, enclosed in a box with glass cover, and can be activated only after breaking the glass.

#### 4.3.3 RESET OF THE INSTALLATION AFTER A TOTAL EMERGENCY STOP

Washing operation can be started again after an emergency stop only if the problem that caused the emergency stop has been solved;

- Release the mechanical block of the emergency stop push-button, by rotating the same push-button.

### 4.4 RESET OF OVERLOAD RELAY IN THE ELECTRICAL CABINET

Automatic and circuit breaker switches are installed in the general electric panel of the equipment.



*Before opening the electric cabinet, power off the circuit breaker-differential switch positioned upstream from the electric line supplying the washing equipment (the electric system provided at the user's expenses, must be compulsory fitted with such a device in compliance with the European electric safety regulations).*

*Make sure that nobody can operate the circuit breaker-differential switch during the intervention in the electric cabinet.*

### 4.5 FROST PROTECTION SYSTEM

The antifreezing system is automatically activated by the thermal probe measuring the external temperature.

This probe starts the frost protection system of the external water pipes immediately when the temperature drops below the selected temperature.

To avoid building-up of ice the external canalizations, an electrovalve is opened and allows a continuous small water flow through the pipes.

The regulation of the thermostat is generally set in order to activate the system by a temperature of approx. 2°C.

If a regulation on site is necessary to meet the local conditions, call the after sale service.

An electric heater, installed inside the technical box, automatically activated, has the function to protect from freezing the components fitted in the cabinet. The thermostat adjustment allows to regulate the temperature in the technical box.

#### Note

*The frost protection system operates only when the washing unit is powered and allows to wash vehicles with temperatures close to 0°C, (minimum temperature -2°C).*

### 4.5.1 FROST PROTECTION

At the beginning of the cold season the vent holes of the technical cabinet must be covered with the specific closures.

With temperatures until  $-10^{\circ}\text{C}$  and with the unit powered, the equipment inside the technical cabinet is protected from freezing by an electric heater (with these low temperatures washing is not possible because the water freezes on the vehicle and on the floor causing damages and situations of danger).

With temperatures lower than  $-10^{\circ}\text{C}$  that, considering the thermal excursion during the night, may drop below  $-20^{\circ}\text{C}$ , it is necessary to adopt the necessary measures in order to protect the components of the equipment from the ice. The site manager (or the person in charge of the site maintenance) must take care of the following:

- completely discharge the water from the hydraulic circuit;
- dismantle the spray guns, the cartridge filters, the water softener, and the osmotic membrane from the machine and store them in a place where the temperature will not drop below  $0^{\circ}\text{C}$ . Also the LCD display will freeze with temperatures below  $-25^{\circ}\text{C}$  and must therefore be disassembled and protected.

*Note: also the washing unit water supply line must be adequately protected from freezing, by covering it with suitable insulating materials or by emptying it.*

### 4.6 CONTROLS IN THE ELECTRIC CABINET

The unit main electric panel is fitted into a cabinet; following control are available:

Starting from the top, left side (Fig. 5):

- Interface between operator and machine, for machine setting and diagnostics. See next paragraph (EPADO5).
- Two thermostats: the first one measures the outside temperature and starts the frost protection system, the second one controls the temperature of the bay pavement and starts the floor heating. Press the set button to adjust the thermostat: a red lamp will start flashing and the activation temperature can be increased or lowered with the pushbuttons. When the red lamp switches off, the new setting is memorised and the display will show again the actual temperature measured by the external probe.

- Bay ON/OFF selector switches.
- All bays lighting system manual control (dim light switch excluded).
- Manual activation of osmotic water production, without intervention of the float switch in the tank. Osmotic water production OFF selector switch.
- Main switch.



- Floor heating switch.
- Emergency stop button on the cabinet side.
- Selector switch to start the dosing pumps, for priming or adjusting.



# SECTION 5

## Maintenance

### 5.1 MAINTENANCE

The different operations of ordinary maintenance are described below.

It is worth reminding that low operation costs and the lifetime of the equipment depends on the compliance with following maintenance schedule.

The intervention times described in this manual should be considered as a reference in normal conditions of use, and may change according to the different operations, seasons, etc.

With heavier conditions of use, maintenance should be carried out more frequently.



CAUTION

*While topping up or replacing oil, use the same kind of recommended oil.*



DANGER

*Keep lubricants far from children's reach.*

*Read carefully the warnings and precautions indicated in the lubricant containers.*

*Wash hands thoroughly after use.*

*Disposal of used oils must be carried out in compliance with anti-pollution regulations.*



ATTENTION

*Before carrying out maintenance turn off all power, air and water supply and drain the hydraulic and pneumatic circuit by means of the appropriate taps provided*

The maintenance operation to be carried out periodically has been divided into two different groups:

**Routine maintenance**, which covers lubrication and simple cleaning and service operations that can be carried out by the user/site manager with a little knowledge of the washing system.

**Extraordinary maintenance**, referred to more complex operations which require the presence of personnel trained by the Manufacturer Technical Service.

This section describes the servicing work to be carried out when the system is used for the first time, and the routine maintenance operations.

#### 5.1.1 INITIAL PERIOD OF USE

Check the level of the oil in the high pressure pumps for the first time after 50 hours of operation and change the oil after 200 hours of operation.

#### 5.1.2 DAILY OPERATIONS

Clean the wash bay walls and floor before starting the equipment in the morning. Industrial or domestic cleaning products can be used, mainly when it comes to acid ones. Do not use solvent based products as they would spoil the paintwork and dull the plastic parts. Cleaning with high pressure water jets should be limited to the lower part of the equipment to avoid penetration of water through the control panels and cabinet openings and doors.



**Note:** *It is forbidden to clean the coin box zone with high pressure water as the coin boxes could be damaged. The electronic equipment inside is very delicate and must not be wetted. Make sure that no water can infiltrate through the coin insertion slits.*

- Clean any fuel stains from the floors.
- Empty the waste containers and aspirators.
- Clean the warning and instruction signs so that they are clearly legible.
- Check the level of the chemical products in the relevant cans. Top up if necessary. Consult the "chemical products" section.

- Check the level of the salt in the brine tank of the softener.
- Make sure that the electric energy, water and air supplies are functional.
- Drain the condensation water from the compressor, if installed.
- Empty the coin boxes.

Note: if the installation is equipped with tokens/coins suction device, check regularly the correct operation of the system.

### 5.1.3 CONDITION OF THE LANCES AND PIPES

Check the condition of the pipes, of the lances unions and of the nozzles at the lance's tip.

The lance is equipped with a protective guard that may be damaged by strokes or clogged by foreign bodies; in such cases the guard should be cleaned or replaced.

### 5.1.4 WEEKLY OPERATIONS

#### Nozzles

Clean the nozzles and their guards.

#### Softener

Check the level of the salt in the container. It must reach between one quarter and full.

Check the inlet pressure of the water in the circuit.

Check the hardness of the water produced by the softener using the relative Kit. Ugelli

#### Compressor

Check the regular operation of the air compressor. Verify and clean if necessary the air filter. Check the oil level through the spy hole in the motor base-ment. Drain the air vessel opening the screw at the bottom.

#### Osmosis group

Make sure that demineralized water is produced in an efficient way.

When it drops below the characteristic parameters, call the technical after sale service and have the membrane checked and changed if necessary.

### High pressure pumps

Check the oil level and top up if necessary.

Check the pressure with a gauge.

When the track is operating, the pressure values should read as follows:

- with the control on the handgrip released: 90/100 bar.
- with gun lever pressed: 85/90 bar.

### Shampoo and wax levels

Check the wash chemical cans and top up if needed.

### Filters

Check both the water inlet filter and the two filters in the osmotic water production circuit.

### Burner

Follow the relevant instructions of the burner user manual.

Check the diesel oil level (oil burner) or the gas tank reserve (gas burner), and the water temperature.

### 5.1.5 MONTHLY TEMPERATURE

#### High pressure pump

Check the oil level through the spy hole and top up if necessary.

If the unit is equipped with CAT pumps, lubricate the felts (two oil drops in each opening).

#### Lance

Check the condition of the nozzle. An irregular water jet shape may indicate insufficient pressure or a clogged nozzle. Check all the unions and the position of the protective sheath.

#### Valves and wash chemicals suction filter

Check the valves and suction filter in the shampoo and wax polish dosing pumps. Clean if necessary, by simply rinsing and then brush.

#### Pits

Regularly clean the decantation pit area.

 **WARNING!**

*Draining and cleaning must be carried out by a specialized company as required and in compliance with the laws in force.*

### 5.1.6 EVERY SIX MONTHS

#### Technical equipment

- Make sure that all unions are well clamped.
- Make sure that the pressure switches operate efficiently.
- Make sure that the cable clamps on the electric motors are well tightened.
- Check that the screws of the terminals inside the electrical cabinet are tightened.
- Make sure that the softener is efficient by measuring the hardness of the water it produces.
- Check the quantity and quality of the demineralized water produced.

#### Structure

- Clean the complete installation: roof, gutters, frame elements, ecc.

#### Burner group

- General check of the burner, following the instructions of the relevant user manual.

 **WARNING!**

*It is compulsory to have the burner cleaned and checked by an authorised after sale specialist.*

#### Compressor

- Drain the vessel.
- Top up the oil as indicated in the user manual.

## 5.2 LUBRICATION

It is highly important to lubricate any machine with turning and/or rubbing parts, to increase lifetime and ensure correct operation. The lubrication operations should therefore be carried out systematically and at established frequencies.

#### Lubricants

- For the CAT high pressure pumps, use oil ESSO NUTO H68 (ISO VG 68) . Recommended oil change: every 250 operation hours.
- Use grease for universal use for the bearings and bushings.
- For the compressed air filter - reducer - lubricator unit use oil with a viscosity of between 9 and 11 mm<sup>2</sup>/s (cst) or 40°C type:
  - BP Energol HPL 10;
  - ESSO Spinesso 10;
  - SHELL Tellus C10;
  - MOBIL DTE 21.

### 5.3 IDLE PERIODS

If the washing unit is not going to be used over a long period of time:

1. Fill the chemical product reservoirs with water only and allow the system to make a few complete washing cycles. Now proceed with a few washing simulations with the chemical product reservoirs completely empty. These operations will clean and then empty the chemical dispensing and delivery system.
2. Empty all the water pipes in the system by opening the relevant drain cocks.
3. Disconnect the electric line that connects the washing system to the power mains by means of the isolator switch installed on the supply side of the line itself. Disconnect the water and compressed air connections. Make sure that the line switch is not turned on again by unauthorized persons during the period in which the system is not used.
4. Generally grease the system using water-repellent grease.
5. Store the spray guns and brushes in a protected position, sheltered from direct sunlight.

 **WARNING!**

Contact the Technical After Sale Service of CECCATO SpA to start again the installation.

### 5.4 DISMANTLING THE UNIT

Whenever you decide to dismantle the equipment, it must be disassembled and divided into similar units which will be disposed of in accordance with current local regulations concerning special waste disposal. Lubricants and detergents of any kind must be disposed of in accordance to their own structure.

### 5.5 FAULT FINDING

 **ATTENTION**

- Power off the equipment before carrying out any repair or maintenance operation.
- Ensure that the door locking main switch is not actuated by unqualified or untrained personnel.
- If the fault persists even after the instructions listed hereafter have been followed, contact the Manufacturer Technical Service.

 **ATTENTION**

*The repairs and maintenance operations with the symbol at the side must be carried out by after sale engineers of CECCATO SpA.*

<b>The machine does not work</b>	
<input type="checkbox"/> No power supply.	<ul style="list-style-type: none"> <li>- Check that the pilot lamp on the external electric cabinet is on.</li> <li>- Check the power supply line with a voltmeter.</li> <li>- Check if overload protections (fuses and relays) have tripped.</li> <li>- Check the messages on the display of the main control panel.</li> </ul>
<b>Water jet pressure is not regular</b>	
<input type="checkbox"/> Water pressure too low.	Check the delivery and pressure of the water line.
<input type="checkbox"/> Clogged filter.	Check the water filter.
<input type="checkbox"/> Clogged nozzle or pipe.	Check that the nozzle is not clogged or damaged.
<input type="checkbox"/> Malfunction of the HP pump.	Check the pump operation and read the water pressure.
<b>Water jet shape is not regular</b>	
<input type="checkbox"/> Nozzle clogged.	Check that the nozzle is not clogged or damaged.
<b>No high pressure water</b>	
<input type="checkbox"/> Pumps blocked	Check the regular operation of the pumps.
<input type="checkbox"/> Solenoid valves out of order	Check that the water inlet valves are not blocked.
<input type="checkbox"/> Valves shut	Check that the valves are open
<b>No wash chemicals delivery</b>	
<input type="checkbox"/> Chemical cans empty	<ul style="list-style-type: none"> <li>- Check the chemicals level.</li> </ul>
<input type="checkbox"/> Dosing pumps blocked.	<ul style="list-style-type: none"> <li>- Check the dosing pumps operation; clean the filters.</li> <li>- Check the compressed air supply.</li> </ul>
<b>No hot water supply</b>	
<input type="checkbox"/> Burner not working	Check that the heat exchanger is working.
	Check the oil or gas level in the relevant tanks (if not connected to gas network).
<b>Dry spots: water treatment</b>	
<input type="checkbox"/> Dry spots are due to mineral contents in the water that are not eliminated by the osmosis group	If the unit is equipped with osmosis group, check the TH of the softened water. It should be 0°. If not, stop immediately the osmosis group. Verify that regular maintenance has been carried out. If the TH is 0°, start the osmosis group and check the delivery.
<b>The pump works normally and the pressure does not reach 80-85 bar</b>	
<input type="checkbox"/> Nozzles worn out.	Change the nozzles.
<input type="checkbox"/> The pumps gaskets are broken	Disassemble the pump head and replace the gaskets.
<input type="checkbox"/> Some dirt may prevent closing of the valve.	Disassemble the pump head and clean.
<b>The pump works but it is noisy (cavitation)</b>	
<input type="checkbox"/> No water supply	Stop immediately the pump and check that all valves are open.
<input type="checkbox"/> Too low pressure in water line.	Check the water inlet pressure.
<b>The lightening system does not work</b>	
<input type="checkbox"/> No power supply.	Check the relevant fuse and the main switch.
<input type="checkbox"/> Dim light switch dirty or faulty.	Clean the dim light switch.
	Check that the probe is well fitted, if necessary replace it.
<b>Coins/tokens are not accepted</b>	
<input type="checkbox"/> Unit in emergency stop.	Check the cause of emergency stop and reset.
<input type="checkbox"/> Gettoniera fuori uso.	<ul style="list-style-type: none"> <li>- Sostituire la gettoniera</li> <li>- Ritarare gettoni e/o monete.</li> </ul>

### 5.5.1 PROBLEMS ON THE WATER SOFTENER GROUP

<b>The unit does not regenerate the water</b>	
<input type="checkbox"/> No power supply	Check fuses and main switch
<input type="checkbox"/> Timer faulty	Change the timer
<b>Hard water comes out of the unit</b>	
<input type="checkbox"/> No salt in the container	Add salt
<input type="checkbox"/> Clogged injector filter	Clean the filter
<input type="checkbox"/> Salt container filling flow is not enough.	Check the time to fill the salt container and clean the one-way valve
<input type="checkbox"/> Air leakage or faulty water suction in the salt container.	- Check the gasket and the pilot tube. - Check the submerged tube
<input type="checkbox"/> Internal loss in the valve.	- Replace the valve gasket, the cross elements or the piston.
<b>Too high salt consumption</b>	
<input type="checkbox"/> Regeneration volume adjustment too high	Check the regeneration volume according to the water hardness.
<input type="checkbox"/> Too much water in the salt container	Injector clogged - Foreign body in the brine valve, disassemble and clean
<b>Pressure drop</b>	
<input type="checkbox"/> Iron deposit in the pipes.	Clean the pipes.
<input type="checkbox"/> Iron deposit in the softener.	Clean the valve and the resin bottles. Increase the regeneration frequency.
<input type="checkbox"/> Softener inlet side clogged by residues of works in the pipes	Clean the valve.
<b>Loss of resins at the exit to the sewage</b>	
<input type="checkbox"/> Air in the water system.	Check that the tank is not dry.
<b>Iron in the treated water</b>	
<input type="checkbox"/> Resin exhausted.	Check the first phase; the brine suction and the salt container filling. Increase the regeneration frequency.
<b>Too much water in the salt container</b>	
<input type="checkbox"/> Brine suction valve clogged.	Check the delivery regulator
<input type="checkbox"/> Injector clogged.	Clean the injector and the filter
<input type="checkbox"/> Timer does not control the cycles.	Change the timer
<input type="checkbox"/> Foreign body in the brine valve.	Replace the brine valve seat and clean the valve.
<input type="checkbox"/> Foreign body in the one way valve.	Clean the valve.
<input type="checkbox"/> Power black out during filling of the salt container.	Check the power supply.
<b>The unit does not draw-in the brine</b>	
<input type="checkbox"/> Brine suction valve clogged.	Clean the delivery regulator.
<input type="checkbox"/> Injector clogged.	Clean the injector.
<input type="checkbox"/> Injector filter clogged.	Clean the filter.
<input type="checkbox"/> Too low pressure in the system.	Increase the pressure in the system to 1,7 bar.
<input type="checkbox"/> Valve internal leakage.	Replace the gaskets, the cross elements and the piston assembly.
<input type="checkbox"/> Air leakage or water suction anomaly in the salt container.	- Check if the delivery pipe is broken. - Check the gasket and the pilot tube. - Check the submerged pipe.
<b>The valve regenerates without interruption</b>	
Switch broken or in short circuit.	Check whether the fault is in the switch or in the timer and replace the relevant item, or replace the complete control head.
<b>Loss towards the sewer</b>	
<input type="checkbox"/> The valve does not carry out the program.	Check the timer program and the valve positions. If the positions are not the correct ones, replace the complete control head.
<input type="checkbox"/> Foreign body in the valve.	Dismount the complete control head and check the valve inside in the different positions of regeneration.
<input type="checkbox"/> Valve internal leakage.	Replace the gaskets and the piston assembly.

## 5.5.2 PROBLEMS WITH THE OSMOSIS GROUP

<b>Faulty pressure</b>	
<input type="checkbox"/> Pre filtre clogged.	Replace it
<b>Too low water delivery</b>	
<input type="checkbox"/> Module clogged.	Clean the module.
<b>Water delivered of bad quality</b>	
<input type="checkbox"/> Inlet water quality was changed	Check the quality of the water entering the osmosis grup and repeat the start up procedure
<input type="checkbox"/> Faulty module.	Check and rplace if necessary.



# SECTION 6

## Spare parts

### 6.1 PURCHASE ORDER PROCEDURE

All equipment parts can be ordered to the Manufacturer by sending a detailed request including:

- Equipment model.
- Equipment serial number.
- Part code No. (see spare part catalogue).

Means of transport.

If you fail to instruct the Manufacturer about the means of transport required, this service will be provided and given the greatest care. However the Manufacturer will not be liable for any delays in transport due to causes of Force Majeure. Transport expenses are always at the consignee's cost. The goods, also when delivered C&F, are transported at the buyer's own risk.

*The Manufacturer is always available for any request of service and/or spare parts. spedizione dovuta a cause di forza maggiore.*



# SECTION 7

## Installation

### 7.1 UNPACKING



*Cutting of packing steel bands is a dangerous operation as strips of the bands may hit the face or hands of the person cutting them.*

*Do not leave cut strips around. I*



*All packing materials are environmental-friendly. They can be stored with no danger or burned in suitable waste incineration plants.*

*Plastic materials can be recycled.*

***Paper and cardboard should be disposed of at paper recycling collection points.***

### 7.2 INSTALLATION

**By choosing where the equipment should be positioned, consider the following points:**

- The base must be perfectly levelled with a loading capacity suitable for bearing the weight of the entire structure. The yard must be arranged in compliance with the foundation drawings provided by the Manufacturer;
- The equipment should be entirely surrounded by a large obstacle-free operating area;
- There should be the possibility to surround the installation with a fence, to prevent free access for children or non authorized persons.
- The lighting system must be efficient and in compliance with the norms.
- The washing unit should be installed close to the main earth leakage circuit breaker.
- The supply system must be grounded in compliance with current regulations;
- The working environment must not be in explosion atmosphere.

In addition to the CEI technical specifications, electric systems in particular must comply with the rules provided for by Decree-Law 626/94 and Law 46 - 5.3.90 as well as the rules for the execution of the Presidential Decree 47 - 6.12.91. It is mandatory that the technician who carries out the electric connections satisfy special technical-professional requirements and be enrolled in the relevant professional register.

The technician is also obliged to issue a "declaration of conformity" for the buyer.



*The 230 Volt universal socket on the electrical panel is powered when the door locking cut-off switch is turned off.*



***IT IS ABSOLUTELY FORBIDDEN to tamper with or disconnect the equipment unipotential protection circuit.***

### 7.3 FIRST START UP

During the testing which every washing equipment must undergo at the factory, all the main settings are carried out.

However, at the first start up it is advisable to ensure that:

- The auxiliary circuit transformer and the motors are connected according to the rating of the mains supply voltage;
- The motor protections have been set to the absorption values recorded with the local mains voltage;
- The motors rotate in the correct direction. If the direction of rotation has to be reversed, you should work on the electric panel terminal board rather than on the motor connections.

Check then the wash chemical cans and fill up if required.

### 7.3.1 CHECKING THE CORRECT OPERATION OF THE WASHING UNIT

When the system is started for the first time, it is important to check and make sure that all the functions take place in the right way.

Indications are therefore given below to ensure that the system operates correctly.

#### Operating principle

The water supplied by the aqueduct can be conveyed directly into the washing unit hydraulic circuit if the pressure (4 bar) and delivery flow are constant. A better alternative is to install a water separation/accumulation tank (option).

From the separation tank, the water is supplied to the washing units with an electropump, controlled by the Controlpump device.

When the water pressure in the circuit is too low, the pressure switch (adjusted at 0,5 bar) will be activated, stopping the washing unit. The alarm message will be shown on the display.

The osmosis feed pump and the solenoid valve are controlled by the float switch in the osmosis tank and are activated if the water level is low.

When the osmotic water tank is full, a solenoid valve is activated for a few seconds to wash the membranes, then the pump stops.

The osmotic water delivery pump is controlled by the PLC of the washing unit.

When no osmotic water is available, the pressure switch will automatically activate the change from osmotic water rinsing to normal rinsing. The malfunction will be signalled, but the wash can be continued. Correct operation is resumed when the pressure in the osmotic water circuit is back to normal levels.

**Note: in the same case, by pressing the program button “final rinse” the program “rinse” will be activated.**

The softened water delivery pump (if installed) is controlled by the PLC of the washing unit.

If there is not enough water in the softened water circuit, the pressostat will switch the unit in alarm condition and the relevant alarm message will be shown on the display.

When the water level in the softened water accumulation tank has reached the minimum level, the float switch will open the solenoid valve to convey water directly from the softener unit, until the float switch has reached the maximum level.

In case there is no compressed air, the pressure switch will send a signal to the washing unit.

A thermostat probe checks the outside temperature. When it drops below a pre set minimum value, a solenoid valve (or a water recirculation pump) will be activated to keep a small water flow through the spray gun and brush lance pipes. Another thermostat is connected to a floor temperature measuring probe and switches on the wash bays floor heating system in case of freezing (option).

#### Standard wash programs

(valid for all wash bays)

##### Washing:

using the spraying lance with hot high pressure water and shampoo.

##### Super foam:

using the brush lance with low pressure hot water + shampoo + air.

##### Rinsing:

using the spraying lance with high pressure softened water.

##### Waxing:

using the spraying lance with softened water + wax.

##### Final rinsing with osmotic water:

using the spraying lance with high pressure osmotic water.

In case the osmotic water is not enough, the pressure switch is activated and the program switches automatically to “rinsing”, allowing the customer to complete the wash. An alarm message will appear on the display.

## 7.4 WATER SOFTENER

Check the level of salt in the brine reservoir. It must reach between one quarter and completely full.

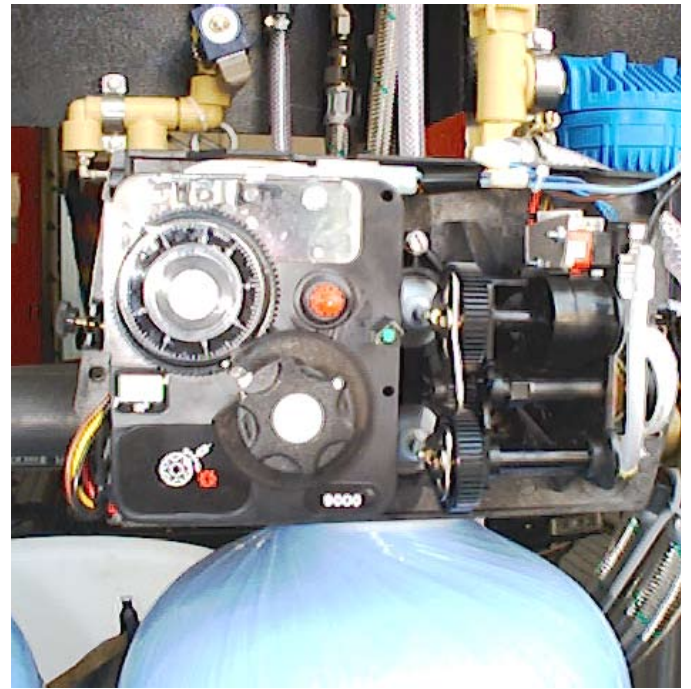
Hardness checking

Use the analisys set to check the inlet water quality. The set includes the relevant instructions to measure the hardness.

### 7.4.1 DOUBLE COLUMN SOFTENER UNIT

After checking the supply water hardness, adjust the regeneration valve according to following table.

Hardness °F	mod.	mod.	mod.
	00AD40 calibration mc	00AD65 calibration mc	00AD100 tcalibration mc
20	7.7	11.4	18.4
30	5	7.5	12.2
40	3.7	5.5	9
50	2.9	4.4	7.2
60	2.3	3.6	5.9
70	1.9	3	5
80	1.7	2.6	4.3
90	1.4	2.3	3.8
100	1.3	2	3.4



### 7.4.2 ONE COLUMN SOFTENER UNIT

Regeneration is time controlled by means of a clock and is normally carried out at night, around 2 a.m.

During the regeneration process, a by pass valve is activated to allow washing operations without softened water.

Take out the valve cap and adjust with the knob (see Fig. 6).

**Note:** Adjustment at the factory was made with supply water hardness 30°F.

Check the efficiency of the softener group by measuring the output water hardness: it should read 0°F

**Note:** TH must be 0°; if not, the wash program configuration must be changed. Call an after sale service engineer.

**Note:** Consult the softener valve instruction manual to modify the operation time of the regeneration cycles.

## 7.5 OSMOSIS GROUP

**Note:** This high technology component cannot work properly if the water hardness delivered by the softener unit is not a  $TH=0^\circ$ .



Check the amount of iron in the water; increase the capacity of the activated carbon filter if it is more than 0,1 mg/litre.

The system includes following components (fig. 7):

- A) Two intake filters
- B) Delivery pump to the osmotic membrane
- C) Osmotic membrane
- D) Flow meter to measure the demineralised water production
- E) Water discharge adjustment flow meter
- F) Operating pressure gauge (regulated at 15 bar (multi stage pump) or 12 bar for centrifugal pump).
- G) Pressure regulating cock (horizontal)
- H) Flow meter to adjust delivery of discharge water (mounted vertically).

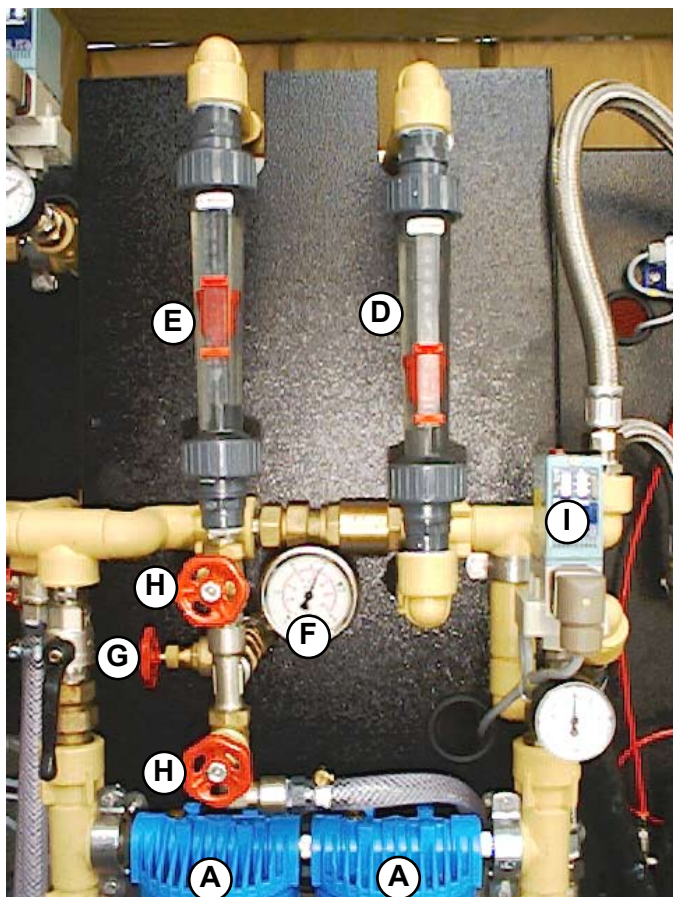


Fig. 7

### Operating principle

The osmosis feed pump is controlled by the float switch installed inside the osmosis tank which starts it if the water level is low.

At the end of the production phase, i.e. when the osmotic water tank is full, softened water is conveyed through the membranes for a few seconds to clean them.

The pump motor works only if the pressure switch that is installed upstream reads a correct pressure level (more than 0,5 bar).

This in order to protect the pump from running dry. The pump starts again automatically when the pressure is above the required minimum level.

The osmosis group is adjusted at the factory. When starting up the unit it is however necessary to check the parameters and confront them with those shown in the table below.

	CENTRIFUGAL PUMP		VERTICAL MULTI STAGE PUMP	
	000S100 0001 Membrane	000S200 N°1 Membrane	000S400 N°2 Membrane	000S600 N°3 Membrane
Working pressure	12 bar	15 bar	15 bar	15 bar
Osmose water prod.				
Right hand flow meter	200	250-300/h	400-500/h	600-700/h
ecirculating water	~500	~ 700/h	~ 400/h	~ 100/h
Drain water	~300	~ 300/h	~ 500/h	~ 700/h

If it is necessary to adjust the parameters, act as follows.

Adjustment of the working pressure and the amount of the discharge water when recycling:

1. Keep the discharge taps open (the vertical ones) and adjust the horizontal tap to reach the required working pressure.
2. The right hand flow meter shall indicate the water production rate as shown in the above table.
3. Adjust the two vertical taps to obtain the discharge water and recirculating water figures shown in the table.

## 7.6 BURNER



See the relevant instruction manual.

Only qualified and authorised engineers are allowed to work on the water heating group.

### Gas/Oil

After the start up it is possible to adjust the water exit temperature on the mixing valve:

temperature should be between 50 and 60 °C max. The machine should be in operation for at least a few minutes before the temperature control.

### Maintenance

Maintenance work on the gas or oil burner must be carried out by **qualified engineers only**, in compliance with current regulations. The engineer must issue the relevant documentation confirming that the unit is in good working order.

The fuel level must be periodically checked.

\*\* See the relevant technical documentation of the burner - Call the authorised after sale service engineer.



The installation and maintenance of the water heating system must be carried out in compliance with the relevant regulations and norm of the country where the washing unit is installed.

In Italy, the personnel in charge of installation and maintenance of heating systems must be approved and authorized according to the law.

For heating systems with power exceeding 35 kW (30.000 kcal/h) it is necessary that all requirements prescribed by the law (namely D.M. 1/12/1975) are fulfilled.

## 7.7 GENERAL CONTROL



Make sure that the safety devices are perfectly efficient and functional before putting the washing system in operation.

Ensure that no element is damaged and all components are correctly installed and perfectly working.

Any hazardous safety device or damaged part must be repaired or replaced by qualified personnel or serviced by an After Sale Service Centre authorised by the Manufacturer



Should the operator feel uncomfortable as regards the washing safety, he must stop the equipment and inspect the area he feels uncertain with and contact the Manufacturer Service Centre.

## 7.8 STORAGE



It is absolutely forbidden to store the crates one on top of the other.

- Should the crates and plants components remain outside for a long period of time before installation, it is necessary to cover them with nylon sheets and protect them from sun heat.
- If the equipment is stored outdoor for a period over three months, it must be sheltered from harsh weather and too high or too low temperatures.

**IN ADDITION TO THE SAFETY RULES CONCERNING WORKING ENVIRONMENTS WHICH ARE DESCRIBED IN THIS MANUAL, THE USER MUST ALSO COMPLY WITH THE LAWS OF THE COUNTRY IN WHICH THE EQUIPMENT IS INSTALLED (D. L. 626/94).**



# SECTION 8

## ENCLOSURES





## ENCLOSURE 2: GUARANTEE CONDITIONS

### WASHING UNITS, WATER RECLAIM UNITS, ACCESSORIES

CECCATO S.p.A. (hereafter called CECCATO) guarantees the products supplied for a period of twelve months from the installation date, however for a total time not exceeding eighteen months from the invoice date

CECCATO also grants, for seven years, the hot dip galvanized and painted steel structure elements of the washing units against perforating corrosion. This under the assumption that the Customer is cleaning the machine at regular intervals, without using aggressive chemicals. Scratches, bruises or other damages of the painted surfaces must be immediately and appropriately repaired to avoid a deterioration of the paint starting from these points.

This guarantee is void if above normal maintenance operations are not carried out.

In the guarantee period, CECCATO will repair or replace free of charge all parts that, in his judgment, were defective from the start, due to material or construction fault.

The customer must send the request for intervention in guarantee directly to CECCATO.

The right for guarantee must be proven by exhibiting the invoice of the machine and the installation technical report, duly filled from authorized technical staff from Ceccato. If the installation technical report is missing, the twelve months of guarantee will begin from the invoicing date.

The guarantee does not cover:

- damages or breakdown caused from transport, in ex works shipments;
- damages or breakdown deriving from inadequate electric, water or compressed air supplies, or from the non-observance by the customer of all prescriptions regarding the regular maintenance operations that are described in this user's manual;
- damages or breakdown deriving from not adequate quality of the water used (excessive hardness or aggressiveness, sand in suspension, etc.)
- consumable materials (brushes, chemical washing products and water reclaim chemicals, active carbons, filters, lubricants, etc.)
- damages to components of the product distribution system caused by the use of washing and water reclaim chemicals that are different from those supplied and recommended by CECCATO.

The guarantee is void when:

- the machine was not installed following the instructions of CECCATO;
- the machine was modified, repaired or was tampered with, by personnel not authorised by CECCATO, or such operations where carried out using non original spare parts;
- the regular periodic maintenance as described in the user's manual, was not carried out;
- the payment conditions that where accepted upon signature of the purchasing contract were not honoured.

Furthermore:

- no compensation will be due for the periods of inefficiency of the machine;
- repairs carried out during the guarantee period do not involve an extension or renewal of the same guarantee;
- the parts replaced under guarantee remain property of CECCATO.





**CECCATO S.p.A.**

Via Selva Maiolo, 5/7

36075 ALTE di MONTECCHIO

MAGGIORE (Vicenza) – Italia

Tel. +39 0444 708441

Fax +39 0444 695544

[www.ceccato-carwash.it](http://www.ceccato-carwash.it)

[info@ceccato-carwash.it](mailto:info@ceccato-carwash.it)

**After Sale Service**



Tel. +39 0444 708488

Fax +39 0444 708483

[service@ceccato-carwash.it](mailto:service@ceccato-carwash.it)

**Spare Parts Service**

Tel. +39 0444 708418

Tel. +39 0444 708489