CECCATO

Hydrus

WASHING AND DRYING AUTOMATIC UNIT

Instructions for its use and maintenance

User manual

ENGLISH
Translation from the original document in Italian language

Issue 08_187	B	22/01/2009	772908_ENG

CE

Before beginning to work with the washing unit, read carefully the use instructions.

Write the machine identification plate data (see paragraph 1.4.2, chapter 1, in points A-B-C-D) in the column below.

A-B	Model of the washing
C	Machine identification number
D	Year of fabrication
	Washing date of delivery

Assistance Center authorised by “CECCATO Spa” to which address for interventions:

CECCATO S.p.A.

Via Selva Maiolo, 5/7
36075 ALTE di MONTECCHIO
MAGGIORE (Vicenza) – Italia
Ph. +39 0444 708441
Fax +39 0444 695544
www.ceccato-carwash.it
info@ceccato-carwash.it

Technical Assistance Service

+39 800 372828

Ph. +39 0444 708488
Fax +39 0444 708483
service@ceccato-carwash.it

Spare parts service

Ph. +39 0444 708418
Ph. +39 0444 708489

Summary

CHAPTER 1

Introductory information

1.1 INFORMATION ON THE HANDBOOK

1.1.1 IMPORTANCE OF THIS HANDBOOK

This manual contains the information, the instruction and everything that is important to know for the correct use and maintenance of the washing and drying unit “HYDRUS”. The handbook, with its relevant enclosures, is the only approved technical documentation and must follow the washing unit to be used as reference during the whole lifetime of the machine.

The following is not a complete description of the different machine components, nor a detailed presentation of their operation mode; nevertheless the user shall find here all the useful information for the safe use and the correct maintenance to keep the machine in good working order.

!

- *The regular operation, the lifetime and the low running cost of the machine depend from the compliance with the instructions in this manual.*
- *The instructions of this handbook are completing, but not replacing all compulsory obligations of the personnel in charge related to safety prescriptions and accident prevention rules in force.*
- *Before starting any operation with the unit, it is compulsory to read this handbook.*

1.1.2 HANDBOOK PROPERTY

1.1.3 VALIDITY

This handbook describes the technical features at the moment of the sale and installation of the machine. The Manufacturer reserve the right to introduce changes in the production and update consequently the relevant use and maintenance handbook, without any obligation to inform the Customer about the said changes.

If the Manufacturer considers some technical information and completions to be useful, the relevant documentation will be sent to the Customers to be added to the manual and become part of it.

The Manufacturer is liable for the Italian version of the handbook (“Istruzioni Originali - Italiano ”).

All copies of the handbook which are translated in the language of the Country of use, will be defined as “translation of the original instructions in Italian language”.

1.1.4 STRUCTURE OF THE HANDBOOK

The user manual includes nine sections (chapters) with following main instructions:

1. Preliminary information
   - □ Presentation of the handbook, terms and symbols used.
   - □ Manufacturer and after sale service organisation.
   - □ Data plate and CE markings.
   - □ Manufacturing reference technical norms and guidelines.
   - □ Information on final demolition and disposal.
2. General warnings
   - □ Allowed and not allowed use of the machine.
   - □ Liability of the Manufacturer
   - □ Reference to the different chapters for information and specific considerations.
3. Description and technical data
   - □ Description of the machine and its components.

- □ Technical specifications.
- □ Arrangements to be made by the Customer.

4. Safety information
   - □ Description and operation of the safety devices installed in the unit.
5. Transport and installation
   - □ Guidelines and information for lifting, transporting and storing the machine.
6. Use of the machine
   - □ Instructions for the correct and safe use of the machine.
   - □ Description and use of the machine controls.
   - □ Description of the procedure for correct positioning of the vehicle and cycle start, with reference to the different possible machine configurations.
7. Maintenance
   - □ Safe maintenance instructions.
   - □ Routine and extraordinary maintenance operations.
8. Appendix
   1. Cards for "comments on the technical assistance interventions"
   2. Normative and legal references
   3. Programming sheet for Hydrus
9. Enclosures

   See par. 1.1.5.

For a detailed description of the chapters' structure, please consult the manual index at the beginning of the document.

1.1.5 DOCUMENTS SUPPLIED WITH THE HANDBOOK

1. Machine overall dimension plan.
2. Wiring diagram.
3. Operator's Panel programming manual (Uni-OP).

1.1.6 WHO IS THIS MANUAL FOR

This manual is a necessary tool for following persons:

- Person in charge of the Safety and Accident Prevention.
- Persons in charge of the transport of the machine.
- Operators responsible for erection and disassembling of the machine.
- Operators responsible for electrical, hydraulic and pneumatic connections.
- Operators responsible for start up of the machine and training of site personnel.
- Operators of the washing unit.
- Persons in charge of machine maintenance.
- Operators responsible of final demolition of the machine.

1.1.7 HOW TO KEEP THE MANUAL

This handbook must be kept in good condition. It must be kept in a suitable and safe place, always accessible for all operators for consultation.

The manual and all further technical documents are originally supplied in a pocket inside the electrical cabinet of the machine.

In case of loss or damage of the handbook and other technical documents, or if further copies are needed, please contact directly the Manufacturer. Please supply the machine serial number written on the machine data plate (par. 1.4.2).

This handbook must be kept for the whole lifetime of the machine, up to its demolition. When the machine is moved to another site, the manual shall be handed over to the new user, along with all other relevant technical documents. The first Customer should send the Manufacturer all necessary information about the new installation site of the machine.

1.1.8 TERMS USED

In the handbook, the washing and drying unit is also defined as “machine or installation”.

USER

The user is the person, the organisation or the company that bought or rented the machine and intends to make a correct use of it.

DANGEROUS AREA

Any area inside and/or near a machine where it is dangerous for a person to stay.

PERSON EXPOSED

Any person who stays in the dangerous area.

OPERATOR

One or more persons in charge of the machine operation, routine maintenance and cleaning.

SPECIALISED STAFF

The specialised staff is the personnel authorised and appointed by the Manufacturer to carry out all or some of the interventions that imply a particular knowledge of the machine, such as:

- □ lifting;
- □ transport;
- □ installation;
- □ start up;
- □ adjustment;
- □ extraordinary maintenance.

AUTHORISED AFTER SALE SERVICE

The after sale service centre is officially authorised by the Manufacturer and is made of specialised staff who is able to carry out all kind of assistance, maintenance and repair works which are required to maintain the high performance level of the machine.

1.1.9 SYMBOLS USED IN THE HANDBOOK

Following symbols are used in the manual to underline very important instructions and warnings for the user of the machine:

	*Very useful information for the user.*
	Important instruction for the operator, concerning safety and precautions to be taken when carrying out specific works.
	*Dangerous operation, health and safety risk for exposed persons.*
	*Prescription to use personal protection devices, for example gloves.*

1.1.10 ABBREVIATION AND REFERENCES

In the text of the manual there are references to specific chapters or paragraphs that are given with following abbreviations:

par. = paragraph

chap. = chapter

The abbreviation is followed by the indication of the charter or paragraph identification number, for example, with

“par. 3.1”

the reader shall refer to paragraph 3.1 of chapter 3.

1.1.11 CONCEPT OF MOTOR VEHICLE

The machine was designed to wash the body of motor vehicles. The term “motor vehicle” defines all different categories of vehicles with at least four wheels, which characteristics and dimensions are compatible with the operation limits of the washing machine.

From now on the terms “vehicle” and “motor vehicle” are considered equivalent.

The machine operation limits are described in chapter 3.

1.2 IDENTIFICATION OF THE MACHINE MANUFACTURER

The washing unit described in this manual is manufactured exclusively by:

CECCATO S.p.A.
Via Selva Maiolo, 5/7
36075 ALTE di MONTECCHIO
MAGGIORE (Vicenza) – Italia
Ph. +39 0444 708441
Fax +39 0444 695544
www.ceccato-carwash.it
info@ceccato-carwash.it

1.3 AFTER SALE SERVICE

For any information about the machine use and maintenance, or the request of spare parts, please contact directly the Manufacturer or the nearest authorised Resale Dealer. It is strongly recommended to use only original spare parts. The Manufacturer grants the delivery of spare parts in the shortest possible time, consistently with the stock availability and the component type. Please do not carry out any repair work or intervention which is not described in this manual.

Call these telephone numbers for after sale service:

Ph. +39 0444 708488
Fax +39 0444 708483
service@ceccato-carwash.it

1.3.1 AFTER SALE SERVICE POINT

For any assistance it is possible to call also the nearest authorised after sale service point, if written in the third page of this manual.

1.3.2 SPARE PARTS SERVICE

Please supply following information when requiring spare parts from the Manufacturer:

- Machine model
- Machine serial number.
- Part number of the required item (see spare parts catalogue).
- Means of transport. In case this point is not specified by the purchaser, the Manufacturer will take care of it, but will not be liable for delays of shipment due to force majeure. The forwarding cost is to be paid by the addressee. All risks and dangers linked to the forwarding of the goods are charged to the purchaser even if it is sold ex works.

Call these numbers for any spare part requirement:

Ph. +39 0444 708418
Ph. +39 0444 708489

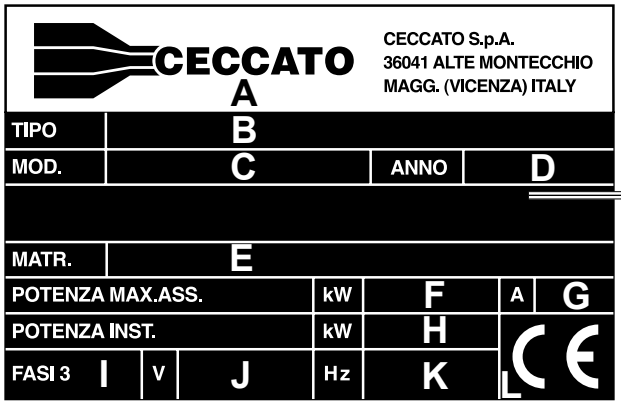
1.4 IDENTIFICATION OF THE MACHINE

1.4.1 NAME

“HYDRUS” is a vehicles washing centre with one mobile gantry.

1.4.2 DATA PLATE

The machine technical data, together with the “CE” marking, are written indelibly on a plate which is fixed to the machine structure. The plate location is shown in the figure.



Following data are written in the plate:

A. Manufacturer name and address
B. Type of washing unit;
C. Washing unit model;
D. Year of manufacture;
E. Serial number;
F. Maximum absorbed power, in «kW»;
G. Maximum absorbed current, in «A»;
H. Installed power in «kW»;
I. Number of phases;
J. Voltage of the machine;
K. Frequency in «Hz».
L. “CE” Marking

!

- *Above machine identification data shall be written also in the second page of this handbook for a quick reference*
- *The machine data plate shall not be removed or replaced; in case of damage, please inform immediately the Manufacturer*

Further technical features are described in chapter 3: “Description and technical data”.

1.5 WARRANTY

The machine is covered by Manufacturer's warranty against manufacturing faults. The guarantee terms are described in the machine contract of sale.

1.6 SUPPLIES AND ARRANGEMENTS IN CHARGE OF THE USER

See chapter 3.

1.7 "CE" CERTIFICATION

The machine described in this manual is manufactured in compliance with the relevant European Community Directives which are in force and applicable at the time of the machine introduction into the market.

This specific type of machine is not included in the Enclosure IV of the machinery directive 98/37/CE, therefore the Manufacturer is providing a self-certification in order to affix the "CE" marking.

1.8 TRANSFER OF THE MACHINE

In case of resale of the machine, the new buyer is entitled to be informed about all technical interventions carried out on the unit. Furthermore he shall receive all machine documentation and the CE conformity declaration.

1.9 DEMOLITION OF THE MACHINE

At the end of the activity, the machine can be dismantled and eliminated. This operation has to be carried out in compliance with the local laws on waste disposal, as well as with the community laws for environment protection (for the countries of the European Community).

The lubrication and/or water circuits have to be emptied out. Oils and lubricants are considered special wastes and therefore must be disposed of following specific procedures.

The electrical and plastic parts have to be separated and sent to specific waste collection points as well.

As for the metal components of the machine, it is enough to divide the steel parts from those of other metals or alloys to ensure a correct recycling.

To carry out the dismantling of the machine first cut all its supplies and connections and then follow the opposite procedure used for its installation described in chapter 5.

CHAPTER 2

General information

2.1 CORRECT USE OF THE MACHINE

"HYDRUS" is a gantry washing centre (machine) for motor vehicles, as described in chapter 3, par. 3.1 of this manual.

With a specific configuration, the machine can be operated in self service mode, using the automatic washing cycles already installed in the unit (see chapter 6 for further details).

The machine is designed to be controlled only by one operator.

See chapter 3, par. 3.5.2, for details on the best conditions to operate the machine.

2.2 USE NOT ALLOWED

The following is forbidden:

- To use the machine in a different way from the one described in point 2.1.
- Washing of motor vehicles which came in contact with inflammable, aggressive, harmful or explosive powders, gases and liquids, or with any product that may cause dangerous reactions when it is mixed with water.
- Use of the machine within an explosive environment (varnish warehouse, classified zones around fuel pumps, etc).
- Use of the machine in places of greater risk in case of fire (classified zones classified around petrol filling stations, warehouses of combustible material like wood, straw, etc).
- Use of the machine to clean persons, animals or any object apart from motor vehicles.
- Washing of motor vehicles which dimensions and features are not suitable for the characteristics of the machine.
- Use of the machine beyond its operation limits (see chapter 3).

! *Any other use of the machine not described in this manual will release the Manufacturer from any liability for damages to persons, animals or things. The warranty on the machine will immediately cease and the User will be solely liable towards any third party.*

2.3 LIABILITY OF THE MANUFACTURER

The Manufacturer rejects any liability arising from the consequences of:

- Wrong preparation of the machine installation site and structures.
- Wrong, faulty or irrational use of the machine, or use of the machine by untrained personnel.
- Failure to comply with national safety and accident prevention norms when using the machine.
- Wrong installation.
- Feeding system of the auxiliary services of the machine with characteristics and parameters different from the compulsory ones.
- Lack or poor maintenance of the machine.
- Modifications or interventions on the machine not allowed by the Manufacturer.
- Use of non original spare parts, or parts which are not suitable for the specific unit type.
- Non compliance, total or partial, with the instructions of this handbook.
- Tampering with the safety devices and with the safety information panels.
- Damages to persons, to vehicles and to the environment caused by the wash chemicals used (see paragraph 2.5)
- Extraordinary events.

! *Carrying out unauthorised modifications of the machine, may cause the cessation of the warranty and the cancellation of the "CE" Conformity Declaration.*

2.4 PREVENTION

2.4.1 MAIN PROHIBITIONS

- Access to the working area during machine operation is not allowed.
- Safety devices and instruction panels shall not be tampered with or removed.
- The machine shall never be operated neither when parts are disassembled, nor bare-footed or by rain or storm.
- Use of the machine by untrained personnel is not allowed (except for machine in self service operation).
- Persons are not allowed to remain inside the vehicle during the washing cycle.
- Washing liquids (water and wash chemicals) shall be used only for the normal machine operation.

2.4.2 SPECIAL PRECAUTIONS

- To clean vehicles with soft-fabric folding roof or which roof is not rigid enough, it is compulsory to activate the washing cycle in modality "vans" (see programming handbook for the details). Damages are however always possible on such vehicles and the Manufacturer will accept no liability.

2.4.3 WORKING AREA

The lighting system of the working area must be in compliance with the laws in force in the Country of installation of the machine and must however guarantee the following conditions:

- Grant a good visibility in every point.
- Not create dangerous reflections for the operator.
- Allow a clear sight of the control panel and the emergency push-buttons.

Above instructions are also valid for indoor installations, as described in chapter 4.

2.4.4 TRAINING OF PERSONNEL

The personnel in charge of the machines which are not operated in self service shall possess or must acquire through adequate formation and training, following capabilities:

- General and technical knowledge of sufficient level in order to understand the content of the handbook.
- Knowledge of the main accident-prevention norms.
- Knowledge of all the controls of the machine and particularly of the procedures for start up, emergency stop and how to put the unit out of service.
- Knowledge of all the systems of protection and emergency installed in the machine.

The operator must be trained also to recognise such interventions which are beyond his task or exceeding his technical knowledge and capabilities. In such cases he shall not intervene, but:

- inform immediately his supervisor;
- stop immediately the machine, using the emergency stop button, and call the supervisor.

! *The instructions of this handbook are a completion of the local laws in matter of safety and accident-prevention and must be strictly followed by all involved persons.*

2.4.5 OPERATORS RECOMMENDED CLOTHING

The clothing of machine operators must be in compliance with the prescriptions of the European Community and/or with the specific norms of the Country of where the machine is installed.

In any case the following is compulsory:

- Use specific clothing. Avoid wearing large and flapping garments: they may be getting caught in the rotating parts. Long hair should be collected.
- During maintenance and repair works it is compulsory to use protective clothing, anti-cut gloves, non-slip and anti-crushing shoes. Wear gloves and goggles when dealing with wash chemicals.

2.4.6 NOISE LEVELS

See chapter 3.0

2.4.7 INFORMATION ON SAFETY – RESIDUAL RISKS

See chapter 4.0

2.4.8 INSTRUCTIONS FOR INSTALLATION AND CONNECTION

See chapter 5.0

2.4.9 START UP AND USE INSTRUCTIONS

See chapter 6.0

2.4.10 MAINTENANCE AND CLEANING INSTRUCTIONS

See chapter 7.0

2.5 ECOLOGY AND POLLUTION

The pollution of the discharged water is caused by the chemical products used for the washing (cleansers, waxes, etc.), as well as by the substances taken of from the surfaces of the vehicles (hydrocarbons, greases, oils, dust, dirt, etc.).

In the following list there are indications on the average pollution level in the waste water discharged by the washing units, after the pre-treatment section (sedimentation and oil separation).

PH		5 - 10
Sedimented solids	ppm	10
COD	ppm	700
Mineral oils	ppm	50
Surface-active agents MBAS	ppm	20
Fe	ppm	2,6
Zn	ppm	1,2
Suspended solids	ppm	150

These features can change according to the quality and quantity of the chemical products used and to the dirt of the washed vehicles.

In order to limit the pollution level, it is recommended to use chemical products supplied by the Manufacturer of the washing unit and to use minimum amounts.

As for the discharge of waste waters coming from the washing unit, follow the local norms.

CHAPTER 3

Description and technical features

3.1 MACHINE DESCRIPTION

The machine is a washing centre for vehicles with one mobile gantry . This means that the gantry roll over the vehicle several times to wash and dry it, whereas the vehicle remains stationary for the whole cycle time.

The process includes a first washing phase with rotating brushes, followed by the drying phase during which the water is blown away from the vehicle surface by means of high pressure air flows. The brushes action is supported by the distribution of water and wash chemicals. Before the drying phase some wax is distributed on the vehicle's in order to make the water flow and obtain a polish finishing of the surfaces.

In addition to the phases of washing and drying, the HYDRUS unit can carry out other processes that can be generally summed up in:

- pre-washing phase
- polishing phase.

A complete washing process is carried out according to the following sequence of operations:

1. pre-washing
2. washing
3. polishing
4. drying

Each phase can be carried out in different ways.

The machine offers multiple choices also in the application of special products which help along the washing and finishing operation such as the pre wash cleaners, the waxes, the polishing products and the osmotic water.

The HYDRUS units are equipped with options such as:

- systems for the distribution of hot/cold pre wash cleaner.
- Systems for the distribution of active foam.

- pre washing system with side and top high pressure water arches.
- pre washing system with side and top medium pressure water arches.
- shifting heads for high pressure washing Robowash ®.
- wheels washer with or without distribution of chemical product
- unit for the distribution of hot/cold and foamed waxes.
- unit for the distribution of polishing products.
- unit for the distribution of osmotic water.

One of the fundamental features of HYDRUS, on top of the quality and speed of the different operations, is the possibility to carry out these operations in the same run, for example:

- Side high pressure and Robowash® together with the brush wash.
- Active foam together with the brush wash.
- Waxing together with the drying.
- Osmosis water distribution together with the drying.

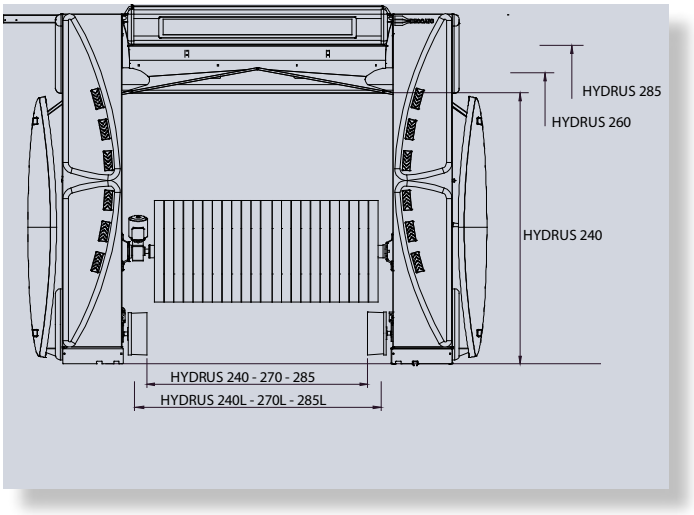
These features allow to shorten the cycle time, with a considerable increase of the unit capacity.

3.1.1 THE HYDRUS RANGE

Hydrus is available in two versions. One version features the well known contour following top drying system; the other one is equipped with two oscillating drying blowers that are fitted on the gantry top cross beam. The “AirPlus” range includes all machines that are equipped with the oscillating blowers.

All versions can be supplied with different washing heights and widths, as shown in the drawings at the side and in paragraph 3.5.7

In the following descriptions of the machine operation mode and of the technical equipment, we will make reference mainly to the version with the traditional contour following drying system.



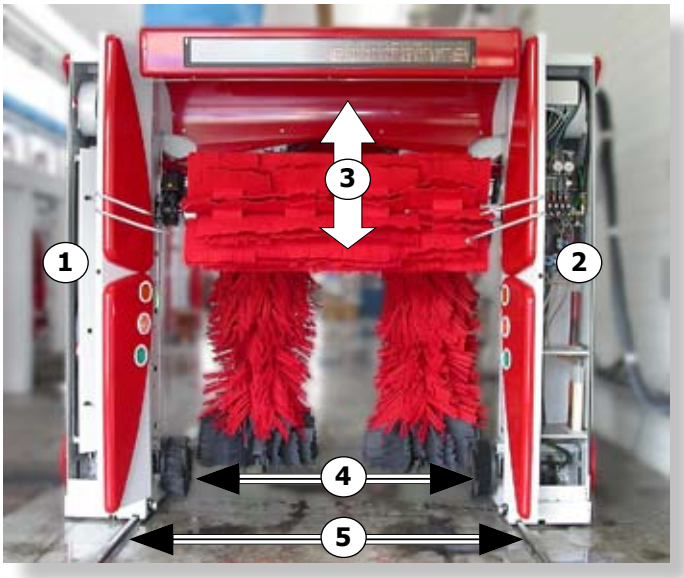
3.2 MAIN COMPONENTS

3.2.1 BLOCK LAYOUT OF THE MACHINE

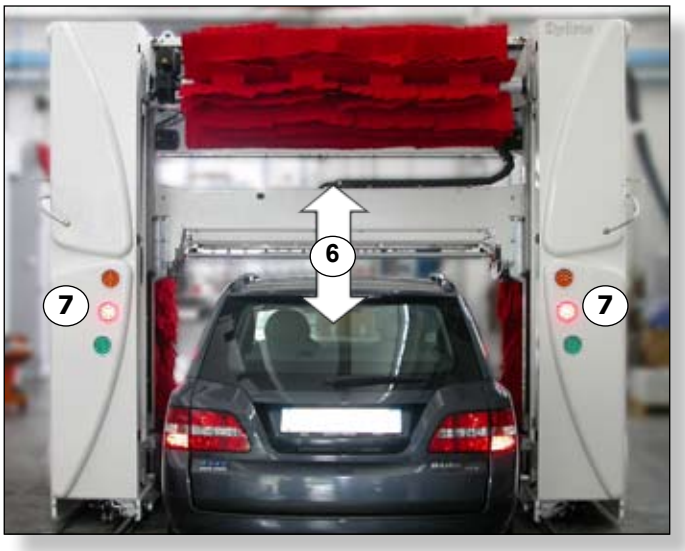
1. Working area, marked on the floor and equipped with warning signals.
2. Hydrus washing unit
3. Gantry sliding rails.
4. Structure for the movement of the energy chain.
5. Control desk.
6. Self service control station (option)
7. Technical room (high pressure pumps, osmotic water, etc.)

3.2.2 MAIN COMPONENTS OF THE MACHINE

1. Gantry column containing the electrical cabinet
2. Column containing the hydraulic equipment
3. Top brush equipped with up and down movement (n. 1)
4. Wheel wash device, with rotating brushes (option)
5. Gantry rails (no. 2)

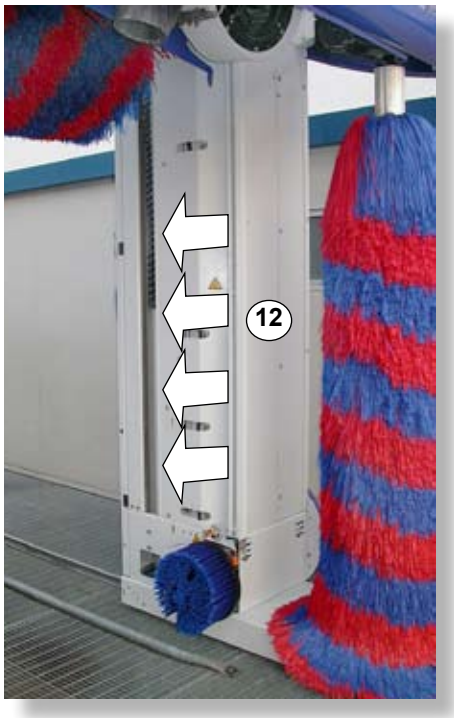


6. Contour following top dryer with integrated blowers. The optional horizontal medium pressure washing arch can be fitted to the top dryer structure.
7. Signalisation and positioning device.



8. Side brushes (no. 2) with cross movement
9. Splash guards (no. 2)
10. Support frame of the cable and pipes energy supply chain.
11. Electrical box to connect the power supply and the external units.

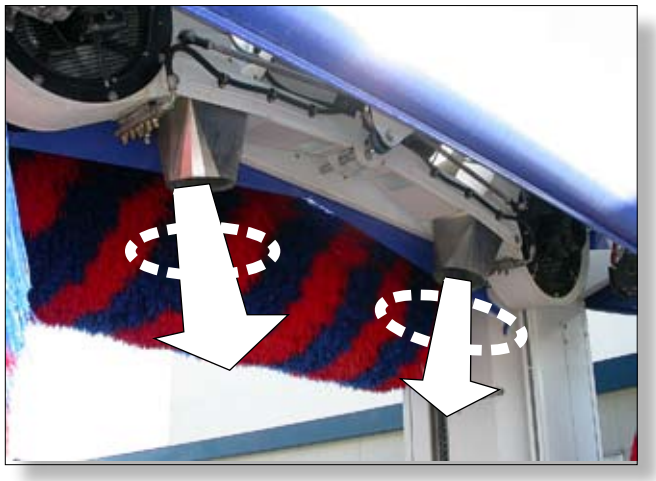
12. Side drying system, including two vertical nozzles. The side nozzles are embedded into the gantry columns and the air blowers are mounted on the top of the same columns.



3.2.3 HYDRUS AIRPLUS

The drying system includes:

1. Top section, including two oscillating drying nozzles, installed under the gantry top cross beam.
2. The vertical working group includes two side drying nozzles which are mounted on the opposite gantry columns. Each nozzle is equipped with one air blower, fitted on top of the relevant gantry column.



3.2.4 MAIN COMPONENTS INSIDE THE STRUCTURE

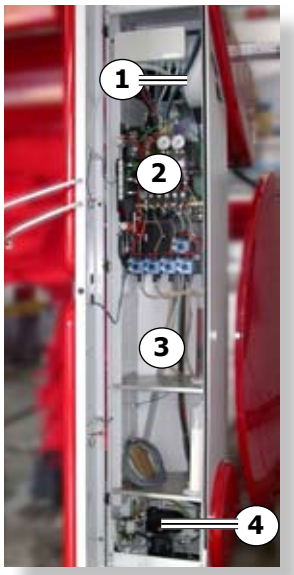
Left column (picture A)

1. Display control device.
2. Left side blower
3. Electric cabinet
   - □ Lock with key (no.1)
   - □ Circuit breaker with key lock.
   - □ Locks with key (no.2)
   - □ Electric cabinet data plate
4. “Robowash” washing unit (option)

Right column (picture B)

1. Right side blower.
2. Hydraulic and pneumatic switchboard
   - □ Compressed air connection
   - □ Water connections
   - □ Set of wash chemicals pneumatic dosing pumps.
3. Shelfs of the wash chemical cans.
4. Robowash washing unit (option).

A



B

3.2.5 DESCRIPTION OF THE GROUP OF NOZZLES

Detailed information about the nozzles adjustment is given in chapter 7.

“Front shampoo” nozzles

“Front shampoo nozzles” are fitted in order to deliver shampoo and foam before the top brush. Two units are installed.

They can be used in the following ways:

- □ Distribution of foam during the brush wash.
- □ Distribution of foam, in the separate wash runs.
- □ Distribution of standard shampoo .
- □ Rinsing.

Top water nozzles

Two nozzle sets are installed to distribute water on the top brush.

Vertical water delivery arches

These nozzles are used to distribute water on the vehicles' sides and on the side brushes

They can be used in the following ways:

- □ Distribution of foam during the brush wash.
- □ Distribution of foam in the separate wash runs.
- □ Distribution of standard shampoo.
- □ Rinsing.

High pressure top and side nozzles

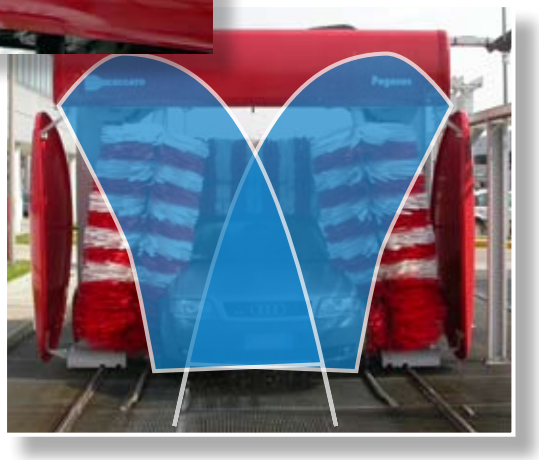
These nozzles have a double function:

- □ Distribution of pre-wash chemical with low pressure water to soften the grim and dirt.
- □ Removal of grim and dirt from the vehicle's surface with powerful high pressure water jets.

Rear nozzles

The nozzles can have following functions:

- □ Rinsing of the vehicles in forward run.
- □ Wetting of the surfaces before the side brushes in the backward runs.



Wax nozzles

Nozzles “waxes” equipped in two units, placed in the front part and out of the top brush. If there is the optional boiler, these nozzles can work with hot, tepid and cold water. They can be used in the following ways:

These nozzles are used for following functions:

- □ Distribution of wax beyond the top brush (during brush wash backward runs).
- □ Separate gantry wax run.
- □ Distribution of wax during the drying forward run.
- □ Separate gantry run with osmotic water.
- □ Distribution of osmotic water during the drying forward run.
- □ Rinsing.

3.2.6 VEHICLE'S POSITIONING DEVICES

3.2.6.1 Traffic lights

The signalisation system includes traffic lights with three-colour lamps, fitted at the entry side of both gantry columns.

Following is the meaning of colours (from top to bottom):

Yellow = vehicle backward movement

Red = vehicle stop

Green = vehicle forward movement

The traffic lights or the Leds are controlled by the interception of two inclined photocells which detect the presence of the vehicle in the bay.

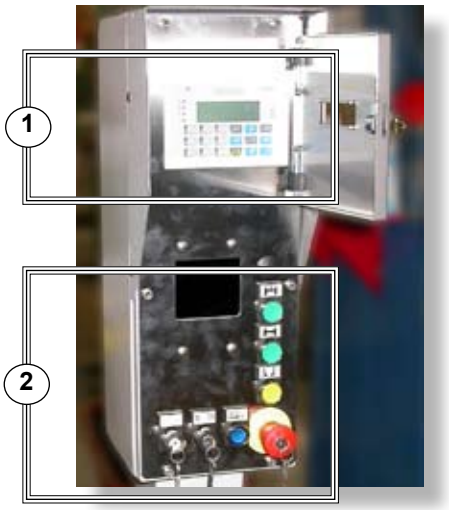
3.2.6.2 Positioning start board (optional)

It is a vehicle's position device that can be installed as an alternative to the standard photocells system. The customer must drive the vehicle forward and place the left front wheel in the centre of the start board, following the indications of the traffic lights.

3.2.6.3 Digital text display (option)

The device is fitted to the top of the gantry, when you look at it from the entry side of the vehicles, and is a very effective means to supply information to the car wash user. It includes a programmable led panel that can visualize texts in a dynamic way, with horizontal or vertical movements, with different graphical effects. The information can include: programmable advertising messages, instructions for the positioning of the vehicle, information about the wash phase, alarm messages, machine state messages, date, time, etc.

3.2.7 CONTROL DEVICES



3.2.7.1 Control panel

The standard control board of the machine, shown in the picture on the side, is installed on top of a column anchored to the floor, outside the dangerous area.

At the side of this column it is possible to place another support post equipped with the payment system or with the additional pushbutton panel.

The panel is divided in two parts:

1. Operator panel
2. Electromechanical controls and signals.

3.2.7.2 Operator's panel

Operator panel with soft-touch keyboard and back lighted LCD display.

Following functions and controls are possible from the operator's panel:

- Information about the state of the machine, the current wash cycle, the alarms.
- Selection of the wash cycle.
- Activation of special functions (frost protection, SMS, etc.)
- Visualisation of stastistical data.

The access to the system parameters is limited by two-level passwords.

Further information is given in the enclosed relevant programming manual.

3.2.8 SUPERVISION AND CONTROL DEVICES

3.2.8.1 Remote diagnostic via SMS (optional)

Diagnostics interface and two-way exchange of information between the unit and the GSM system (mobile telephone or modem connected to a Personal Computer).

Please refer to the UniOP manual.

3.2.8.2 Remote diagnostic through WEB (optional)

Using a personal access code, the site manager can establish a connection with the Ceccato web site and receive technical information and operation data about the washing machine, such as:

- Machine is in normal operating conditions.
- System diagnostic (remote troubleshooting from Ceccato)
- Water consumptions and cycle times.
- Active alarms.
- Total and daily wash cycle numbers.
- Wash bay video surveillance through multiple web-cam system.

3.2.9 SELF SERVICE CONTROL DEVICES

3.2.9.1 Payment station with 5 washing programs

It can be provided with two different configurations, with one or more payment systems:

1. introducing the right amount of banknotes, coins or tokens to reach the price of the selected wash program.
2. loading the electronic key through the banknote reader or the coins or tokens box.

The display (3) will show the amount of money entered or the amount loaded in the key.

The washing program is then selected by pushing one of the 5 buttons (4) to start the cycle.

3.2.9.2 Magnetic card reader

Device to read the magnetic cards for single or multiple washing programs.

3.2.9.3 Reader of standard cards with 8 washing programs

It works with programmed cards.

3.2.9.4 Payment station with 6 washing programs

It works with tokens or coins.

3.2.9.5 PSD CODAX

The device includes a main unit (A) with printer, placed in the kiosk and a remote unit (B) usually placed close to the washing machine. After payment , a ticket with a random 6 figures number is issued by the main unit. The user goes then to the remote unit and digits the number on the keyboard to start the washing cycle.

3.3 LIST OF THE OPTIONS

Supervision and control devices

- Remote control through SMS

Self-service payment systems

- Banknotes, coins and key reader
- Standard cards reader
- Magnetic cards reader
- PSD Codax

Vehicle's positioning devices

- Digital text display
- Start board
- Wheel driver
- Addition photocells for cycles in short bays.

High and medium pressure pre washing

- Total high pressure in one run
- Total high pressure in two runs
- Side high pressure in one run
- Side and top medium pressure
- Robowash / Triwash, can be linked to any of the above options.

Washing groups

- Wheel wash brushes
- Underchassis wash

Special treatments

- Side pre wash chemicals
- Active foam
- Foam wax
- Additional wax
- Foam Polish polishing system
- Sonax polishing system
- Lotus polishing system
- Wheel rims cleaner
- Hot pre wash chemical - wax
- Rinsing with osmotic water

Brushes

(Standard brushes in polyethylene).

- Foam touch
- Fabric
- Other kinds of brushes on demand.

Auxiliary devices

- Boiler
- Osmotic water
- Automatic frost protection
- Hydraulic drive short track device
- Doors control

Claddings and brushes colours

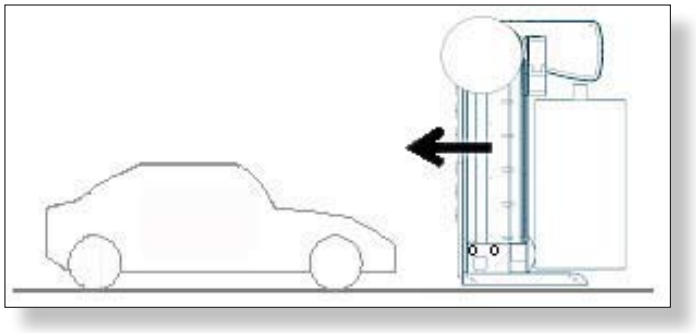
(Metal frame std. colour: white RAL 7035)

- Claddings red RAL 3002 with brushes white-red
- Claddings blue RAL 5002 with brushes blue and rainbow.
- Other configurations and colours upon request.

Other options

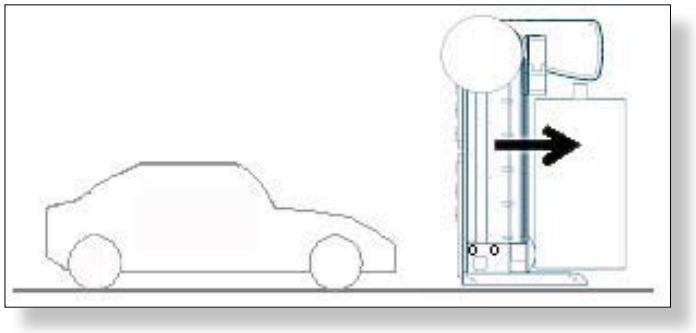
- Coloured or transparent side guards
- Installation of chemical products outside
- Centralised manual lubrication

3.4 CONVENTIONS



Gantry forward movement

FORWARD movement means that the gantry is in front of the vehicle and moves forward to get close to it .



Gantry backward movement

BACKWARD movement means that the gantry is in front of the vehicle and moves backward to get away from it.

Left and right side

The definitions “right” and “left” refer to the front view of the machine, the vehicles’ entry side

A. Left side.

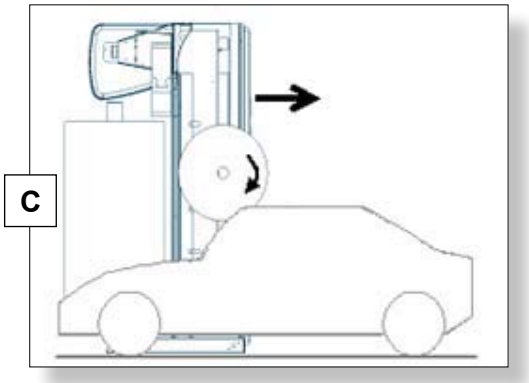
B. Right side.

Brushes rotation

The direction of rotation of the brushes can be either “climbing” or “counter-rotating” in relation to the gantry movement.

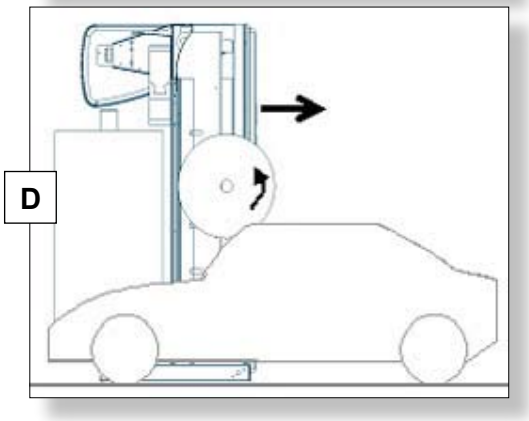
“Climbing” rotation

See figure C



“Counter-rotating”

See figure D



These indications are the same for the side brushes.

3.5 TECHNICAL FEATURES

Except where expressly indicated, the technical data given in the next paragraphs applies to all Hydrus versions.

3.5.1 CONNECTIONS

Recycled water ..... G 3/4”
Clean water ..... G 1/2”
Water pressure ..... 3-4 bar (45-60 PSI)
Compressed air ..... G 1/4”
Air pressure ..... 7-8 BAR (100-115 PSI)
Osmotic water..... G 1/2”

Max power absorption (*)	with boiler	kW (Hp)	18 (24)
	without boiler	kW (Hp)	12 (16)
Max power required (*)	with boiler	kW (Hp)	24 (32)
	without boiler	kW (Hp)	18 (24)
Power supply		V	See plate
Frequency		Hz	See plate

(*) Power absorbed by the light panel, pumps and other is not included.

Please see following table to calculate the total installed power of a given configuration

Pumps power	**kW (Hp)**
Recycled water supply pump	1,5 / 3 / 4 (2 / 4 / 5,5)
Fresh water supply pump	1,5 / 3 / 4 (2 / 4 / 5,5)
Robowash / triwash feeding pump	5,5 / 7,5 (7,5 / 10)
No. 1, 2 or 3 high pressure feeding pumps	7,5 (10)
Medium pressure feeding pump	5,5 / 7,5 (7,5 / 10)
Underchassis feeding pump	4 (5,5)

3.5.2 REQUIRED ENVIRONMENTAL CONDITIONS FOR MACHINE EXPLOTATION

The washing unit can be installed:

- on forecourts, in the open air;
- indoor, in suitable wash bays;
- in service stations, at a distance of minimum 10 m (32ft) from gasoline / diesel oil / gas filling pumps and from the fuel tanks filling pits; in any case well outside of the dangerous zones classified under the norms in force (see chapter 8, par.8.3);
- at a distance of at least 10 m (32ft) from residences or other buildings used for commercial activities, offices or business;
- allowed operation temperatures: +1/+40° C (33.8-104°F), also with the presence of persons;
- relative humidity: 80 % maximum;
- maximum height above sea level: 1500 m (4900 ft);
- absence of corrosive, combustible or explosive dust;
- absence of corrosive and combustible liquids and aerosol products.

Special contractual agreements are necessary if above conditions cannot be met.

3.5.3 QUALITY OF THE WATER

The correct operation of the washing unit is guaranteed only if the supply water complies with following characteristics:

Clean water:

PH			6-8			
Hardness	°F	°T	< 30	< 16,8	< 50	< 28
	°I	°USA	< 21	< 17.4	< 35	< 29
TDS total saltiness	(ppm)		< 3000		< 1500	
Max Turbidity	(NTU)		1			
Free chlorine	(ppm)		-		< 0.1	
Iron			< 2		< 0.05	

Recycled water (partial recycle) guaranteed 70-80% according to the unit, HP Wash bays excluded:

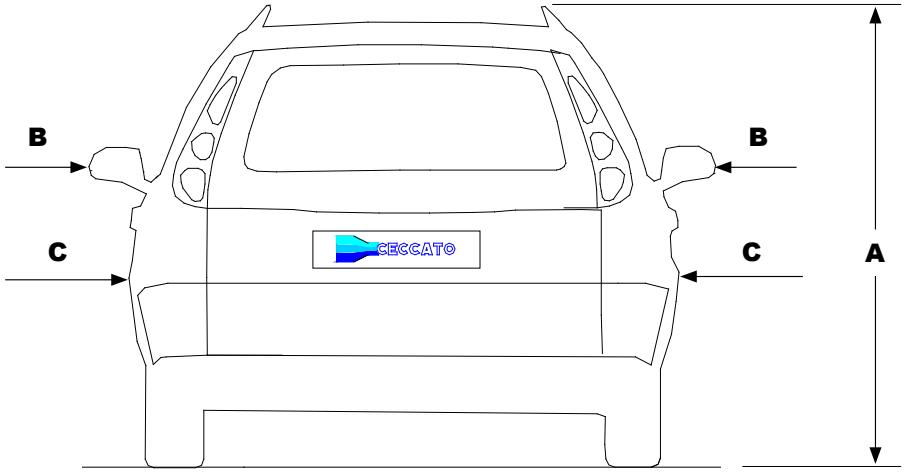
PH			5.5-9.5			
Total suspended solids	(ppm)		< 25			
COD	(ppm)		< 500			
Hardness	°F	°T	< 30	< 16,8	< 50	< 28
	°I	°USA	< 21	< 17.4	< 35	< 29
Total hydrocarbons	(ppm)		<10			
Total surface-active agents	(ppm)		< 4			

Recycled water (total recycle) only in units with brushes

PH			6.8	
Total suspended solids	(ppm)		< 25	
COD	(ppm)		< 100	
Hardness	°F	°T	< 30	< 16,8
	°I	°USA	< 21	< 17.4
Total hydrocarbons	(ppm)		Absent	
Total surface-active agents	(ppm)		< 0,5	

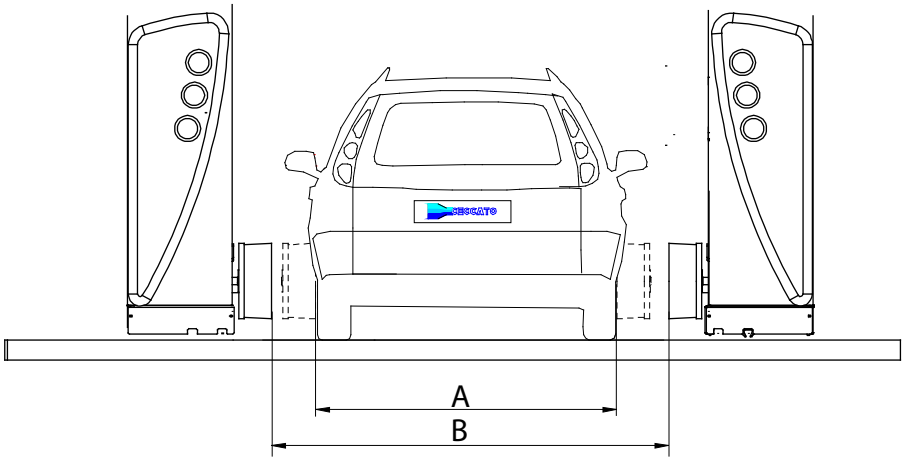
In case the above parameters are not met, Ceccato is available to study and offer the best treatment system to obtain the required water quality.

3.5.4 MAXIMUM VEHICLE SIZE



		HYDRUS			
		225	240	260	295
Washing useful heights mm (in)	A	2250 (88”)	2400 (94”)	2600 (102”)	2950 (116”)
Max. passage width mm (in)	B	2400 (94”) / 2700 (106”) **			
Washing useful width * mm (in)	C***	2100 (82”) / 2400 (94”) **			
* bodywork without ledges (mirrors, etc.) ** Hydrus L2700 *** Vehicle with normal shape and correctly positioned in the middle of the wash bay					

3.5.5 WHEEL WASH UNIT OPERATION LIMITS

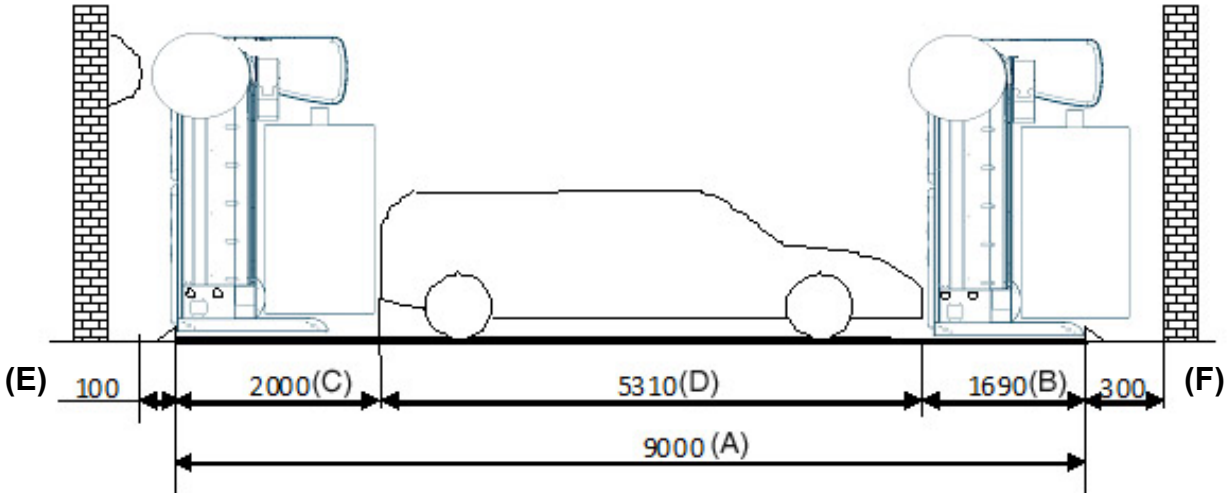


	Hydrus *225 - 240 - 260 - 295*	*Hydrus* *225L - 240L - 260L - 295L*
(A) Minimum distance between wheels mm (in)	1120 (44”)	1420 (56”)
(B) Max. wheel wash passage width mm (in)	2040 (80”)	2340 (92”)
The wheel wash width may be adjusted ± 6 cm		

3.5.6 USEFUL WASHING LENGTH

3.5.6.1 Unit with standard rail length

With the standard length rails of 9 metres (29ft 1/2) it is possible to carry out a complete wash of a 5,3 m (17ft1/2) long vehicle, as shown in the following drawing.



Legend

A. Standard rail length: 9000 mm (29ft 1/2)
B. Space needed in front of the vehicle: 1690 mm (5ft1/2)
C. Space needed behind the vehicle: 2000 mm (6ft1/2)
D. Maximum vehicle length: 5300 mm (17ft)

In case of indoor installation, check the minimum distances from the machine side frames to the walls and the space remaining between the machine and the entry and exit walls/doors when the unit is positioned on both rails limit switches.

3.5.6.2 Unit with special rail length

Increasing the rail length

By increasing the rails length, the washing length will be increased by the same length.

Rail length m - (ft)		Vehicle length m - (ft)
(standard)	9 - (29$^{1/2}$)	5,3 - (17)
	10 - (32$^{3/4}$)	6,3 - (20)
	11 - (36)	7,3 - (24)

Decreasing the rail length

By diminishing the rails length, the washing length will be decreased by the same length. Please take into account that the machine will in any case carry out the wash cycle. The wash will be completed on all those vehicles which length is compatible with the rails size, whereas some of the operations could be carried out only partially or not carried out at all on longer vehicles.

Rails length m - (ft)		Vehicle length m (ft)
(standard)	9 - (29)	5,3 (17)
	8 - (26)	4,3 (14)
	7 - (23)	3,3 (10)

3.5.6.3 Unit with “short bays” photocell

The installation of this device in short bays allows an increase of the washing length of at least 60 cm.(23”$^{1/2}$)

- □ Maximum vehicle’s wash length with standard rails will be 5,9 m (232”)

3.5.6.4 Units with short-track device

With the installation of the short-track device, the washing length can be increased by 1,3 m (51”) in relation to the standard.

- □ Maximum vehicle’s wash length with standard rails will be 6,6 m (260”)

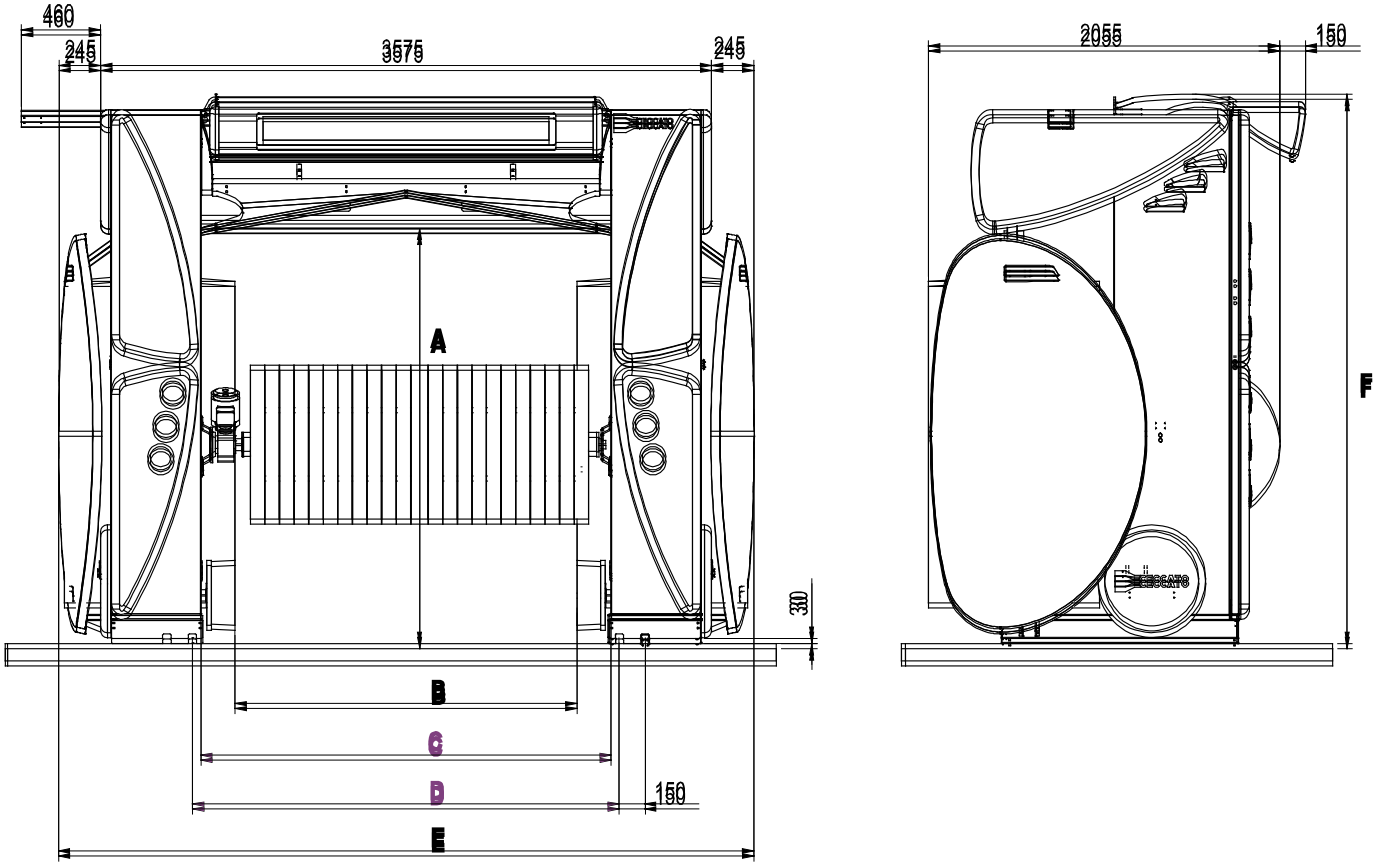
3.5.6.5 Units with start board (threadle) positioning

On machines equipped with standard rails, the washing length could be diminished up to 500 mm (19”), depending on the length of the vehicles’ fore carriage.

Longer rails should be installed to solve this problem, taking into account that the overall length required to install the machine will be increased.

- □ Maximum vehicle’s wash length with standard rails will be 4,8 m (189”)

3.5.7 SIZES

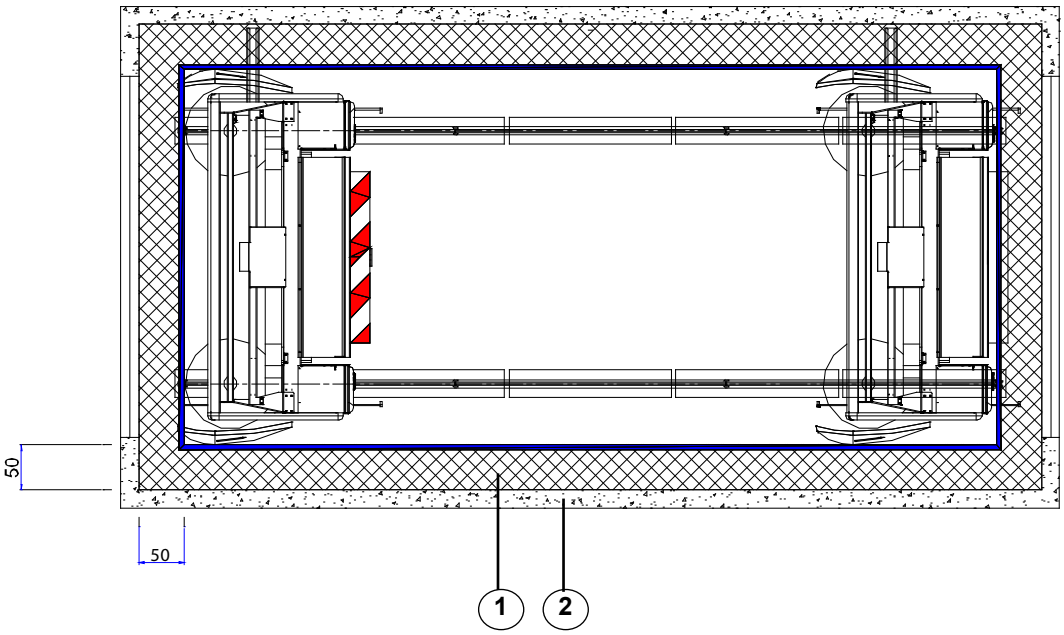


			HYDRUS			
			225	240	260	295
Total weight (#)	kg	(lb)	1600 - 1700 #(3500 - 3800#)			
Height (A)	mm	(in)	2280 (89”3/4)	2430 (95”3/4)	2630 (103”1/2)	2980 (117”1/4)
Width (B)	mm	(in)	2000 / 2300 # (78”3/4 / 90”1/2#)			
Width (C)	mm	(in)	2400 / 2700 # (94”1/2 / 106”1/4#)			
Rails distance (D)	mm	(in)	2500 / 2800 # (98 1/2 / 110 1/4#)			
Width (E)	mm	(in)	4065 - 4365 **			
Height (F)*	mm	(in)	3065 (120”3/4)	3215 (126”1/2)	3415 (134”1/2)	3765 *(148”1/4)*

(#) HYDRUS L2700

(*) With or without the display

3.5.8 INDOOR INSTALLATION



The washing unit HYDRUS can be installed in closed bays.

In compliance with the applicable technical norms, if the machine is installed in a closed bay, there shall be at least 50 cm (19"3/4) of free space (1) around the perimeter (2) which encloses the working area of the unit.

When the necessary space is restricted, for example by columns, the minimum safety distance must be increased by the size of said obstacles.

If, for any reason, such space is not available, it is compulsory to install specific safety devices , see paragraph 4.4, chapter 4.

If the safety devices are installed later on, for example after moving the machine to another site, the engineer in charge of the installation shall supply an updated handbook, or add following documents to the existing manual:

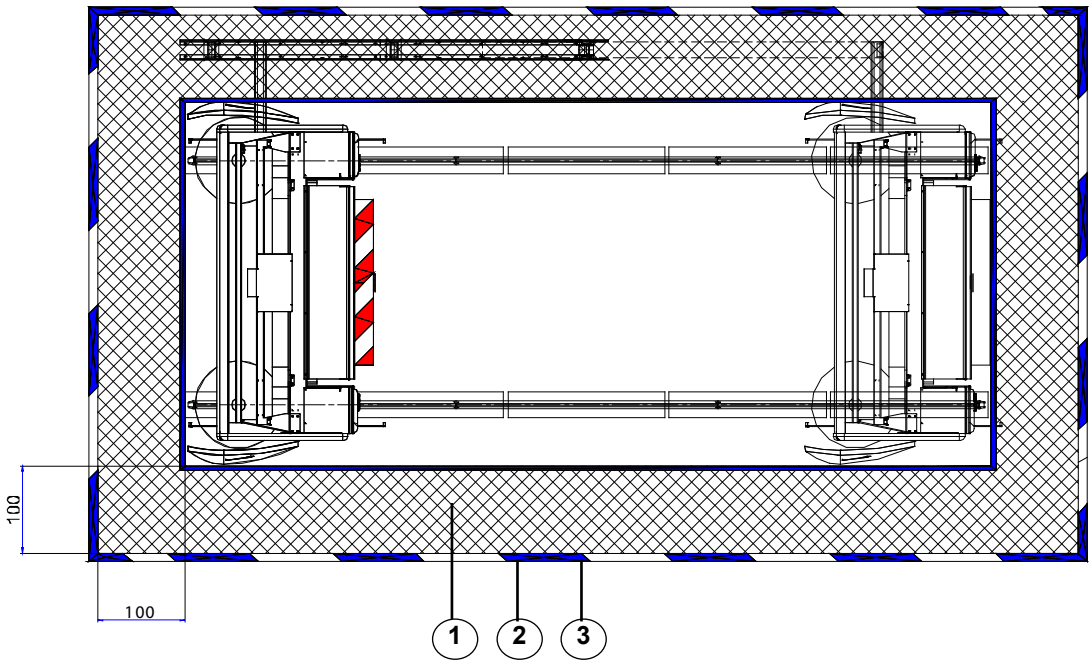
- technical cards and drawings;
- commercial components certificates;
- description of system operation;
- analysis of risks.

! *The safety system described above becomes part of the washing unit and therefore must be tested with it.*

As for the dimensions, see the foundation plan of the specific unit.

Further information on this issue is given in section 4.

3.5.9 OPEN AIR INSTALLATION



It is necessary to leave at least 100 cm (39”1/2) free space (2) around the perimeter (1) which encloses the working area of the unit.

The area should be marked by yellow and black stripes (delivered with the machine) on the floor (3). The stripes shall be fixed to the floor after completing the installation of the machine and before the unit is handed over to the customer.

Warning panels shall be installed at the four corners of the operation area (see par. 4.5.3).

! *The installation work can not be considered as completed if the working area has not been marked with the coloured bands and the warning panels are not in place.*

Further information on this issue is given in section 4.

3.5.10 MIXED INSTALLATIONS - Guidelines

"Mixed" are those open air installations where there are some side and/or front limitations.

In these cases it is necessary to comply with the norms in force for both types of installation; for the open air part it is compulsory to limit the dangerous area with yellow and black stripes, while for the area with side or front obstacles the same safety devices used in the closed bays should be installed.

! *The above described norms regarding the safety devices to place when the space around the machine is less than 50 cm* (19"3/4*), are valid also in case there is only one concerned point in the whole perimeter of the unit's area (for example a column, part of side wall, etc).*

If, after the preliminary checks of the safety conditions of the selected installation area, the safety requirements described in the previous paragraphs are not granted, please do not proceed with the installation of the machine, but get in touch with the Manufacturer's technical department for instructions.

3.5.11 NOISE LEVEL

The sound level has been measured in compliance with the norm ISO 3746, using the control method of surface enveloping on a reflecting plane.

The table below shows the noise levels that are generated by the machine during the phases of brush washing, high pressure washing and drying.

! *The User shall inform the site personnel about the danger connected to the noise level and comply with the relevant local norms.*

PHASE	Sound pressure level db(A)
Brush wash	88,6
High pressure wash	98,4
Drying	104,5

3.6 PRE-ARRANGEMENTS AND SUPPLIES

3.6.1 TO BE PROVIDED BY THE USER

The User is in charge of the following supplies, if not otherwise agreed:

- Preparation of the installation area including possible civil works and/or required ducting.
- Power supplies necessary for the machine operation and their connections in compliance with the local norms.
- Preparation of an efficient earth system and specific connections in compliance with the local norms.
- The supply of the required ancillary hydraulic components, such as pumps, water softeners, etc.)

A detailed hydraulic and pneumatic connection plan is supplied together with this handbook.

Concerning the electrical connection, please consult the enclosed wiring diagram where you can find following information:

1. number of phases;
2. minimum cables section;
3. installed power;
4. maximum absorbed power;
5. characteristics of the current operated earth leakage circuit breaker to protect the power supply line.

The data of items 1,2,3,4 are written also on the machine identification plate (see paragraph 1.4.2 chapter 1).

3.6.2 MACHINE KEYS

The machine is supplied with following keys:

1. One pair of keys to open the door of the electrical cabinet and the door of the cabinet containing the wash chemical cans on the gantries' columns.

   For shipment reasons, all keys are placed inside the gantries' columns, which are kept closed during transportation by plastic straps.
2. One pair of keys to unlock the switch-on selector of the machine.
3. One pair of keys to lock or unlock the selector switch for the activation of the machine operation in self-service mode.
4. One pair of keys to lock or unlock the emergency stop button on the remote control panel.

! *All keys supplied with the machine shall be kept in a safe place and accessible only for authorized personnel.*

The use of the keys , items 2-3-4, is described in chapter 6, paragraph 6.2

CHAPTER 4

Safety information

4.1 FOREWORD

This chapter gives information about the safety devices installed in the machine and about the risks that could not be eliminated when designing the equipment (residual risk). The machine operators are exposed to such risks when working with the washing unit.

Information and warnings about the correct and safe use of the machine are given in chapter 6.

4.2 DANGEROUS AREAS

4.2.1 INDIVIDUATION OF THE DANGEROUS ZONES

Dangerous areas are those zones where mechanical elements any kind of are operating and moving (for example the brush trolleys, the gantries, the brushes, etc.), or where liquids or air under pressure or nebulised chemicals are distributed.

The sources of danger are therefore inside the machine operating area, as well as in the surrounding atmosphere under particular wind conditions.

The environmental aspect is dealt with in paragraph 4.5 (residual risks) and in the paragraphs of chapter 6 regarding the correct use of the machine.

4.2.2 MARKING OF THE DANGEROUS AREA

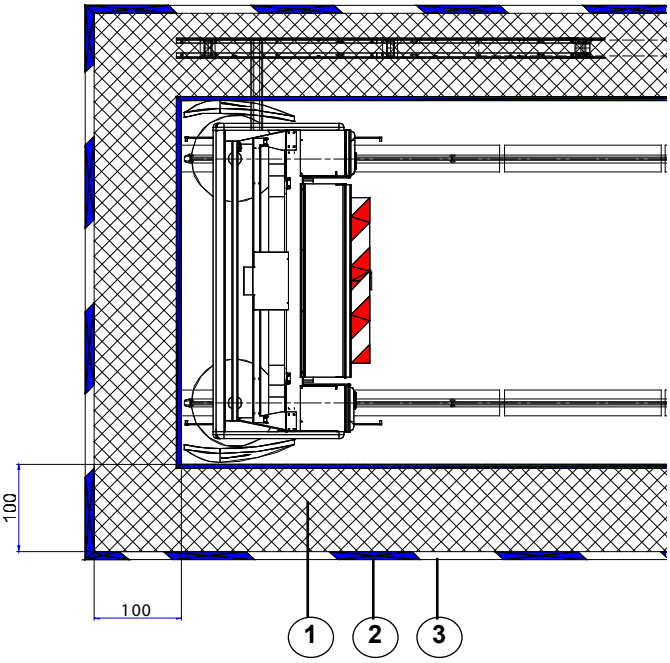
4.2.2.1 Outdoor installation

When the washing unit is installed in the open air, the free space (1) around the perimeter (2) enclosing the operation area (dangerous zone) must be at least **100cm** (39"1/2) wide.

The area shall be marked on the floor with the yellow and black bands (3) supplied by Ceccato together with the machine.

Above bands must be placed to the floor after erection and start up of the machine, before the User takes over full responsibility of the installation.

Then the panels with the warning signs and instructions must be fitted at the four corner of the dangerous area (see paragraph 4.5.3).

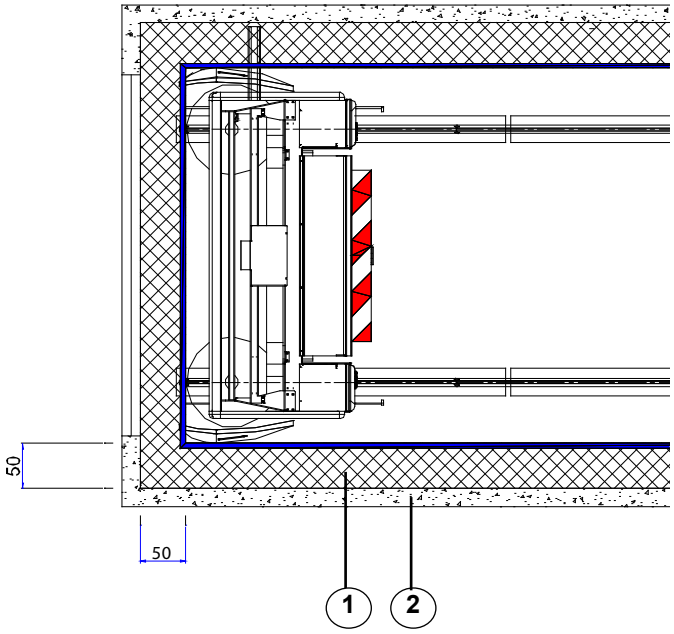


The outdoor installation is not complete and cannot be put in operation before marking of the dangerous area with the floor band and placing of the instruction panels.

4.2.2.2 Indoor installation

When the washing unit is installed in a closed bay, the distance (1) around the operation area perimeter (dangerous area) to the wash bay walls (2) must be at least **50 cm** (19"3/4).

If the free space (distance) is interrupted by columns or other obstacles, the minimum distance must be increased accordingly.



Indoor installations with reduced free space

If the available free space is less than 50 cm (19"3/4), the machine must be equipped with safety devices to grant a minimum safety level, in compliance with accident prevention norms.

Such devices are described in paragraph 4.4.

Successive installation of safety devices

If the safety devices are installed later on, for example after moving the machine from outdoor to a closed bay, an authorized engineer shall install the above mentioned safety devices and supply following technical documentation:

- technical cards and drawings;
- commercial components certificates;
- description of system operation;
- risk analysis.

! *The additional safety system becomes part of the washing unit and must therefore be tested with it.*

4.2.2.3 Mixed installations - Guidelines

"Mixed" are those open air installations where there are some side and/or front limitations.

In these cases it is necessary to comply with the norms in force for both types of installation; for the open air part it is compulsory to limit the dangerous area with yellow and black stripes, while for the area with side or front obstacles the same safety devices used in the closed bays should be installed.

! *The above described norms regarding the safety devices to install when the space around the machine is less than 50 cm* (19"3/4)*, are valid also in case there is only one concerned point in the whole perimeter of the unit's area (for example a column, part of side wall, etc).*

If, after the preliminary checks of the safety conditions of the selected installation area, the safety requirements described in the previous paragraphs are not granted, please do not proceed with the installation of the machine, but get in touch with the Manufacturer's technical department for instructions.

4.3 OPERATION MODE

4.3.1 CONTROL POST

The operator control post is outside of the working area, which is marked on the floor with yellow and black stripes, in front of the remote control panel.

From this position the operator shall have full control of the machine during all phases of the wash cycle in order to react immediately when required.

4.3.2 NUMBER OF OPERATORS

The machine was designed in order to be operated by one trained and adult operator (self service operation excluded).

4.3.3 WORKING ZONE

The working area includes the space needed for machine operation (dangerous zone).

In this zone the operator in charge of the machine operation shall guide the wash customers by the positioning of the vehicles under the wash gantry. When the vehicle is in place, the operator opens the door to let the driver go out, inviting him to move to the waiting area outside of the dangerous zone, i.e behind the yellow and black stripes on the floor.

⚠ *Persons are not allowed to stay inside the vehicle during the wash.*

4.3.4 WAITING AREA

After leaving the vehicle, all occupants shall move to a distance of at least 5 meters outside of the working zone which is marked on the floor by yellow and black stripes and wait there until the wash is finished. This safety distance is required to avoid any contact with nebulised pre-wash chemicals.

The driver shall enter into his vehicle and leave the wash area only when the wash cycle is completely finished.

⚠ *It is forbidden to enter into the working area when the machine is in operation.*

4.4 PROTECTION DEVICES

4.4.1 ELECTRICAL DEVICES

4.4.1.1 Emergency stop buttons

The machine is equipped with at least two emergency push buttons, mushroom type (1). Pressing one of these buttons will immediately stop all machine movements.

When pressed, the button remains locked and must be manually released.

Position of the emergency buttons

1. remote control panel
2. self service payment system and/or additional pushbutton panel (if installed)
3. left side column of the drying gantry

Reset of the emergency button

Stop button on the gantry

Turn the button clockwise to unlock it.

Stop button on the remote control panel

Insert the key into the button head and turn it clockwise to unlock the button, then take out the key.

4.4.1.2 Cable-type safety switches

If, in indoor installations, the safety distance of cm 50 (19"3/4) as described in paragraph 4.2.2.2 is not available, it is compulsory to equip the machine with the relevant safety devices in order to grant a minimum, although acceptable, protection against accidents, in compliance with the norms.

Following technical solution has been adopted: the four corners of the mobile gantries (top view) are equipped with four switches controlled by steel cables which are running perpendicularly from the top to the bottom of the machine frame.

The switches are opened by voluntary pulling/pushing one of the cables, following an accidental contact with persons or obstacles or when a cable is loose or broken.

Opening of one of the switches is like pressing an emergency pushbutton, therefore a manual reset of the switch is necessary.

Reset of the safety switch

When the safety switch is activated, the pawl (1) is lowered by some millimetres and remains blocked in this position.

Check the correct position of the safety cable and its tension, it shall not be loose or too much stretched, then pull up the pawl until the internal switch is disengaged.

The technical data of the above mentioned safety switch is enclosed in the documentation supplied the user, under "safety components".

4.5 RESIDUAL RISKS

The Machine was designed with the aim to remove all hazards linked to its use.

During normal wash operation, maintenance and cleaning, the operators and sometimes the wash customers can undergo residual risks that can not be completely eliminated due to the kind of work they are carrying out.

Below are listed the residual risks or their origin, with a reference to the paragraphs of this manual where to find the relevant instructions and the related prevention and protection measures in order to control them successfully.

No.	Description	Par.
1	Ejection of high pressure liquids	4.5.1
2	Mechanical origin	4.5.2
3	Work place	4.5.3
4	Noise	4.5.4
5	Chemical hazard	4.5.5
6	Biological hazard	4.5.6
7	Electrocution	4.5.7
8	Ejection of gas under pressure	4.5.8
9	Contact with hot surfaces	4.5.9

! *It very important that the operators of the washing unit are informed about these risks and the related measures.*

4.5.1 EJECTION OF HIGH PRESSURE LIQUIDS

Cause

Necessary to wash the vehicles.

Prevention and protection measures

Do not enter the working area when the machine is in operation. Make sure that all energy supplies (power, water, compressed air) are interrupted before any intervention or maintenance work.

4.5.2 MECHANICAL ORIGIN

Dangers and hazards

1. Gantry
   - □ Collision with the moving gantry.
2. Brushes
   - □ Collision with the rotating and moving brushes.
   - □ Crushing caused by falling of the top brush following the breaking of the lifting system.
3. Top dryer
   - □ Crushing caused by falling of the top nozzle following the breaking of the lifting system.
4. Vehicle in motion
   - □ Collision against moving vehicles.
   - □ Crushing of the feet under the vehicles' wheels.

Prevention and protection measures

1. It is not allowed to remain inside the vehicle during the washing cycle.
   - □ It is compulsory to carry out the routine maintenance checks in order to prevent sudden breakage of the lifting systems (see chapter 7),
2. It is not allowed to cross the wash bay when the machine is in operation.

4.5.3 WORK PLACE

Dangers and hazards

1. Wet or humid floor.
   - □ Danger of slipping.
2. Contact with the rail or the underchassis wash (if installed).
   - □ Risk of stumbling.
3. Noise (see paragraph 4.5.4)
4. Wash chemicals (see chemical hazard, paragraph 4.5.5)
5. Recycled water (see biological hazard, paragraph 4.5.6)

Protection and prevention measures

1. Be careful when entering into the working area, only when the machine is not working or switched off, paying attention to the wet floor.
2. Move carefully inside the working area and pay attention not to stumble on components fitted on the bay floor.
3. Follow the instructions written in the safety boards fitted in the work place (see paragraph 4.6.2).

4.5.4 NOISE

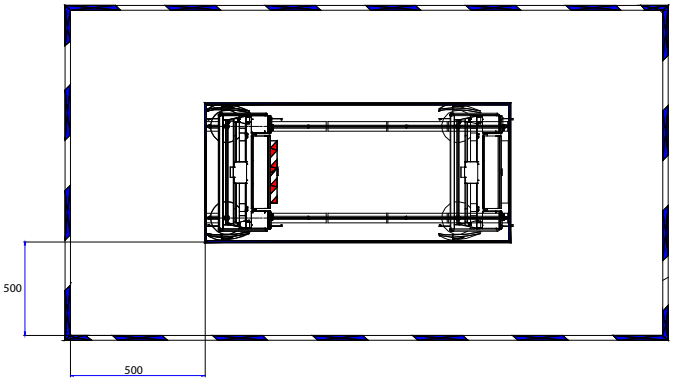
Cause

Drying cycle.

Prevention and protection measures

Keep a distance of at least 5 meter (16 ft) from the dryer's operation area. Wear a noise protection headset if necessary.

The operator shall instruct the wash customers to keep the same safety distance.



4.5.5 CHEMICAL HAZARD

Danger

1. Chemical products used for washing (irritations and/or intoxications due to direct or indirect contact with the skin or to ingestion).
   - □ Topping up or replacement of cans.
   - □ Wash chemical delivery during the wash cycle.

Prevention and protection measures

1. Wear protective gloves and goggles when dealing with wash chemicals; follow the instructions given in the technical cards of the products.
2. Machine operation should be avoided under strong wind conditions or if a powerful air blast can spread the wash chemicals outside of the working area.
3. The wash customers shall keep a distance of at least 5 meter from the working area and have a protection against direct air blasts.
4. All wash chemicals must be provided with the relevant technical documentation. The safety cards are very important as they supply all instructions for the correct use of the product and information on the toxicity level and on the first aid measures to be taken in case of contamination or ingestion.

! *The cards must be kept is a safe place and be always available for consultation.*

4.5.6 BIOLOGICAL HAZARD

Danger

1. Recycled water

   The water accumulated into the storage tanks for a long time and without addition of fresh water can be polluted by micro organisms.

Protection and prevention measures

1. It is recommended to discuss with the supplier of the water reclaim unit about the possible solutions and prevention measures.

⚠ *Do not use recycled water for other purposes, different from vehicles washing.*

4.5.7 ELECTROCUTION

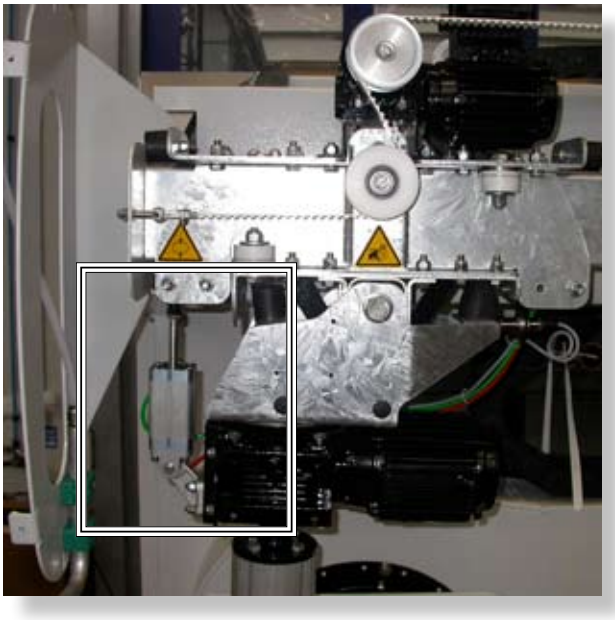
Cause

Presence of electric current in the connection boxes of the wiring system.

Prevention and protection measures

Do not carry out any work on live parts (note for the maintenance engineer).

4.5.8 EJECTION OF GAS UNDER PRESSURE



Origin / Cause

1. Air hoses
   - □ Disassembling of hoses for maintenance purposes.

Prevention and protection measures

The pneumatic cylinder for the adjustment of the side brushes inclination remain under pressure also when the machine is switched off and the compressed air supply line of the site is closed or disconnected.

Turn completely anticlockwise the knob of the air pressure regulator of the hydraulic-pneumatic panel, to discharge the pneumatic circuit, before disconnecting the cylinders feeding pipes.

4.5.9 CONTACT WITH HOT SURFACES

Dangers and hazards

1. Electric boiler (if installed) or its connection components.
   - □ Burning due to contact with hot surfaces. The boiler and the exit pipes may remain at hot temperature for a long time after the machine is switched off.

Prevention and protection measures

Wait until cooling down before carrying out any maintenance, or wear protective gloves.

4.6 WARNING SIGNS

The machine is equipped with warning stickers, signalling residual risks (see par 4.3), give instructions on how to behave and inform about the machine's operating limits.

Some of the stickers are fitted on specific support panels to be placed at the four corners of the working area (see par. 4.3).

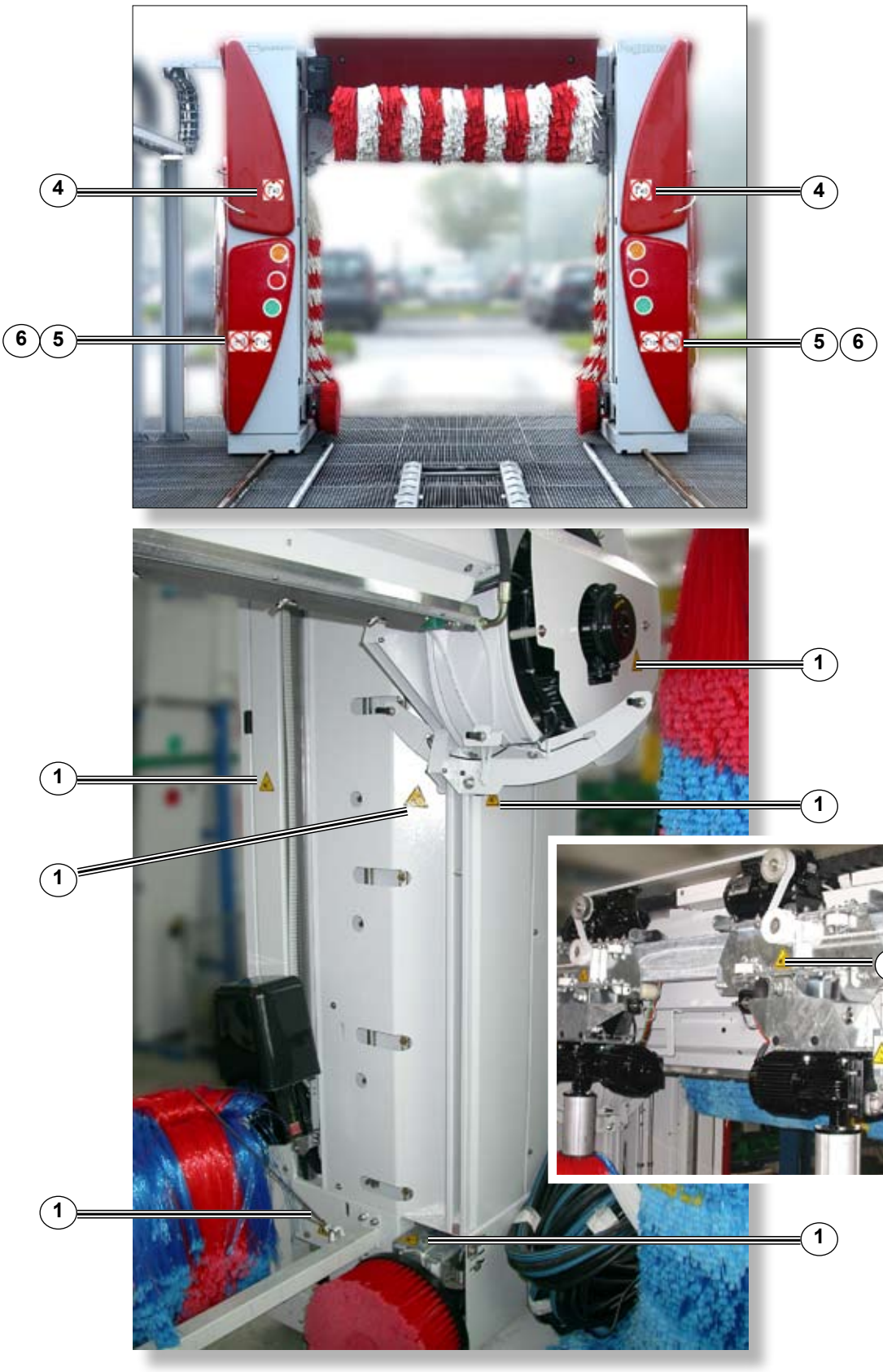
! *The stickers must be kept clean and shall be immediately replaced if they are detached or worn out.*

4.6.1 MACHINE DEDICATED WARNING SIGNS

1		**Danger of cuts, crushing**. Danger due to the rotors movement, to the rolling of the sliding wheels of the mobile bridge, the gearing belts.
2		**Danger of gas discharge**. Container with pressure also with machine off. Placed on the jackscrews for the inclination of the brushes.
3		**Danger of burnings**. Placed on the boiler, if present. Its surfaces can remain at high temperature also after the machine stop.
4		**Max height allowed of the vehicles under the gantry**. Prohibition to make higher vehicles enter (94"1/2)
5		**Max length allowed of the vehicles under the gantry**. Prohibition to make larger vehicles enter (82"3/4)
6		**Prohibition to stay on board of the vehicle** during the washing cycle.
7		**High voltage**. Before the intervention cut off the power supply. Sign placed on all containers of power equipments (electric board, connection boxes, motors).
8		**Hook-up points**. They indicate the anchoring positions to lift the machine. See chapter 5.

! *When the machine is installed in closed bays the stickers 4-5-6 should be placed also at the bay entry side and well visible for the vehicle's driver.*

4.6.1.1 Position of the stickers on the machine

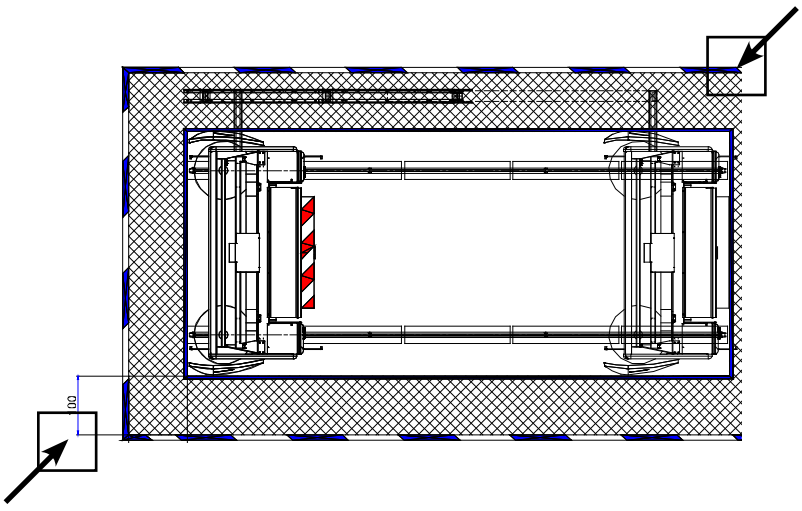


4.6.2 SIGNS IN THE WORKING AREA

1		**Danger of tripping/falling**. Do not cross the area marked, in particular during positioning and collection of the vehicle.
2		**Outsiders must not under any circumstances cross the area** marked by the yellow/ black band which is considered a “Danger Area” and/or stand in the area during washing. In particular avoid standing between the gantry, the tracks and the vehicle.
3		**Danger of slipping**. When getting into and out of the vehicle move with caution and pay attention to slippery areas.
4		**Danger of crushing**. Pay attention to moving parts.
5		**Danger of impact with fixed parts**. Keep a safe distance.
6		**Instructions for the user** (see par. 4.6.3)

4.6.2.1 Position of the stickers in the working area

The signs dedicated to the working area shall be attached on suitable support panels at the four corners of the wash bay.



4.6.3 INSTRUCTIONS FOR THE USER

Instructions about the correct use of the machine shall be placed by the site manager close to the remote control panel. An example of an instruction panel for the wash customers is shown below.

"SELF SERVICE" MOVING GANTRY WASHING UNIT FOR VEHICLES

OPENING HOURS_____

CONTROLS

Check that the dimensions of your vehicle are within the max allowed washing sizes:
max. height _____ m (in) max. width _____ m (in)

PROHIBITIONS

- It is forbidden to wash Jeeps.
- It is forbidden to wash pick-ups (only for Hydrus Air Plus).
- It is forbidden to wash vehicles with protruding spare wheel.
- It is forbidden to wash vehicles with marked spoiler.
- It is forbidden to stay on board of the vehicle during the washing cycle
- It is forbidden to enter or stay in the operating area during the washing cycle

INSTRUCTIONS FOR USE

- Close the windows.
- Make sure the rear-view mirrors are folded close to the bodywork.
- Remove radio aerial.
- It is forbidden to leave roof racks, ski racks and/or bike racks on the vehicle.
- Drive the vehicle inside the washing unit.
- Drive slowly and stop when the "stop" sign on the traffic light switches on (where installed) or place the vehicle wheel into the start board.
- Pull the hand brake.
- Insert the wash card into the card reader.

Alternatives

- Insert the electronic key or he magnetic card in the payment station and select the required wash program.
- Insert the notes in the banknote reader and select the required wash program.
- Digit the pin code in the specific keyboard.

In case of emergency push the red STOP button placed on the control panel or on the _____ side of the washing unit.

!

The site management declines any liability for damages to persons or goods caused by the non compliance with above instructions

4.7 SAFETY AND CONTROL DEVICES OF THE MACHINE

4.7.1 ANTI COLLISION DEVICES

4.7.1.1 Anti collision bars

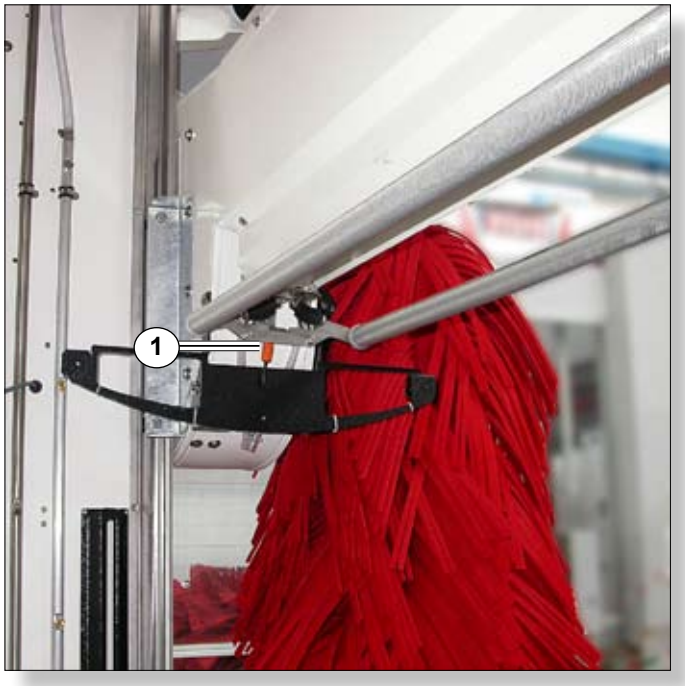
The top dryer is equipped with an anti collision system. The device includes two longitudinal bars lined with spongy material.

Both ends of each bar are connected to an oscillating system equipped with an electronic sensor (1). In case of collision or hooking of one bar with an obstacle in any direction, the two sensors will be activated and a special sequence of operation of the machine will be switched on.

The correct operation of the sensors is automatically controlled at the beginning of the drying cycle. If one of the sensors is out of order, the operation of the machine will stop.

The linings of the bars can rotate free of on the tubes and this will make unhooking from obstacles easier.

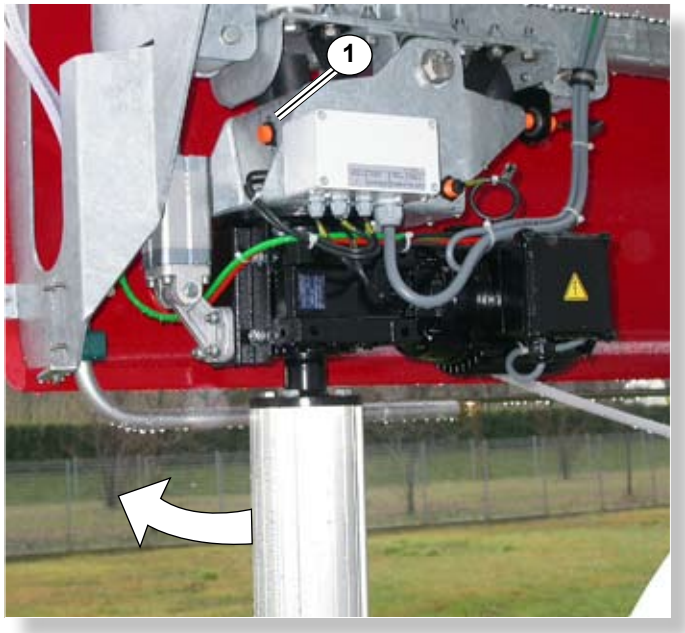
See chapter 7 for further details.



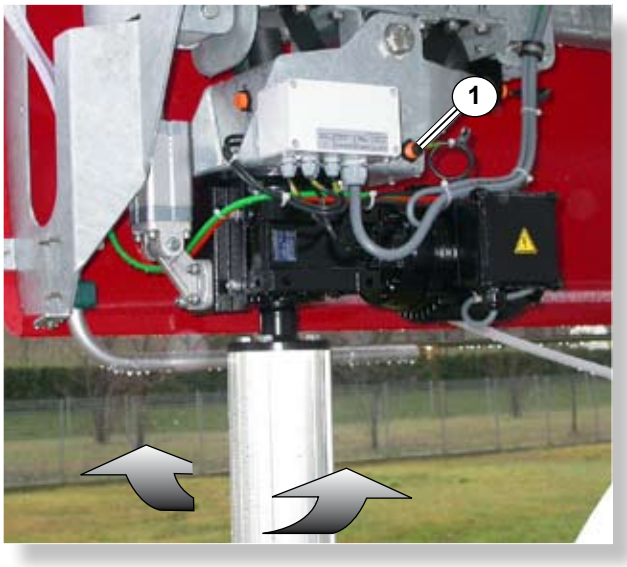
4.7.1.2 Control of side tilting of the vertical brush

If the vertical brush, because of an obstacle, is tilted laterally towards the outside beyond the allowed angle, the sensor (1) will be activated and a special sequence of operation of the machine will be switched on (see chapter 6). Each vertical brush is equipped with a control device.

It is likely that at the same time or a moment before, the power control system will measure an anomalous absorption of the motor (see point 4.7.4.2)



4.7.1.3 Control of longitudinal tilting of the vertical brushes



If the vertical brush, because of an obstacle, is tilted longitudinally beyond the allowed angle, the sensor (1) or the opposite one will be activated, depending on the direction of inclination. This will switch o a special sequence of operation of the machine (see chapter 6).

Each vertical brush is equipped with a control sensor.

It is likely that at the same time or a moment before, the power control system will measure an anomalous absorption of the motor (see point 4.7.4.2)

4.7.2 ANTI BREAKAGE DEVICES

4.7.2.1 System to control the belt breakage

The lifting systems of the top dryer and of the top brush are controlled, during their operation, by following working parameters:

- frequency control of the driving motor
- control of the belt movement on the idle pulley by means of sensor.

In case of rupture of the belt, the imbalance of the system will cause the emergency stop of the machine.

The control system will be activated also in case of an unexpected mechanical block of the up and down movements of the groups.

4.7.2.2 Control of the external temperature – Frost protection (option)

In order to avoid that too low ambient temperature can cause damages to the hydraulic system, the ma-chine can be equipped with a optional device for the automatic discharge of the circuit. The device is equipped with a temperature probe, placed inside the left gantry column in the point (1) indicated in the figure.

When the temperature drops to a pre-set value (normally 0°C), following actions are started:

- □ the operation of the machine is interrupted after the completion of the wash cycle under way and the digital text display, if installed, indicates that the machine is out of service due to low temperature

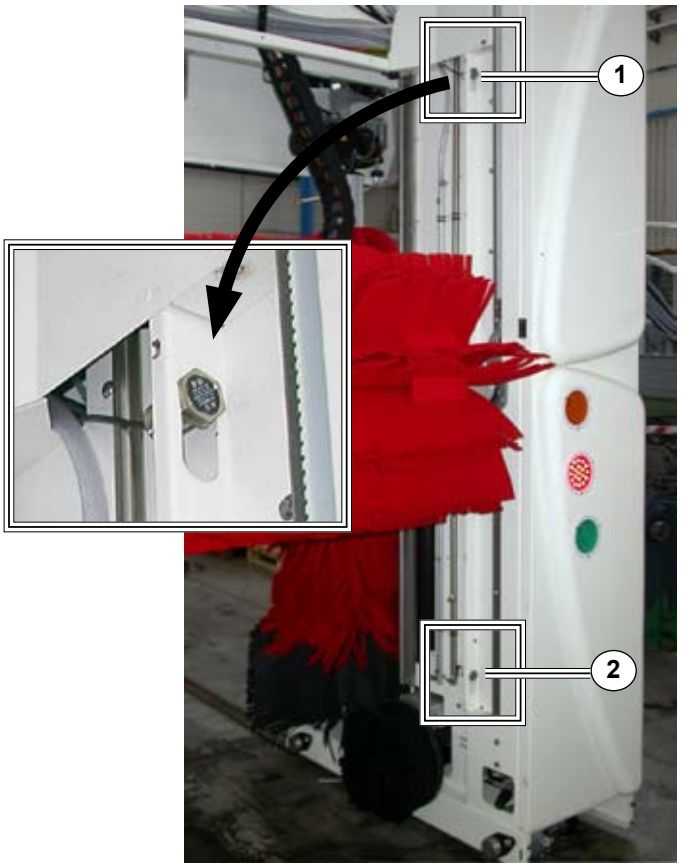
- the hydraulic circuit is automatically discharged.

When the temperature rises again, the machine will be immediately operational and will automatically fill the hydraulic circuits before starting the first washing cycle

4.7.3 LIMIT SWITCHES

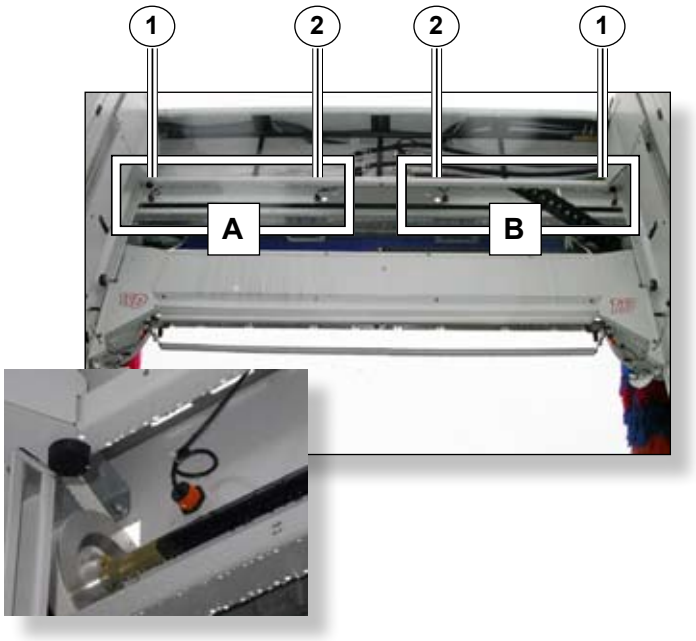
4.7.3.1 Top brush travel limit switches

1. Brush bottom sensor
2. Brush top sensor



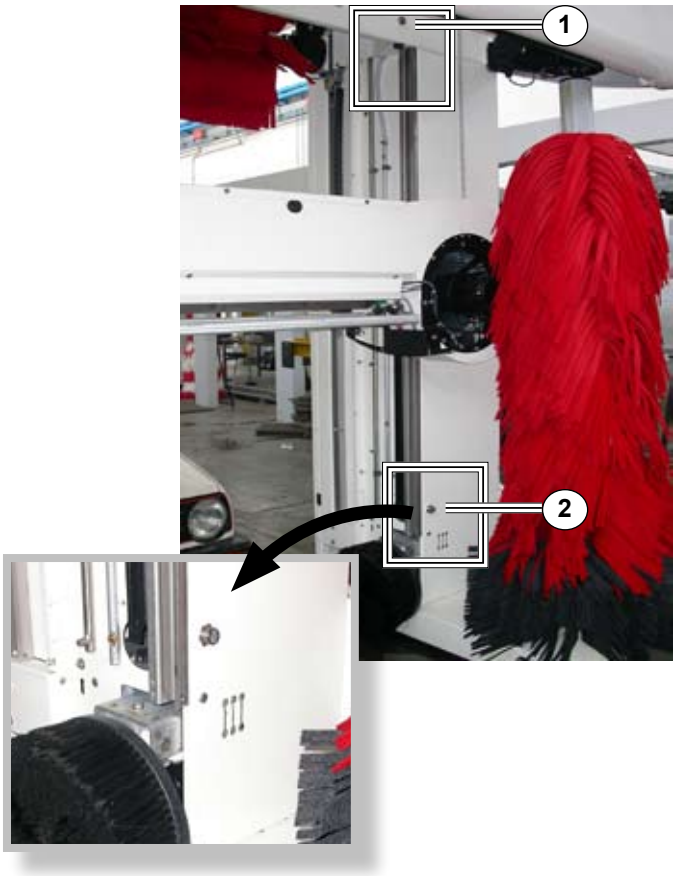
4.7.3.2 Side brushes travel limit switches

A. Left brush sensors
B. Right brush sensors
1. Maximum opening sensor
2. Maximum closing sensor



4.7.3.3 Top dryer travel limit switches

1. Drying nozze top sensor
2. Drying nozze bottom sensor



4.7.3.4 Gantry travel limit switches

1. Gantry backward sensor
2. Gantry forward sensor

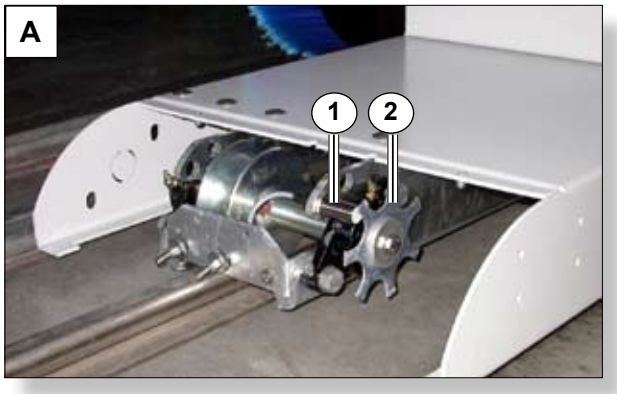
4.7.4 ELECTRONIC SYSTEMS

4.7.4.1 “Clock” control

The position of all mobile groups is checked by counting the number of “clock” signals which are regularly sent by the suitable devices fitted on the relevant groups during their travel.

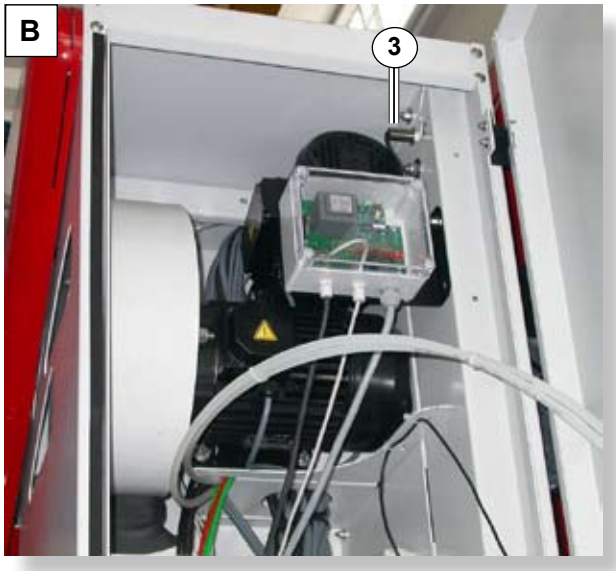
Gantry travel

The picture (A) shows the “clock” system fitted to the left side idle running wheel of the gantry. The device includes a sensor (1) and the shaped activation wheel (2). One clock signal corresponds to a movement of the mobile gantry of approximately 2 cm (3/4”)



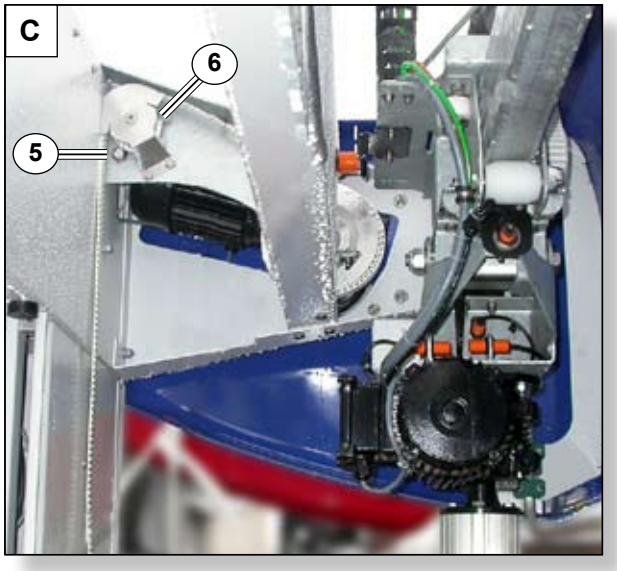
Top brush travel

The picture (B) shows the “clock” system fitted to top brush lifting group, includine the sensor (3). The shaped activation wheel is fitted outside of the column.



Top dryer travel

The picture (C) shows the “clock” system fitted to the top drying nozzle unit. The device includes a sensor (5) and the shaped activation wheel (6).



4.7.4.2 Power absorption control

The power absorption of the motors is constantly checked during the rotation of the brushes. If the value exceeds an established threshold value, the control system will immediately stop the machine. All working groups, with the exception of that one interested by the excessive power absorption, will move to the safety position (maximum opening and height). If the cause of the block was due to an hooking of the bristles with an appendix of the vehicle, this safety operation will avoid damages to the brushes and the vehicle.

See chapter 6 for instructions about reset of the normal working conditions.

CHAPTER 5

Transport and installation

5.1 WARNINGS

5.1.1 GENERAL NOTES

- The operations of unloading, lifting and handling of the washing unit shall be carried out by specialised personnel under the responsibility of a supervisor.
- The persons in charge shall wear individual protection devices in connection with the work to be carried out and must use suitable lifting equipment and tools.
- Installation of the machine is carried out by personnel of the Manufacturer or by an authorised Service Organisation. The Manufacturer will not accept any liability if the machine is installed by non authorised persons.

From now on the word "cable" is used in general to define also other means, such as chains, ropes or belts.

5.1.2 LIFTING INSTRUCTIONS

- The load capacity of all lifting and handling equipment shall comply with the weight of the parts to be lifted. Weights are indicated on the packing or/and given in chapter 3 of this handbook.
- Make sure the lifting cables comply with the norms in force, are provided with the label in which all data of the manufacturer are indicated and that the load capacity is well known.
- Check the lifting cables before using them: they should not be damaged nor have broken wires or wear and tear signs.
- Do not twist nor tie the cables and follow the instructions for use indicated by the manufacturer.
- Non authorised persons are not allowed for to enter the handling and transport area.
- Before lifting, check that the working area is empty and with enough «escape space», in other words, a free and safe area, where it is possible to move quickly away in case the load falls down.
- Empty and mark the transfer area;
- Check the completeness and suitability of the available means;
- Do not touch the suspended loads and stay at safety distance;
- During transportation, the loads shall not be lifted for more than 20 cm (8") from the ground.
- The platform where the machine has to be loaded shall be perfectly even to avoid possible load's movements.
- Fasten the machine to the truck loading platform, using cables or chains well stretched to block any possible movement.
- After the transport and before freeing the machine from all fastenings, check that the state and the position of the machine are not dangerous.
- After unloading the machine and its accessories, place them in a safe location and go on with the unpacking and installation operations

5.1.3 HOW TO STORE THE MACHINE

- It is strictly forbidden to put the boxes one above the other.
- If the boxes are left outside for some time waiting for installation, cover them with large plastic sheets.
- If the boxes have to remain stored for more than 3 months, keep them in a space protected from weather agents and from too high or to low temperatures.
- Check the following when selecting the equipment storage place:
  - □ Environmental conditions:

    Temperature: from -5°C to 45°C (23°F to 113°F)

    Maximum humidity: 60%

- Make sure that the stored parts can not be hit accidentally or hinder the movements of the regular material handling equipment of the site.

5.1.4 UNPACKING INSTRUCTIONS

- Unpacking and installation must be carried out by specialised personnel of the Manufacturer or by an authorised Service Workshop.
- Cut the metal straps with care since they can jump to the face or the hands of the person cutting them.
- Do not leave around parts of straps.
- Start unpacking by taking out the nails of the upper lid of the box and go on taking out the nails of the side panels.
- All the materials used to pack the unit are environment friendly and shall be disposed of in compliance with the local norms and taking all measures to protect the environment.

5.2 LIFTING AND TRANSPORT

5.2.1 INFORMATION ABOUT THE PACKING

The machine can be shipped either completely assembled or partially disassembled.

Shipment of the assembled machine can be carried out in different ways:

1. fastening of the gantry to the loading platform of the truck
2. machine packed in crates
3. container packing

The machine or its disassembled parts packed in crates or container, are protected with plastic sheets.

5.2.1.1 Shipping instructions on the machine

On the machine there will be a card supplying following information by means of drawings:

- Number of packing (packing list)
- Suitable lifting equipment
- Anchoring points
- Type of anchoring
- Weight
- Where to find the user manual (in five languages, or symbols).

If the machine is delivered in a crate or shipping container, the instructions will be attached to the opening side of the container.

5.2.1.2 Shipping instructions on the packing

On all packing, or shipping container, there will be a card supplying all or some of following instructions:

- Anchoring points
- Type of anchoring
- Centre of gravity
- Weight (net, tare, gross)
- Crate dimensions
- How to open the case (first side to open, with help of drawings or description)
- Storage instructions and suggestions (ex., do not stack)

The above supplied information can be useful if the machine, after the first installation, is going to be removed, packed and shipped to another site. To this purpose you will find in chapter 8 the original cards to be photocopied and attached to the machine,

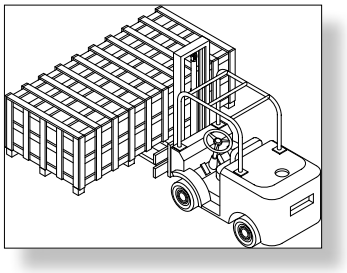
crate or container. It is important to protect the cards against atmospheric agents, though plasticizing or by inserting them into plastic envelopes (be careful to turn the open side towards the bottom).

Before transporting the unit completely assembled, the machine must be prepared in order to avoid mechanical damages during transportation, as described in paragraph 5.3.

5.2.2 PICTOGRAMS ON THE PACKINGS

	Top side	Keep the top side of the packing as indicated by the arrows
	Fragile	Handle with care
	CE marking	Machine in compliance with safety requirements.
	Centre of gravity	Centre of gravity to be considered for lifting.
	Anchoring	Points where to anchor the lifting ropes or chains.

5.2.3 CRATED MACHINES



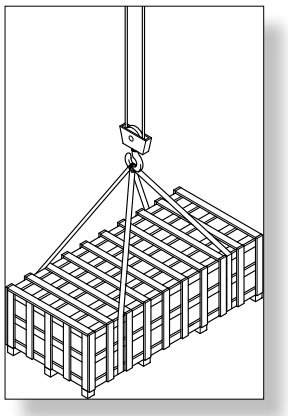
5.2.3.1 Use of the truck lift

Use a fork truck lift with suitable load capacity and with features that are compatible with the bulk and the volume of the load.

The forks must come out from the entry opposite side for at least 20 cm (8”).

Lift lightly the crate to check that the machine is well balanced.

Drive the truck lift vehicle with care and, when possible, lower the load as close as possible to the floor.



5.2.3.2 Use of the crane or bridge crane

Make sure the load capacity of the crane and the lifting cables are compatible with the operations to carry out.

Introduce the cables under the crate, keeping them at a proper distance. Lift the box lightly to check that the load is well balanced and, if necessary, re-position the cables.

5.2.4 UNPACKED MACHINE

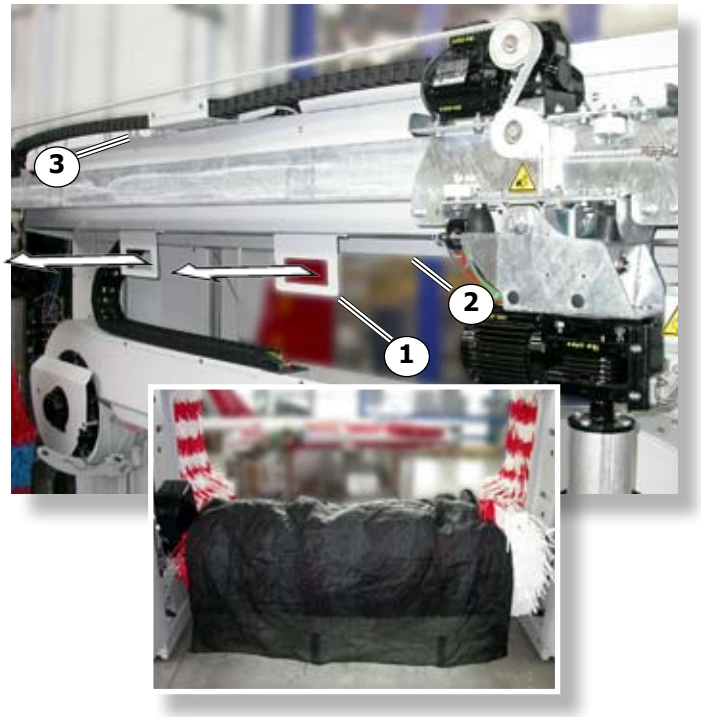
5.2.4.1 Equipment and tools needed for lifting and handling

- Crane with suitable lifting capacity.
  - □ Pair of sturdy lifting eyelets, with suitable capacity.
  - □ Pair of certified lifting ropes, with suitable capacity and length (lifting procedure is described in the next paragraph).

or

- Truck lift with suitable capacity
- Fork lift and/or trans-pallet to move the accessories on the floor.

5.2.4.2 Use of the fork truck lift



Top brush side

Move the truck slowly, making the forks pass under the bearing bar (2) and infilale in the brackets (1) making sure they come out for at least 10 cm. The machine's barycentre is precisely under the bar (2); the brackets (1) should center the forks and make sure that the load does not wave. Please remind to keep the top brush covered to prevent the brushes to get dirty by the lubricant regularly spilled along the side sliding runners of the vehicle.

! *Lift the load and go forward with the vehicle softly*

Rear side (side brushes)

If the machine is placed in a complicated way and it is necessary to lift the machine from the side of the side brushes, remove the carter covering the drive as described in the following paragraph. Once removed the carter insert the forche in the brackets (1) untill the bearing bar is overcome by at least 20cm (8") (2).

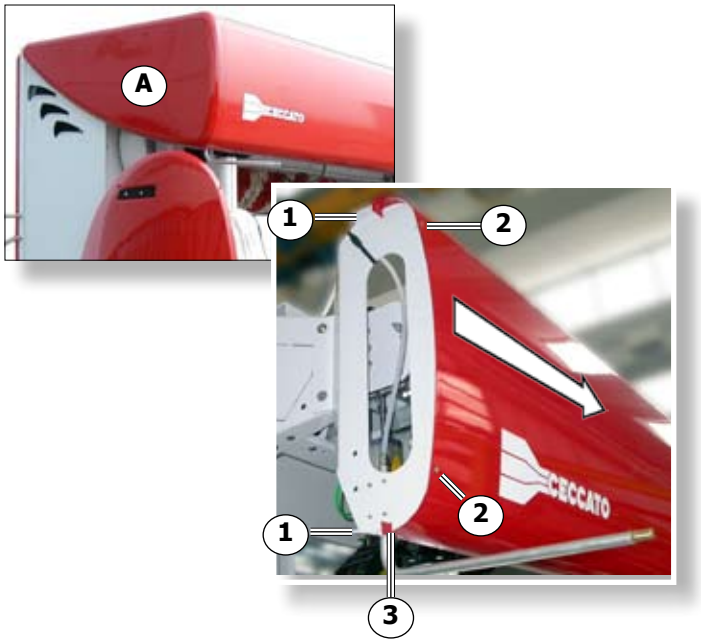
! *After positioning the machine in the final destination area, collect and keep all the tools used for the lifting and transport of the unit for future needs.*

5.2.4.3 Components remove

To reach the brackets where the forks have to be inserted it can be necessary to remove the front carter as described as follows. This operation has to be carried out by two persons.

Procedure:

- Remove the side lids (A) unscrewing the screws from the appendixes (1).
- Take out the four screws (2), fastening the front carter (two screws on the right and two screws on the left).
- Make the carter step back to go out from the runners (3) and then slip it off completely.



5.2.4.4 Use of the crane or bridge crane

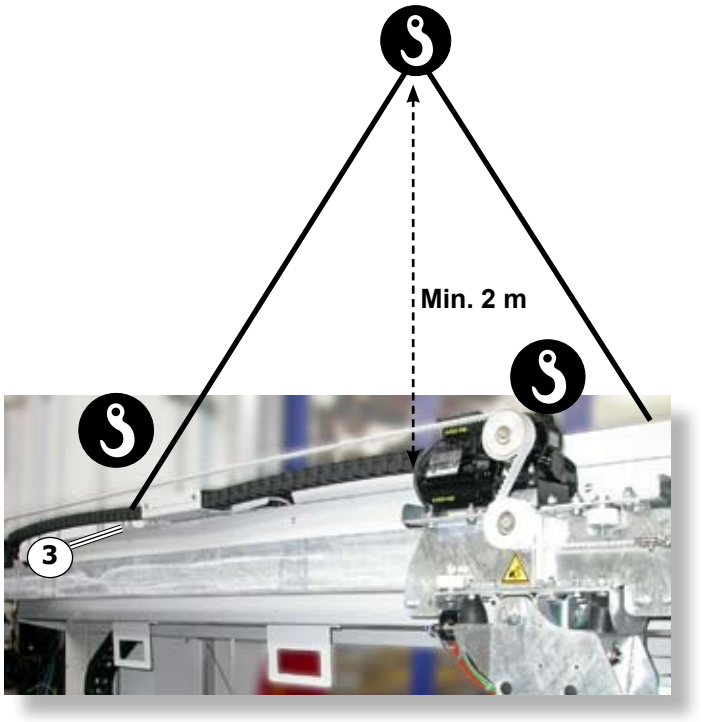
Make sure the load capacity of the crane and the lifting cables are compatible with the operations to carry out.

If there is no crane beam, the cables shall be long enough as to guarantee a lifting triangle height of at least 2 meters (80”).

Hook up the cables to the two rings (3) and lift carefully.

! *Avoid any oscillation of the load during transportation.*

When the machine is correctly positioned on its installation place, the lifting brackets can be fixed under their support base, inside the cross beam, in reversed position.

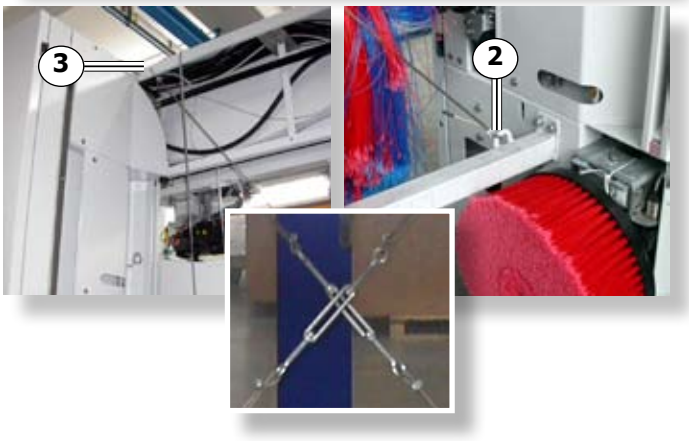


5.3 PREPARATION FOR THE TRANSPORT

5.3.1 MECHANICAL PREPARATION

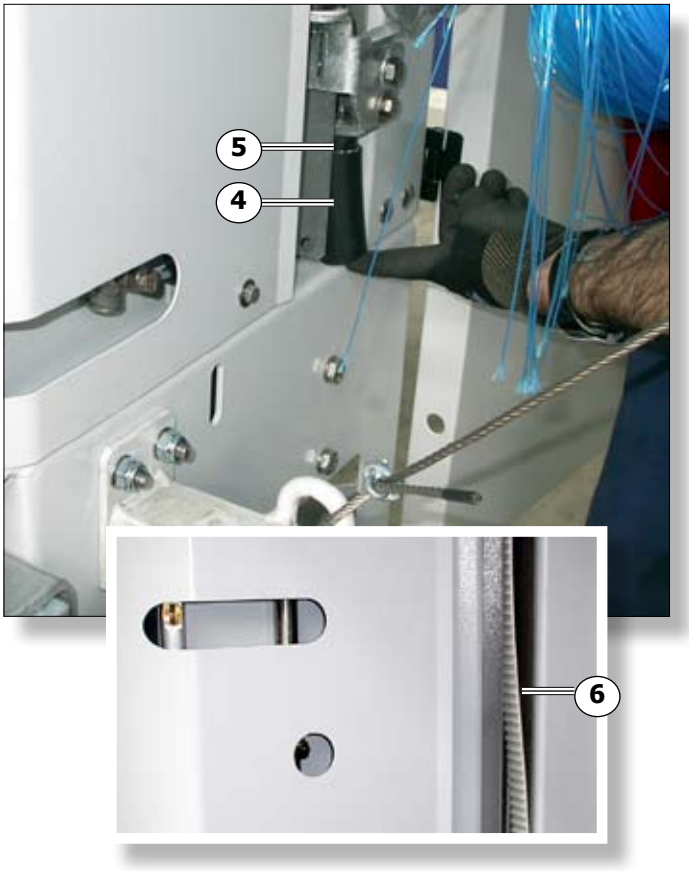
If the machine has to be transported completely assembled, it is necessary to carry out some operations to avoid mechanical damages during lifting and transport.

- Lower completely the top brush.
- Lower the mobile bridge as shown in the picture.
- Switch off the machine and cut off all the power supplies and external accessories.
- Fasten the connection bar (1) to the columns feet.
- Stiffen the gantry frame connecting the hook point on the two diagonals with steel cables (2-3).



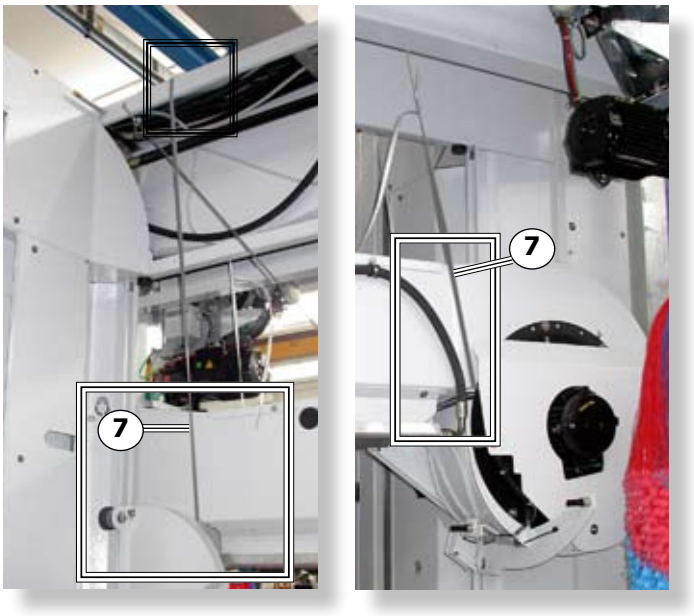
- Stretch the cables adjusting the tie rods in the middle.

- Lift a side of the top brush and insert a piece of rubber pipe (4) on the shock absorber (5); this will cushion the brush weight during transportation. Rubber pipe inside diameter 30 mm (1”$^{1/4}$), length 80 mm (3”).
- Go on in the same way on the other side of the top brush using a longer pipe (1-2 cm - 1/2”-3/4”) to cope with the weight of the motor gear.



- Once this operation is finished, the lifting toothed belts (6) must be loose.

- Block the top dryer with cables or plastic straps (7), passing them over the top cross beam of the gantry as shown in the pictures.



5.3.2 FASTENING ON THE LOADING PLATFORM

Place the gantry on the loading platform of the means of transport, inserting the wheels on the specially shaped wood pieces.

Nail the shaped wood pieces on the loading platform of the means of transport.

Block the machine with cables, passing them over the gantry's top cross beam.

5.4 INSTALLATION

!

- *The installation operations, connections and first machine start up are to be carried out by specialised and authorised personnel of the Manufacturer*
- *After positioning the machine in the final destination area, collect and keep all the tools used for the lifting and transport of the unit for future needs.The brackets for the forks are to be removed while the ones for the lift with cables can be fastened in the opposite way under their support base inside the bar.*

5.4.1 ENERGY SOURCES

The machine shall now be connected to the necessary energy sources:

1. electric power
2. pneumatic system
3. water system

Consult chapter 3, par. 3.5.1 to see the connections technical specification.

The water and compressed air connection points in the machine are not equipped with cut-off devices; these must be installed by the user in the distribution systems of the site.

5.4.2 POWER SUPPLY CONNECTION

- Connection of the washing unit power supply system must be prepared by the User, under his responsibility and in compliance with the safety norms and with the local prescriptions.
- The User is responsible for the protection of the power supply cables against overcharge and short circuit and for the connection of the circuits to a reliable earth system.
- The installation engineer carrying out the power connections shall have the specific technical-professional requirements.
- A «conformity declaration» of the electrical system must be issued by the installation engineer and left with the site manager.
- Use a cable according to the norms and with the section required by the installed power to connect the washing unit to the power supply line. Installed power and number of poles are given in the machine data plate.

- Consider also the environmental conditions, the installation place and the distance when choosing the cable type.
- Check that the power supply line is powered off before connecting the washing unit.
- Make sure that the power cable is well secured and protected from damages due to accidental contacts.

5.4.2.1 Procedure

! *Following information are intended exclusively for the engineer responsible of the machine connection.*

The point of connection of the machine power supply is inside the electric box which is part of the cables and pipes support system (see detail on the picture).

All necessary cable glands, including the one for the power supply cable, are already fitted to the connection box.

Inside the box there is a terminal strip with extension terminals of different size for the electric connection of the services and five large dimension terminals for the connection of the mains.

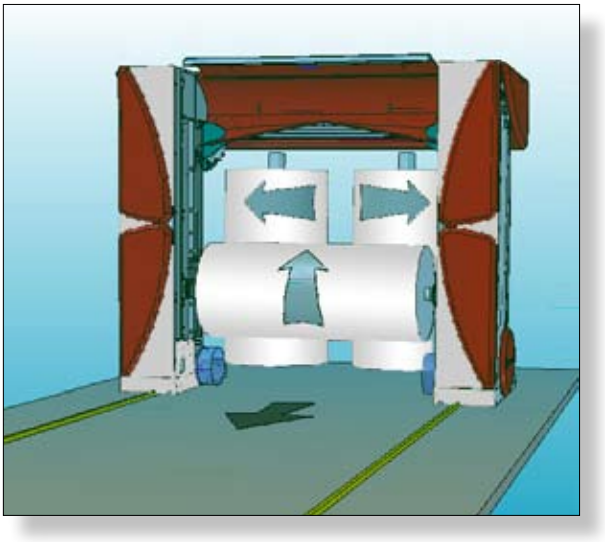
All terminals are equipped with spring-type clamps to secure the wire ends. To connect the wires, insert the tip of a screwdriver into the opening as shown in the picture and use it as a lever to overcome the resistance of the internal spring and open the passage for the wire connection.

After inserting the wire, take out the tip of the screwdriver.

Five terminals are normally installed, three for the connection of the phases (L1-L2-L3), one for the neutral conductor (N) and one for protection circuit (PE).

5.4.3 CHECKS AND SETTING

5.4.3.1 Checking the phases



Motors on board of the machine

- Switch on the machine following the instructions given in chapter 6.
- Check the correct rotation direction of the electric motors on the machine .Make reference to those without INVERTER control, such as the brush rotation motors (see picture at the side, forward rotation); if the rotation is wrong, reverse the phases in the main connection terminal board of the unit.

If the rotation direction is wrong, reverse the phases in the junction box of the relevant motor.Proceed as indicated below if the motors rotation is not coherent with the control:

- Switch the machine into safety condition (electric system only, see chapter 7 par. 7.4).
- Reverse two out of the three supply phases in the electric cabinet (L1-L2-L3).
- Switch on the machine again and check the rotation.

Motors of ancillary equipment

Check the correct rotation of the pumps; if the direction is wrong, change the phases of the single motor.

CHAPTER 6

How to use the machine

6.1 GENERAL INFORMATION

In this chapter you will find all the necessary instructions to operate the washing unit HYDRUS in all possible working modalities. We assume that the unit is now correctly installed and ready to be used, with washing programs already customized and provided with the proper chemical products.

To change the washing programs refer to the enclosed programming handbook.

Consult chapter 3 of this handbook to get acquainted with the function of all devices.

6.2 INSTRUCTIONS FOR START UP OF THE MACHINE

6.2.1 MANUAL OPERATION

The User and Site Manager shall follow the instructions given in this chapter if the washing unit is operated in manual mode.

6.2.2 SELF-SERVICE MODE

If the washing unit is operated in self-service mode, the User is responsible for the installation of all necessary instruction panels and signs informing the wash customers about use, controls, prohibitions and precautions to be taken when using the machine.

6.2.3 DAILY CONTROLS

- Before starting up the machine clean the unit and the floor, in particular the area around the rails. No obstacle or foreign body shall be left on the wash bay floor since it can cause damages to the unit.
- Make sure there are no foreign bodies in the brushes, included the wheel washers, check as well the state and the fastening of the brush elements on the shafts.
- Clean the warning signs placed on the unit so that they are well readable.
- Check the level of the chemical products in the relevant cans, top them up if necessary.
- Clean the heads of all photocells using a soft cloth.
- Check the operation of the emergency stop button.
- Check the availability of power, water and compressed air.
- Release the condensation water from the compressor.

- Check that the gantries are in regular starting position.

6.2.4 PRECAUTIONS

The operator shall proceed with the starting up of the machine only if:

- He has read and understood the handbook, especially the safety instructions of chapter 4;
- He has checked that the machine is in good working order, lubricant oil and wash chemical levels are correct and all parts subjected to wear are in good conditions;
- He has checked that there are no persons, children, animals or other obstacles within the operating area. The gantries running area is to be considered as “dangerous zone” and off limits for persons not in charge of the washing unit operation;
- He has checked the perfect condition and operation of all safety devices (see chapter 4 and paragraph 6.4 of this chapter).

6.2.5 PROHIBITIONS

- It is forbidden to wash the vehicle with people on animals on board. After positioning and stopping the vehicle with the stand-by brake, the driver must come out of the vehicle and move to the waiting area (see par. 6.2).
- It is forbidden to operate the machine with bare feet, by rain or stormy weather;
- It is forbidden to use the machine when parts are disassembled;
- It is forbidden to wash vehicles which size exceeds the allowed one, given in chapter 3.
- It is forbidden to use the machine after fitting of electric bridges and/or mechanical devices which are excluding some functions or groups of the washing unit.
- Untrained personnel or persons who are physically or mentally unfit are not allowed to use the machine.
- It is forbidden to approach and touch the moving parts or go in between the gantries.

6.2.6 ATTENTION DURING MACHINE OPERATION

- The washing unit and its operation area shall be constantly kept under surveillance by the operator of the machine. First of all it must be avoided that non authorized persons or animals can come close to the dangerous area.

  The washing unit operator shall remain close to the machine control panel, for immediate intervention in case of danger.

6.2.7 CONTROLS AND PRECAUTIONS AT THE END OF THE WORKING SHIFT

- Check that the warning signs and the instruction panels on the machine and in the wash bay are properly installed and not damaged.
- When carrying out adjustment, maintenance and cleaning operations, use the suitable individual protection devices (i.e. goggles, helm, gloves, safety shoes etc.).
- At the end of the working shift, if the machine is not going to be switched to self-service operation, cut off all energy supplies (machine safety condition, see paragraph 7.4 chapter 7).

6.2.8 INFORMATION ON WASH CHEMICALS

- The washing unit “HYDRUS” has been designed to be operated with chemical products recommended and provided by the Manufacturer. The use of other cleansers or chemical substances may affect the performance and the safety of the unit.
- The quality of the chemical product may affect not only the wash and drying quality but also the lifetime of the whole pumps and injection system. Low quality products may damage the pumps and the gaskets of the chemicals suction and delivery valves.
- Checking that the product cans are full, must be carried out in the morning, before starting the unit.
- Replace the wash chemical if it was not completely used or topped up for a month, since the product itself, especially the wax, slowly looses its characteristics in contact with the air.
- Clean the suction filters when an empty product can is replaced with a full one.
- Top up the can before emptying completely the relevant dosing pump. The dry operation may damage the pump’s membrane.
- The foam may leave halos or colour marks (if coloured) when it is left for a long time in contact with the vehicle’s surface. This effect can be even worse on canvas or other porous materials. It must be therefore avoided to leave the foam drying on the vehicle; if the wash cycle needs to be interrupted, remove the foam manually using plenty of water.

- Wear gloves and protective goggles when dealing with wash chemicals. Follow the instructions written on the chemicals safety cards, as they give all information on the correct use of the product, on the toxicity level and on the first aid measures in case of contamination or ingestion.
- Water and wash chemicals shall be used only for the normal operation of the machine. No other use is allowed.

6.3 VEHICLES WASH – PRELIMINARY CONTROLS

6.3.1 GENERAL INFORMATION

6.3.1.1 Vehicles' size

The dimensions of the vehicles to be washed must not exceed those indicated in the section 3 of this manual

6.3.1.2 Correct position of the vehicle

The correct position of the vehicle for the washing cycle is to be parallel to the rails and at the centre of the washing bay.

6.3.2 FURTHER CONSIDERATIONS

In order to ensure the regular operation and efficiency of the washing unit, check that the vehicle has no defects or features that may damage the washing unit and the vehicle itself.

Therefore please pay attention to and avoid washing vehicles with:

A. Protuberances of the bodywork that can push only on small sections of the brushes;

B. Excessive downward recesses and too marked spoilers – more than 15 cm (6")

C. Too much protruding – more than 15 cm (6")– and/or badly fixed roof racks;

D. Boats racks;

E. Ski racks and bikes racks;

F. Other over assemblage (taxi signs, rotating headlights, etc.);

G. Any aerial, except from the short and elastic ones;

H. Too much protruding external rear-view mirrors or additional headlights;

I. Windscreen wipers worn out or in bad mechanical conditions;

J. Metal profiles or other ornaments placed imperfectly on the bodywork;

K. Loose or too much protruding handles;

L. Undercarriage ledges or vehicles with lower trim.

! *Vehicles with cloth sliding roof or soft material roof shall be washed using the "van" modality (see programming handbook for further details). Nevertheless, these types of vehicles may be damaged and in such cases the Manufacturer will not accept any liability.*

6.3.3 INSTRUCTIONS FOR THE SITE MANAGER

1. The boat and ski racks should be normally taken off; they do not allow a good washing and in several cases they can hinder the regular operation of the unit. Nevertheless, thanks to the softness of the washing operations, if these devices are well fastened, are not multiple nor too close to each other, they can remain in place. The machine operator shall decide each time according to its experience. It is important to watch the drying phase.
2. The telescope aerials shall be lowered, other aerials folded back or fastened (for ex. with adhesive band) to the vehicle's bodywork.
3. If the rear-view mirrors and the headlights are well fastened they may not be damaged.
4. The windscreen wipers shall be easily pressed against the windscreen through suckers, adhesive band or protected by sheaths; pay attention to the cars with too curved windscreen (generally sport cars), to the vehicles with single or too big windscreen wipers, as well as windscreen wipers with levers, arms or other components protruding from the windscreen which may be caught by the brushes. To avoid this, the operator shall learn quickly to recognise vehicles and situations which may be dangerous, shall consolidate or protect, fixing them in vertical position. In any case it must be avoided that the windscreen wipers are lifted, if necessary take them out, as it is really simple to do.
5. Where possible, the loose metal profiles shall be fastened, for example with adhesive band.
6. Protect (also with adhesive band), the loose handles.
7. The wheels washer may be activated in the wrong position by too low vehicles and damage the bodywork: press the wheel wash exclusion button at the beginning of the cycle (see multifunction pushbutton, par. 6.5.3).

6.3.4 INSTRUCTION PANEL FOR THE WASH CUSTOMER

Instructions about the correct use of the machine shall be placed by the site manager close to the remote control panel. An example of an instruction panel for the wash customers is shown below.

"SELF SERVICE" MOVING GANTRY WASHING UNIT FOR VEHICLES

OPENING HOUR_____

CONTROLS

Check that your vehicle fulfills the max washing sizes:
max. height _____ m (in) max. wideness _____ m (in)

PROHIBITIONS

- It is forbidden to wash Jeeps.
- It is forbidden to wash pick-ups (only for Hydrus Air Plus).
- It is forbidden to wash vehicles with protruding spare wheel.
- It is forbidden to wash vehicles with marked spoiler.
- It is forbidden to stay on board of the vehicle during the washing cycle
- It is forbidden to enter or stay in the operating area during the washing cycle

USE INSTRUCTION

- Close the windows.
- Make sure the rear-view mirrors are folded close to the bodywork.
- Remove radio aerial.
- It is forbidden to leave roof rack, ski rack and/or bike rack on the vehicle.
- Drive the vehicle inside the washing unit.
- Drive slowly and stop when the "stop" sign on the traffic light switches on (where installed) or place the vehicle wheel into the start board.
- Set the hand brake.
- Insert the card in the control panel.

Alternative

- Insert the specific electronic key or he magnet card in the control panel and select the desired washing program.
- Insert the notes in the taker and select the desired washing program.
- Digit the code in the specific keyboard.
- In case of emergency set the specific red cap button place on the control panel or on the _____ side of the washing unit.

!

The managing staff declines any liability for damages to persons or things caused by the missed compliance with the above instructions

6.4 OPERATION MODES

Control post

The operator's control post is outside the working zone, which is marked on the floor by the yellow and black bands, in front of the remote control panel.

From the control post position, the operator shall be able to supervise the whole machine through all phases of the cycle in order to intervene quickly by any need or emergency situation.

Number of operators

The machine was designed to be used only by one duly trained adult operator (self service operation excluded).

Working area

The machine operation zone is defined as "working area" (dangerous area)

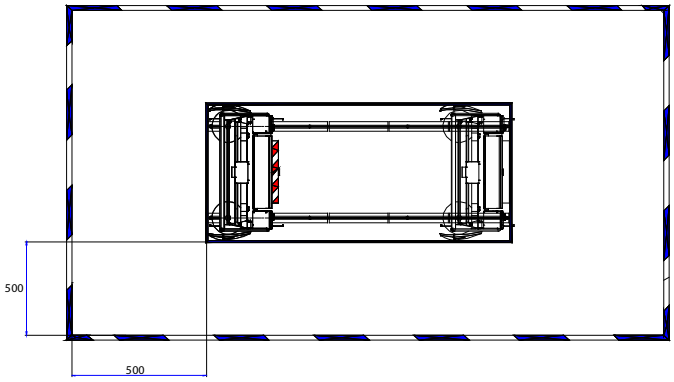
In this area, the operator in charge of the washing unit shall direct the wash customer by the correct positioning of the vehicle inside the washing bay. When the vehicle is in place, the operator shall invite the driver and all other passengers to go out from the car, leave the dangerous area which is marked on the floor with yellow and black bands and move to the waiting area.

⚠ *Persons and animals are not allowed to remain on board of the vehicle during the wash cycle.*

Wash customers waiting area

After leaving the car, the driver and the passengers shall move away and stay at a distance of at least 5 meters (16 ft) from the marked dangerous area, waiting there until the wash and dry cycle is completely finished. This distance is necessary to avoid water splashes and breathing of nebulised chemicals fog.

The driver shall get in his car and drive it out of the working area only after the washing cycle is finished.



⚠ *Access to the working area is not allowed when the washing unit is in operation.*

6.5 CONTROL SYSTEM

6.5.1 MAIN SWITCH

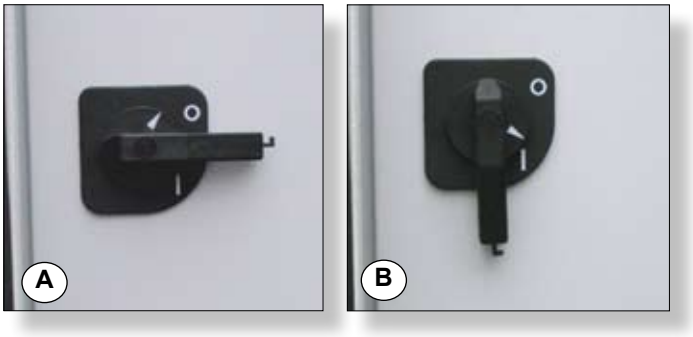
The main switch is placed on the door of the electric cabinet inside the left column of the machine.

- Pos. A

  open switch, machine not powered, O (OFF)
- Pos. B

  closed switch, machine powered, I (ON)

The lever may be blocked in OFF position with a padlock, (padlock not provided).



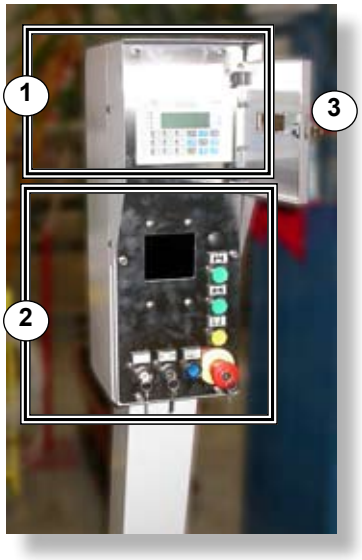
6.5.2 CONTROL PANEL

The standard control panel of the machine, shown in the picture on the side, is installed on a column fixed to the floor, outside the dangerous area.

Closed to this column can be placed another one with the payment system or with the additional control panel already described in section 3.

The panel is divided in two sections:

1. Operator's panel
2. Electromechanical controls and signals.



6.5.2.1 OPERATOR'S PANEL

Operator's panel with soft-touch keyboard and back lighted LCD display.

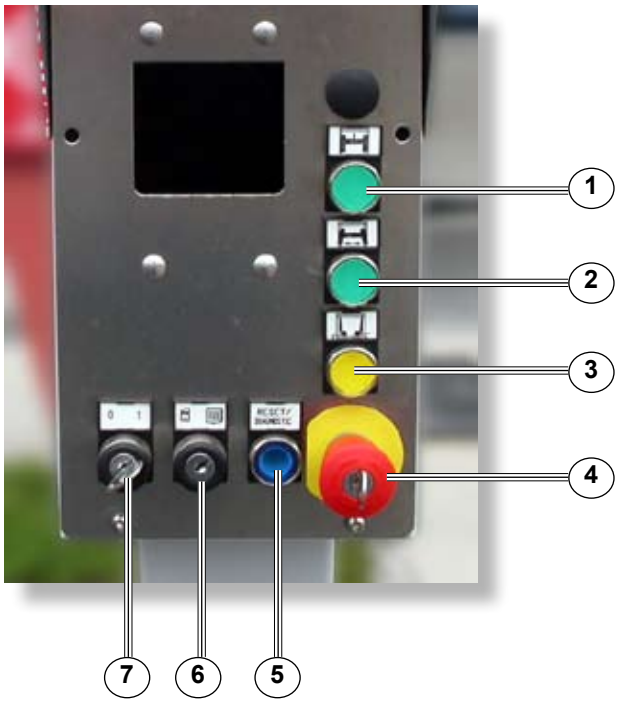
It includes the functions of unit start up, washing programs configuration, customized settings, diagnostics information and machine operation data.

Two levels' passwords control the access to the system parameters.

For the use and the programming of the operator's panel see the attached instructions manual.

When the machine is in "self-service" operation mode, therefore with controls activated on the auxiliary pushbutton panel, the operator's panel is protected by a cover with key lock (3) so that only the display remains visible.

6.5.2.2 ELECTROMECHANICAL CONTROLS



1. Multifunction button.
2. Multifunction button.
3. Multifunction button.
4. Emergency stop button.
5. Button for the alarms reset.
6. Selector switch with key and two fixed positions, for the activation of the “self” payment station.
7. Selector switch with key and two fixed positions, to switch on the auxiliary circuits.

Another emergency stop button is placed on the side of the left column enclosing the electrical equipments. Other emergency stop buttons may be provided according to the unit installation mode, for example for close bays. In any case it is enough to press only one of the emergency buttons to stop the whole unit.

6.5.3 MULTIFUNCTION BUTTONS

They allow the activation of different functions, according to the machine cycle phase, in operation or stand-by.

Button 1 - Pressed with cycle running

Pressed during the <u>washing phase:</u>

- **Lifting of the top brush**. When the button is released the brush gets back in position.

Pressed during the cycle phases: <u>drying/high pressure:</u>

- Controls the **lifting of the top drying nozzle**. Once lifted, the top blower gets back in position when the gantry has travelled on the rails for a distance corresponding to the thickness of the top drying nozzle.

Button 1 - Pressed with the unit stopped

In <u>manual mode</u> (MAN in the UniOP display):

- The drying gantry **moves backward** up to the release of the button or until it reaches the rails’ end limit switch.

Pressed in <u>self service mode</u> (SELF in the UniOP display):

- No function is carried out.

Button 2 - Pressed with cycle running

Pressed during the washing phase:

- Opening of the side brushes. When the button is released, the brushes get back to the former position.

Pressed during the overlapping phase:

- The operation is stopped and the brushes are opened. The cycles will proceed without overlapping wash.

Button 2 - Pressed with the unit stationary

In manual mode: (MAN on the UniOP display)

- The wash gantry **moves forward** up to the release of the button or until it reaches the rails' end limit switch.

Pressed in self service mode (SELF in the UniOP display):

- No function is carried out.

Button 3

Pressed during the washing phase:

- Controls the exclusion of the wheel wash. The button has to be pressed during the gantry run or in the active phase. Once the function has been excluded, it can not be recalled anymore.

Pressed with the unit stopped and out of position:

- It controls the re-positioning of the gantry. Press the yellow button to move the gantry until it reaches the starting position. The pushbutton is not active when the machine has reached the stand-by position.

6.5.4 ADDITIONAL "START" BUTTON

If the unit is used in such a way that the vehicle has to be positioned only after the washing program has been selected (*accept program without vehicle in position*), the machine must be equipped in the installation phase with an additional "start button", through which the wash customer can starts the selected washing cycle. This kind of operation is typical for the units installed indoors, in bays equipped with automatic doors.

Ceccato does not provide this additional cycle start button. Make reference to the wiring diagram for the technical data and the connection of the start button.

6.5.5 SELF-SERVICE PAYMENT DEVICE

Please consult the operating manuals of the relevant devices.

6.6 MACHINE START - PROCEDURES

6.6.1 STARTING PROCEDURES

1. Open the door of the washing gantry left column using the provided key.
2. Turn the switch lever in “I” (ON) position.
3. Close the door of the column, then take out the key.

4. Turn the switch (7) to the right to switch on the auxiliary circuits.

Signals:

- □ Traffic light:
  alternate flashing of red and green lights (“EMERGENCY”)
- □ Uniop:
  The display shows the message “PRESS RESET BUTTON”.

5. Press the button “RESET” (5)

Signals:

- □ Traffic lights:
  Red lights on (“OUT OF POSITION UNIT”)
- □ Uniop:
  The display shows the message “POSITION GANTRY”.

If nothing happens (the message “PRESS RESET BUTTON” remains on), make sure all emergency stop buttons are released and then press the RESET button.

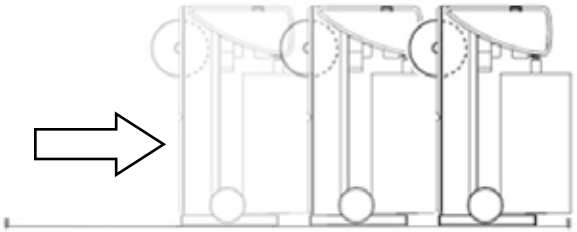
6.6.2 POSITIONING OF THE GANTRY

Press the yellow button to move the unit until it reaches the starting position.

6.6.2.1 Photocell start

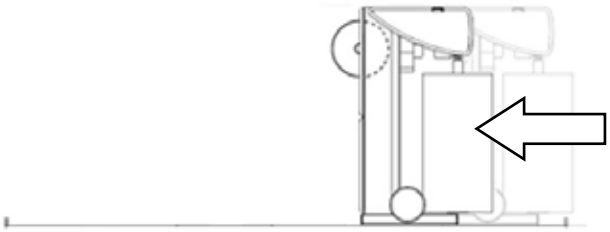
- First phase:

  the gantry goes back until it reaches the beginning of the rails.



- Second phase:

  keeping the yellow pushbutton pressed, the gantry will travel forward until it reaches the starting position.



At this point the unit is in the correct position and ready to carry out the washing cycles.

Signals:

- Traffic lights:

  green lights on (“DRIVE IN”)

- Uniop:

  The display shows the message “POSITION VEHICLE”.

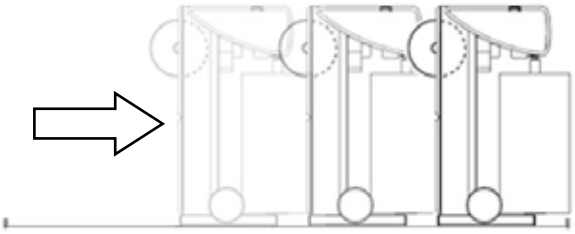
6.6.2.2 VEHICLE POSITIONING ON START BOARD

If the vehicle has to be positioned on a starting board, the washing unit shall be configured accordingly (see Uniop user manual, MENU > SET MACHINE > CONFIGURATION).

If the gantry is not already at the beginning of the rails:

1. Press the yellow push button to move the gantry to the starting position.

   At this point the unit is in position and ready to carry out the washing cycles.



Signals:

- □ Traffic lights:

  green lights on (“DRIVE IN”)

- □ Uniop:

  The display shows the message “POSITION VEHICLE”.

6.6.3 WASHING CYCLES SEQUENCES

The wash cycle starting modalities are different and depend from the machine configuration and from the programming. Following variables influence the starting modality:

1. Start control from the keyboard of the operator's panel (MAN)
2. Start control from the SELF SERVICE payment device (pre-arranged machines)
3. Acceptance of wash program only when the vehicle is correctly positioned
4. Acceptance of wash program when the vehicle is not in the wash bay
5. Positioning with photocells or start board
6. Operation in drive through or dead end wash bay

The machine operation in the different modalities is described in specific cards, that you will find in the next paragraphs.

Every operation sequence card or sheet includes also these data:

1	(1)	Accept program only with vehicle in position	(3)	YES	(4)
✓	(2)	MODALITY		**MANUAL**	

1. Number of the card
2. Validation cell (see explication later on)
3. Conditions of use of the washing unit:
   - □ Processes program only with vehicle in position or out of position
   - □ Working modality, manual or self service
4. State of the conditions of use

Other variables are used inside each card for the description of the operation modalities.

Your washing unit can be operated following the modality of those cards where the validation cell (2) is ticked off.

! *The validation cells (2) must be ticked off during the test or installation phases (or in case of successive changes) by the authorised technical personnel; if there are no validated cells, please contact the Ceccato after sale service.*

6.6.3.1 Explanation of the terms used in the cards

Please find here below some information on the terms used in the cards.

Accept program only with vehicle in position

If the setting is “YES”, the wash program selection, both from the self service controls and the manual mode, will be accepted only after the vehicle is positioned for the cycle start.

Type of wash bay

The machine can be installed in:

1. Drive through bay: the vehicle drives in through the entry door and, at end of cycle, drives out forward through the exit door.
2. Dead end bay: the vehicle drives in and, at end of cycle, drives out backward through the same door.

Positioning of the vehicle

Activation of the machine for the vehicle’s positioning through photocells or start board.

SELF or MANUAL mode

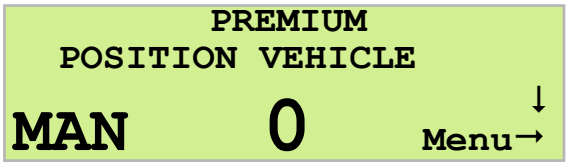
See Uniop manual, “SELF” and “MANUAL” pages.

1. “SELF” page: is the first one which appears when the unit is switched on. With the “Self” page, the choice and the start of the machine are carried out through the remote payment system or the card reader.
2. “MAN” page: With the “Manual” page, the choice and the start of the washing program are carried out through the keyboard of the operator’s panel.

To go from page “SELF” to “MANUAL” and back press the key  o  .

1	Accept program only with vehicle in position	**YES**
	MODALITY	**MANUAL**

1) Positioning the vehicle



Positioning with photocells:

Drive the vehicle forward until the red lights switch on; if the yellow lights switch on, it means that the vehicle is too far forward and it is necessary to drive slightly backwards.

- □ Short bays photocells
  The user shall follow the same procedure. The gantry lightly corrects the starting position to adjust to the vehicle's length.

Positioning with start board:

Drive the vehicle forward until the front wheel is placed on the start board (threadle). Switching on of the red traffic light lamps indicates that the vehicle is in the correct position.

2) Choice of wash program

Enter on the UniOp operator's panel the required program number, with figures from 1 to 15.

To cancel a wrong selection press  . If the selection is not confirmed within 15 seconds, the figure gets back to "0".

3) Program processing

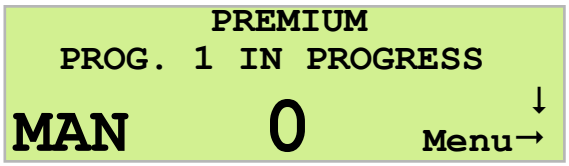
Press the key  on the operator's panel. The system confirms that the chosen program is accepted.

By the selection of a wash program that cannot be carried out by the specific machine, the code is not confirmed and the system waits for another program selection (go back to point 2).

If the vehicle was positioned through the photocell system, the gantry moves backward until it is completely in front of the vehicle.

- □ Short bays photocells
  The movements of the gantry at the beginning of the cycle are aimed at looking for the ideal starting and not always consist in a simple step backward.

4) Waiting for the end of the washing cycle



The gantry carries out the sequence of runs of the selected program and, after the last run, it goes back to the starting position (just over the front of the vehicle).

Traffic light

The green lights switch on (“FORWARD”), advising that the vehicle must be driven out of the washing area.

5) Removing the vehicle from the washing area.

Drive through bay

Drive the vehicle straight forward and slowly; steer only after you are completely out of the washing area.

Dead end bay

Move carefully the vehicle backward and free the washing area.

A few seconds after the release of the photocells or of the start board, the machine will be ready for a new washing cycle.

- Short bays photocells
  When the washing area is free, if the washed vehicle had set up the device “short bays”, the gantry slowly moves to its starting position.

To carry out a further washing cycle without removing the vehicle, proceed as follows:

1. press the red EMERGENCY button;
2. insert the key into the button head, turn it to unlock the button, then take out the key
3. press the blue RESET button.

The unit is ready to carry out another washing cycle.

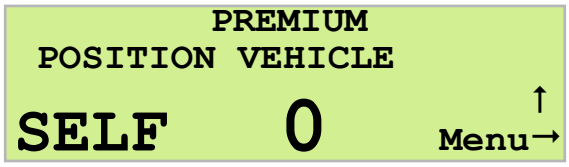
2	Accept program only with vehicle in position	**YES**
	MODALITY	**SELF-SERVICE**

The layout of the operator's panel display shall be as shown at the side. If the machine is operated in "SELF" mode, the door of the control board must be key locked to prevent the access to the keyboard.

1) Positioning the vehicle

Positioning with photocells:

Drive the vehicle forward until the red lights switch on; if the yellow lights switch on, it means that the vehicle is too far forward and it is necessary to drive slightly backwards.



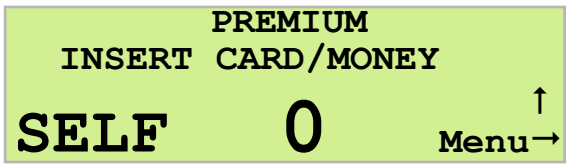
- □ Short bays photocells
  The user shall follow the same procedure. The gantry lightly corrects the starting position to adjust to the vehicle's length.

Positioning with start board:

Drive the vehicle forward until the front wheel is placed on the start board (threadle). Switching on of the red traffic light lamps indicates that the vehicle is in the correct position.

2) Setting the washing program up

The procedures to select and start the washing program can change according to the payment system installed. Please refer to the relevant instructions manual.



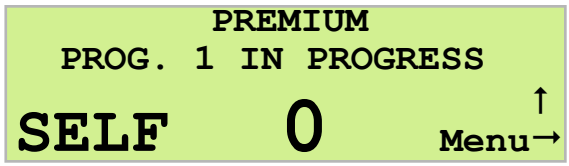
3) Program processing

Once the program has been accepted, the system confirms the processing of the chosen program and the wash cycle starts.

If the vehicle was positioned through the photocell system, the gantry moves backward until it is completely in front of the vehicle.

- □ Short bays photocells
  The movements of the gantry at the beginning of the cycle are aimed at looking for the ideal starting and not always consist in a simple step backward.

4) Wait for the end of the washing cycle.



The gantry carries out the runs sequence of the selected program and at the end of the last run it gets back to the starting position (just on top of the vehicle's front).

Traffic light

The green lights switch on ("FORWARD"), indicating that the vehicle must be removed from the washing area.

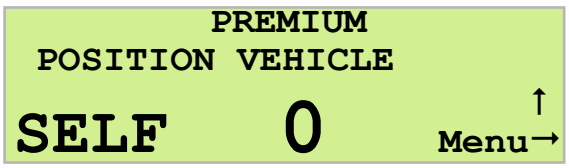
5) Removing the vehicle from the washing area.

Drive through bay

Drive the vehicle straight forward and slowly; steer only after you are completely out of the washing area.

Dead end bay

Move carefully the vehicle backward and free the washing area.



A few seconds after the release of the photocells or of the start board, the machine will be ready for a new washing cycle.

- Short bays photocells
  When the washing area is free, if the washed vehicle had set up the device "short bays", the gantry slowly moves to its starting position.

3	Accept program only with vehicle in position	**NO**
	MODALITY	**MANUAL**

The operator's panel display appears as shown at the side.

1) Choose the program

Enter on the operator's panel UniOp the choosen program number with figures from 1 to 15.

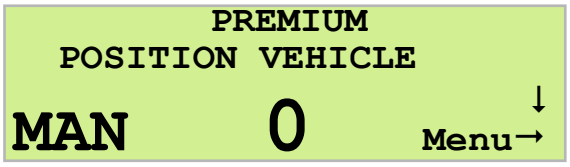
To cancel a number entered press  . If the number is not confirmed within 15 seconds, the value gets back to "0".

2) Program processing.

Press the key  on the operator's panel. The system confirms the processing of the choosen program.

If a non enabled program number is entered the code is not confirmed and the system waits for another number (get back to the point 1).

3) Position the vehicle



Positioning with photocells:

Drive the vehicle forward until the red lights switch on; if the yellow lights switch on, it means that the vehicle is too far forward and it is necessary to drive slightly backwards.

- Short bays photocells
  The user shall follow the same procedure. The gantry lightly corrects the starting position to adjust to the vehicle's length.

Positioning with start board:

Drive the vehicle forward until the front wheel is placed on the start board (threadle). Switching on of the red traffic light lamps indicates that the vehicle is in the correct position.

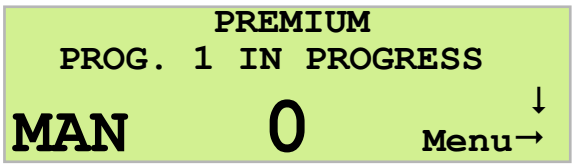
4) Press the button START (see par. 6.5.4)

Once the program has been accepted, the system confirms the processing of the chosen program and the wash cycle starts.

If the vehicle was positioned through the photocell system, the gantry moves backward until it is completely in front of the vehicle.

- □ Short bays photocells
  The movements of the gantry at the beginning of the cycle are aimed at looking for the ideal starting and not always consist in a simple step backward.

5) Wait for the end of the washing cycle.



The gantry carries out the runs sequence of the selected program and at the end of the last run it gets back to the starting position (just on top of the vehicle's front).

Traffic light

The green lights switch on ("FORWARD"), indicating that the vehicle must be removed from the washing area.

6) Removing the vehicle from the washing area.

Drive through bay

Drive the vehicle straight forward and slowly; steer only after you are completely out of the washing area.

Dead end bay

Move carefully the vehicle backward and free the washing area.

A few seconds after the release of the photocells or of the start board, the machine will be ready for a new washing cycle.

- □ Short bays photocells
  When the washing area is free, if the washed vehicle had set up the device "short bays", the gantry slowly moves to its starting position.

To carry out a further washing cycle without removing the vehicle, proceed as follows:

1. press the red EMERGENCY button;
2. insert the key into the button head, turn it to unlock the button, then take out the key
3. press the blue RESET button.

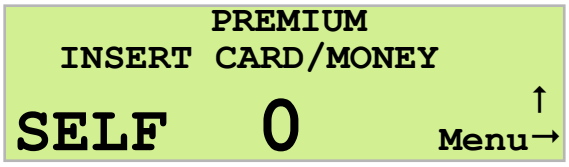
The unit is ready to carry out another washing cycle.

4	Accept program only with vehicle in position	**NO**
	MODALITY	**SELF-SERVICE**

The layout of the operator's panel display shall be as shown at the side. If the machine is operated in "SELF" mode, the door of the control board must be key locked to prevent the access to the keyboard.

1) Setting the washing program up

The procedures to select and start the washing program can change according to the payment system installed. Please refer to the relevant instructions manual.



2) Positioning the vehicle

Positioning with photocells:

Drive the vehicle forward until the red lights switch on; if the yellow lights switch on, it means that the vehicle is too far forward and it is necessary to drive slightly backwards.

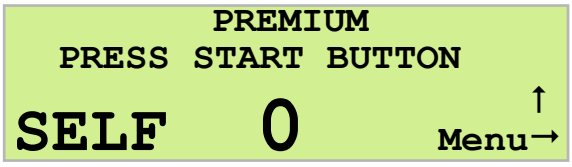
- □ Short bays photocells
  The user shall follow the same procedure. The gantry lightly corrects the starting position to adjust to the vehicle's length.

Positioning with start board:

Drive the vehicle forward until the front wheel is placed on the start board (threadle). The correct position of the vehicle will be confirmed by switching on of the red traffic light lamps.

3) Press the button START (see par. 6.5.4)

Once the program has been accepted, the system confirms the processing of the chosen program and the wash cycle starts.

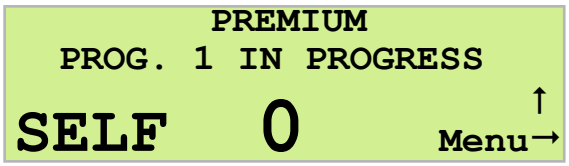


If the vehicle was positioned through the photocell system, the gantry moves backward until it is completely in front of the vehicle.

- □ Short bays photocells
  The movements of the gantry at the beginning of the cycle are aimed at looking for the ideal starting and not always consist in a simple step backward.

4) Wait for the end of the washing cycle.

The gantry carries out the runs sequence of the selected program and at the end of the last run it gets back to the starting position (just on top of the vehicle's front).



Traffic light

The green lights switch on ("FORWARD"), indicating that the vehicle must be removed from the washing area.

5) Remove the vehicle from the washing area

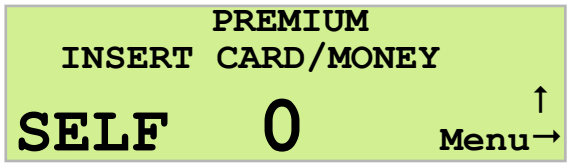
Drive through bay

Drive the vehicle straight forward and slowly; steer only after you are completely out of the washing area.

Dead end bay

Move carefully the vehicle backward and free the washing area.

A few seconds after the release of the photocells or of the start board, the machine will be ready for a new washing cycle.



- Short bays photocells
  When the washing area is free, if the washed vehicle had set up the device "short bays", the gantry slowly moves to its starting position.

6.7 CYCLE STOP MODALITY AND UNIT RESET

6.7.1 VOLUNTARY EMERGENCY STOP

Use the emergency stop buttons in the following cases:

1. Washing cycle under way wrong or not suitable for the vehicle.
2. Imminent danger or safety reason (for example someone is inside the danger area, one of the vehicle's window was left open, etc.).

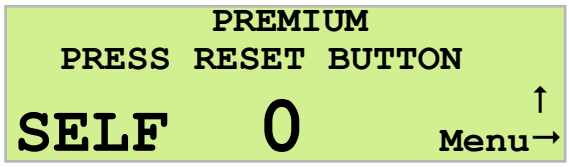
Procedure

To stop the unit immediately press one of the red emergency buttons installed in the machine.

Consequences

The emergency stop causes the following actions:

1. Immediate stop of all groups in their actual position.
2. Disconnecting of the auxiliary circuits, exclusion of the control panel.
3. On the UniOP display appears the message:



□ Traffic light:
alternate flashing of red and green lights ("EMERGENCY")

6.7.2 UNIT RESET AFTER A MANUAL EMERGENCY STOP

To reset the unit after an emergency stop:

1. **Remove** the possible causes of the emergency stop;
2. **Unblock** the emergency stop buttons as follows:
   - □ Emergency stop button on the machine left column: turn it in to unlock the button;
   - □ Emergency stop button on the remote control panel: insert the key into the button head, turn it to unlock the button, then take out the key.
3. **Press** the RESET button (blue button); the side brushes open (if not already open), the top blower and the top brush go up (if not already in upper position); after that it is possible to move the gantry and the vehicle.
4. **Repositioning** (the unit can be stopped out of its stand-by position):
   On the UniOP display appears the message:
   " REPOSITION UNIT "
   keep pressed the yellow button to move the gantry in its starting position.

Once completed these operations, the gantry is in position and ready to carry out washing cycles.

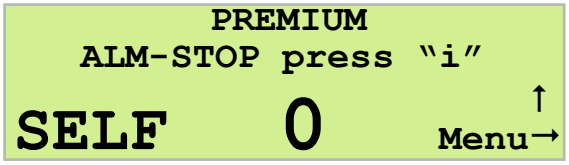
□ Traffic light:
"DRIVE IN" (green)

! *After use, the key of the emergency stop button shall be put and kept in a safe place together with all other keys of the washing unit.*

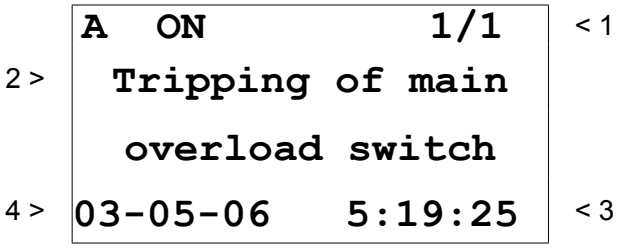
6.7.3 AUTOMATIC STOP BY ALARM

The washing cycle can be automatically stopped in any moment due to anomalies in the unit operation. In this case the consequences are as follows:

1. The unit stops immediately.
2. The power supply of the unit is NOT cut off.
3. Signals:
   - □ Traffic light:
     alternate flashing of red and green lights (“EMERGENCY”)
   - □ Display UniOP
     Following message appears



Pressing the key  the following appears on the display (example).



1. Number of alarms/ total of active alarms.
2. Text of the alarm
3. Hour
4. Date

To go out from the page press the key -  -

If there are more than one alarm, scroll the list with the keys  .

To see the stored alarm list, carry out a specific procedure (see UniOP manual).

6.7.4 RESET OF THE UNIT AFTER AUTOMATIC STOP

To reset the unit after an emergency stop caused by an alarm activation:

1. **Press** the emergency stop button.
2. **Remove** the possible causes of the alarm (see alarm list);
3. **Unblock** the emergency stop button by turning it;
4. **Press** the RESET button (blue button); the side brushes open and the top dryer and top brush go up; now it is possible to drive out the vehicle and move the gantry.
5. **Repositioning** (the unit can be stopped out of its stand-by position):

On the UniOP display appears the message:

“ REPOSITION UNIT “

Keep pressed the yellow button (retentive control) the gantry gets back to its starting position.

Once completed these operations, the gantry is in position and ready to carry out washing cycles.

- □ Traffic light:
  “DRIVE IN” (green)

6.7.5 RESET OF THE OVERLOAD SWITCHES IN THE ELECTRICAL CABINET

All automatic and overload switches are installed inside the electric panel which is fitted into the left side frame column of the gantry.

See chapter 7 for the reset instructions.

! *Only authorised and trained persons are allowed to carry out this operation.*

6.8 ALARMS LIST

In the following table are listed all alarm messages that can be shown on the display of the operator's panel (UniOP) and the cause for their activation.

	ALARM TEXT	EXPLANATION
1	Left SB calibration too low	The power absorbed by the motor controlling the left side brush rotation during the calibration phase is too low
2	Right SB calibration too low	The power absorbed by the motor controlling the right side brush rotation during the calibration phase is too low
3	Left SB calibration too high	The power absorbed by the motor controlling the left side brush rotation during the calibration phase is too high
4	Right SB calibration too high	The power absorbed by the motor controlling the right side brush rotation during the calibration phase is too high
5	Dryer max lifting limit switch faulty	The sensor detecting the max climb of the top blower intervened in an unexpected position or did not intervene in an expected position. Machine with oscillating dryer: the alarm is related to the sensor of maximum forward travel
6	TB max lifting limit switch faulty	The sensor detecting the max climb of the top brush intervened in an unexpected position or did not intervene in an expected position.
7	TB calibration too low	The power absorbed by the motor controlling the top brush rotation during the calibration phase is too low
8	No air	The pneumatic circuit lacks air
9	Dryer movement time-out	The maximum time for the top drying nozzle to reach one of the two travel end limit switched has elapsed
10	Winter discharge	Emptying of all the water arches, outside temperature too low
11	Left SB absorption high	The power absorbed by the motor controlling the left side brush rotation is too high
12	Gantry inverter alarm	Alarm of the inverter controlling the gantry travel
13	Top brush / dryer inverter alarm	Alarm of the inverter controlling the movement of the top brush/top dryer
14	No clean water	The clean water circuit lacks of water
15	Side brushes beam safety	The activation of one of the two sensors of emergency of the beam of the side brushes is preventing the motion of the gantry
16	TB max lifting limit switch out of order	The top brush maximum height control sensor needs to be adjusted
17	Dryer max lifting limit switch out of order	The top dryer maximum height control sensor needs to be adjusted
18	No recycled water	The recycled water circuit lacks of water
19	Gantry clock faulty	The clock sensor of the gantry does not send out the correct inputs during the sliding movement
20	Max. run time	Reached max time scheduled for a run carry out
21	Vehicle too high	The vehicle is higher than the max height allowed

22	Alarm condition	The auxiliary circuit of the unit is disengaged
23	Tripping of main overload switch	One of the overload switches that protect the motors has tripped
24	TB absorption too low	The power absorbed by the motor controlling the top brush rotation is too low
25	TB absorption too high	The power absorbed by the motor controlling the top brush rotation is too high
26	TB calibration too high	The power absorbed by the motor controlling the top brush rotation during the calibration phase is too high
27	Right SB absorption high	The power absorbed by the motor controlling the right side brush rotation is too high
28	PLC battery flat	The PLC battery must be replaced immediately to avoid the loss of the machine working data
29	Tripping auxiliary overload switch	One of the overload switches that protect the motors of the wheels washers or the fans (fault tolerant function)
30	Chemicals low level	At least one of the chemical cans is empty
31	Too low R SBR abs.	The power absorbed by the motor controlling the right side brush rotation is too low
32	Too low L SBR abs.	The power absorbed by the motor controlling the left side brush rotation is too low
33	Top dryer safety failure	Activation time of one of the two safety switches fitted on the top dryer is too long and the gantry movement is stopped
34	Dryer clock faulty or dryer jammed	No expected input of the clock controlling the movement of the top dryer has been registered
35	TB clock faulty or TB jammed	No expected input of the clock controlling the movement of the top brush has been registered
36	Wheelwash sensors	The wheel wash assemblies did not open and reach the stand by position
37	Interrupted PLC/Uniop connection	No communication between the PLC and the UniOP programming device

6.9 ALARMS NOT STOPPING THE MACHINE

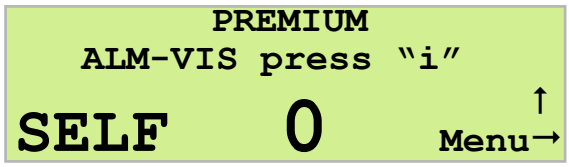
The activation of some alarms will not stop the machine, but only send a message to the operator's panel display. The running cycle will not be interrupted, because the alarm concerns a function or a safety device that are non absolutely required to finish the wash.

Example:

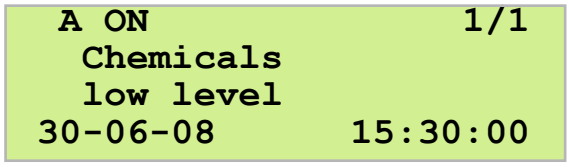
- Auxiliary overload switches
- Flat Plc battery
- No communication PLC/UniOP
- Too low level of wash chemicals

Signalisations:

□ Following message will appear on the UniOP display:



Pressing the key  the following appears on the display (example).



Remove the cause of the alarm to reset the alarm message.

6.10 UNIT SWITCH OFF AT THE END OF THE WORKING DAY

- Cut off the power through the key switch on the remote control device (button panel or other) and take out the keys.
- Cut off the power using the main door-block switch of the washing unit (position "0" - OFF).
- Cut off the power connection of the line which supplies the washing unit.
- Cut off the water and air supplies, upstream of the pipes connecting the washing unit.

6.10.1 PUTTING THE MACHINE OUT OF OPERATION

If the unit has to remain inactive for a long period of time, prepare it accordingly following the instructions given in paragraph 7.12 of chapter 7.

6.11 CHECKING THE SAFETY DEVICES

! *All safety devices installed in the machine shall be regularly checked. The recommended time schedule are given in the table of paragraph 7.11)*

6.11.1 EMERGENCY STOP BUTTON

6.11.1.1 Procedure with machine switched on, in stand-by condition.

With the machine in stand-by (not washing), press one of the emergency stop buttons. Following will happen:

1. Deactivation of the auxiliary circuits and exclusion of the control panel functions.

   Signals:

   - □ Traffic light:

     alternate flashing of red and green lights (“EMERGENCY”)

   - □ Uniop:

     The display shows the message “PRESS RESET BUTTON”.

2. Release the stop button as described in paragraph 6.7.2.
3. Press the button “RESET”. If nothing happens (the message “PRESS RESET BUTTON” remains on), make sure all emergency stop buttons are released and then press the RESET button.

If the machine is equipped with safety cable switches, check if they are activated.

! Call the Manufacturer or the After Sale Service if no reset of the machine is possible after carrying out above controls and operations.

6.11.1.2 Procedure with machine running

Check as described in paragraph 6.11.1.1; pressing of the emergency button will cause the same effect as described above and, additionally, the immediate stopping of all mobile groups and of auxiliary devices.

6.11.2 CABLE TYPE SAFETY SWITCHES

To check the correct operation of the safety cable switches, follow the same procedure used for checking the emergency stop buttons.

The switch must be opened by pulling or pushing the cable with the hand. The force needed shall not be excessive.

See paragraph 4.3.1.2 of chapter 4 to reset the switch.

Check the correct operation of all cable type safety switches.

6.12 ADJUSTMENTS

6.12.1 WASH CHEMICALS ADJUSTMENT

Preliminary information

The amount of chemicals that is distributed during the wash cycle can be adjusted by varying the dosing pumps delivery rate. During the adjustment, the machine must be switched on, but not working.

Procedure

- Switch on the machine, without starting any wash cycle.
- Open the door of the right gantry column and check on the hydro pneumatic panel the position of the dosing pump you need to adjust.
- Follow the pump adjustment procedure, as described in chapter 7.

! *The adjustment of the dosing pumps delivery rate must be carried out with the pump in operation.*

Suggestions:

- Proceed slowly, carrying out little adjustments and checking each time the washing and drying quality.
- As for the products consumptions, make reference to the consumption's table at the end of the chapter

6.12.2 FOAM ADJUSTMENT

During the final tests in the factory our technicians carry out the adjustment for the regular distribution of the foam. To make changes it is necessary to operate on these elements:

- □ Product delivery rate;
- □ Water delivery rate;
- □ Air delivery rate and pressure.

Please adjust the three factors one after the other, considering that:

- More shampoo quantity means richer foam (more colour intensity when using coloured foams);
- More water quantity, more liquid foam;
- More air quantity, more swelling foam.

Furthermore

- The excess of air causes foam mixed to air to come out from the delivery nozzles, sending out little bursts.
- The excess of shampoo causes difficulties in the rinsing phase, an imperfect drying and a mat finishing of the vehicle surfaces.

Procedure

The foam adjustment procedure is described in chapter 7. See the paragraph concerning the "shampoo" nozzles adjustment.

6.13 PROGRAMMES - TIMES – CONSUMPTIONS

In the following table are listed some typical washing programmes, with the relevant cycle times and consumptions, measured on a medium length vehicle.

Program			runs	Time	Recycled water	Clean water	Air	Power	Smoothers	Shampoo Foam	Wax	Super wax	Sonax
				min	litre	litre	litre	kW/h	g	g	g	g	g
					gal.	gal.	gal.	HP/h	oz	oz	oz	oz	oz
					gal. (uk)	gal. (uk)	gal. (uk)						
1	*Forward:*	Wax + Drying	2	1'40"	-	15	-	0.55	-	-	12	-	-
	Return:	Drying				4		0.74			0.45		
						3.3							
2	*Forward:*	Washing + Shampoo	4	3'10"	60	15	5	0.71	-	20	12	-	-
	Return:	Washing + Wax			16	4	1.5	0.95		0.7	0.45		
	Forward:	Drying											
	Return:	Drying			13	3.3	1						
3	*Forward:*	Washing + Shampoo + Finishing	4	3'40"	70	15	20	0.74	-	22	12	-	-
	Return:	Washing + Finishing + Wheels washer + Wax			19	4	5	1		0.78	0.45		
	Forward:	Drying											
	Return:	Drying			15	3.3	4						
4	*Forward:*	PreFoam+ Washing + Finishing + Side high pressure + Robowash	4	3'40"	120	25	50	1.30	-	26	18	-	-
	Return:	Washing + Finishing + Wheels washer + Hot wax			32	7	13	1.74		0.9	0.65		
	Forward:	Wax + Drying											
	Return:	Drying			26	6	11						
5	*Forward:*	PreFoam	6	4'30"	75	15	60	0.94	-	26	-	15	-
	Return:	Washing + Finishing + Wheels washer			20	4	16	1.25		0.9			
	Forward:	Washing + Finishing											
	Return:	Hot wax			17	3.3	13						
	Forward:	Drying											
	Return:	Drying											
6	*Forward:*	Hot smoother	6	5'10"	160	25	70	1.72	80	20	18	-	-
	Return:	Total high pressure			42	7	19	2.3	3	0.7	0.65		
	Forward:	Washing + Shampoo + Finishing + Wheels washer											
	Return:	Washing + Finishing + Hot wax			35	6	16						
	Forward:	Wax + Drying											
	Return:	Drying											
7	*Forward:*	PreFoam	8	7'30"	120	15	140	1.5	-	26	12	-	100
	Return:	Washing + Finishing + Wheels washer			32	4	37	2		0.9	0.45		3.5
	Forward:	Washing + Finishing+ Side high pressure + Robowash											
	Return:	Drying			26	3.3	31						
	Forward:	Formel Plus Sonax											
	Return:	Sonax Brushing											
	Forward:	Hot wax + Drying											
	Return:	Drying											

8	*Forward:* *Return:* *Forward:* *Return:* *Forward:* *Return:* *Forward:* *Return:* *Forward:* *Return:*	Hot smoother Total high pressure Washing + Shampoo + Finishing + Wheels washer Washing + Finishing + Hot wax Drying Formel Plus Sonax Sonax Brushing Hot wax Wax + Drying Drying	10	8'20"	160	25	130	1.83	-	26	12	-	100
					42	7	34	2.5		0.9	0.45		3.5
					35	6	29						

6.13.1 EXPLANATION OF THE DATA

- The measurements were taken using a standard vehicle with a length of 4,5 m (15ft);
- The chemical products used are the ones recommended by Ceccato (please contact the Sales Department of Ceccato s.p.a.).
- The power consumption data include following pumps:
  - □ *fresh water supply pump, 1.5 kW (2HP);*
  - □ *recycled water supply pump 1.5 kW (2HP);*
  - □ *robowash feeding pump, 5.5 kW (7,5HP);*
  - □ *side high pressure pump, 7.5 kW (10HP);*
  - □ *top high pressure pump, 7.5 kW (10HP) ;*

CHAPTER 7

Maintenance

7.1 TYPES OF MAINTENANCE

The recurrent maintenance operations are divided in two groups:

7.1.1 ORDINARY MAINTENANCE

Ordinary or routine maintenance operations are including lubrication, simple cleaning and interventions that may be carried out by the user with basic knowledge of the washing unit.

7.1.2 EXTRAORDINARY MAINTENANCE

Such maintenance works include all those operations which can be carried out only by specialised personnel of the Manufacturer's After Sale Service.

On some of the following paragraphs describing the maintenance works, you will notice the symbol shown below. This means that the mentioned intervention must be carried out by specialised personnel authorised by the Manufacturer.

7.2 GENERAL NOTICES

- Maintenance works shall be carried out only by qualified and authorised personnel.
- During maintenance, the machine must be switched off and disconnected from all energy supplies (machine safe condition, see par. 7.4). Any other condition will be mentioned in the description of the specific operation, to ensure the maximum safety level.
- Before beginning any work, hang out in a well visible position a panel with the information "MACHINE UNDER MAINTENANCE".
- Carry out maintenance interventions according to the schedule and immediately when you notice some malfunction, to avoid worsening of the problem. **Use only original spare parts.**
- Cover immediately with rust protection paint the metal parts which, following mechanical impacts and surface damages, are exposed to oxidation.
- Follow the time schedule and intervals between maintenance operations, as prescribed in this manual.
- Make sure that the working area is well lightened.
- If you are using compressed air, wear protection goggles and a mask; avoid directing the air flow towards your skin or eyes. Ask people standing around to move away, before starting to work.
- Use gloves and goggles when you are working with wash cleaners and other chemicals, or with lubricants.
- Do not disperse chemicals and lubricant in the environment.
- All chemical products shall be disposed of in compliance with the local regulations in force in the country where the washing unit is installed and, in any case, respecting the environment.
- Periodically check the efficiency of the safety devices (see par. 7.11 for the interventions schedule).

At the end of every maintenance work, before starting the machine, the personnel/engineer in charge shall:

- Make sure that al safety devices and protections, if any, which were removed for maintenance are again in place and working.
- Make sure that no foreign body or tool is inside the machine or in the working area.

7.2.1 CLEANING INSTRUCTIONS

Follow following instructions for cleaning the machine:

Painted steel parts

Use denatures alcohol or other specific cleaning products with similar features and scrub with a cloth.

Control panel and external electric components

Clean with a soft cloth, moistened with neutral detergent.

Electric components inside the cabinets

Use a vacuum cleaner (it is strictly forbidden to use compressed air or water).

7.3 SPARE PARTS

7.3.1 HOW TO ORDER SPARE PARTS

Please supply following information when requiring spare parts from the Manufacturer:

- Machine model
- Machine serial number.
- Part number of the required item (see spare parts catalogue).
- Means of transport. In case this point is not specified by the purchaser, the Manufacturer will take care of it, but will not be liable for delays of shipment due to force majeure. The forwarding cost is to be paid by the addressee. All risks and dangers linked to the forwarding of the goods are charged to the purchaser even if it is sold ex works.

Please remind that the Manufacturer is always available for any assistance and/or spare parts requirement.

7.4 MACHINE SAFE CONDITION

The machine is in a safe condition when it is disconnected from all energy sources and specific measures have been taken to avoid a new connection by accident or mistake.

Before beginning with any work, hang out in a well visible position a panel with the information: “MACHINE UNDER MAINTENANCE”.

7.4.1 SAFE CONDITION OF THE ELECTRIC CIRCUIT

1. Cut the power supply upstream of the door-locking main switch in the machine.
2. Make sure that it is impossible for anybody to connect the power supply by mistake or accident. Hang out a panel close to the line isolator switch with the notice “Machine under maintenance, do not touch”.
3. Open the door of the gantry left side, using the key supplied with the machine.
4. Turn the main switch lever to the position “0” (OFF), see picture at the side, and then open the electric cabinet door using the relevant key (you cannot open it if the main switch is in position “I” (ON).
5. Close the gantry left door and take out the key.

It is possible to lock the switch lever in position “O” using a padlock.

7.4.2 SAFE CONDITION OF THE PNEUMATIC SYSTEM

Scope of the procedure

Discharge the residual pressure in the circuit.

Procedure

1. Cut off the compressed air supply line.
2. Open the left side gantry door, using the relevant key.
3. Turn completely in anticlockwise direction the pressure regulator knob (1) to release the pneumatic circuit. The manometer shall read “0”.

! *Even if the pneumatic circuit is empty, the cylinders for the side brushes inclination will remain under pressure.*

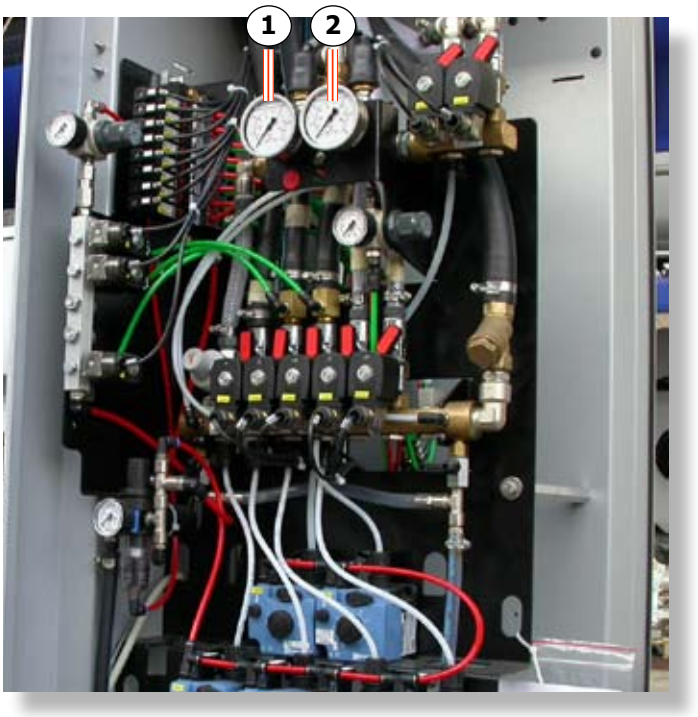
7.4.3 SAFE CONDITION OF THE HYDRAULIC SYSTEM

Scope of the procedure

Discharge the residual pressure in the circuit.

Preliminary note

The hydraulic system of the machine is normally equipped with a device, pump and/or solenoid valve, controlling that the water is delivered to the washing unit only during the cycle. If, for some reason, a continuous pressure is present in the circuit, cut off the supply by closing the relevant interception device (valve or cock).



7.4.3.1 Discharge of the low pressure circuit – fresh/recycled water

Check the pressure gauges of the fresh water (1) and recycled water circuits (2). If they indicate the presence of a pressure in the circuit (normally not more than 6 bar), it is necessary to release it as follows:

- Switch on the machine.
- Using the manual controls on the UniOP panel, open the relevant solenoid valve that is fitted on the main manifold (2). For example:
  - □ for the fresh water circuit, open the “wax water” solenoid valve
  - □ for the recycled water circuit, open the “shampoo water” solenoid valve
- After the opening of the solenoid valve, water will come out from the circuit nozzles and the pressure reading in the pressure gauge will be set to zero.

7.4.3.2 Procedure to discharge the high pressure water circuit

The pipes connecting the high pression pumps (HP) to the main manifold fitted on the gantry's top beam can remain under pressure also when the machine has been switched off. The pressure values can be very high, up to 90 bar (1300 PSI).

Before any intervention on the system, it is therefore necessary to release the pressure.

Act as follows:

- Switch on the machine.
- Using the manual controls on the UniOP panel, open one of the relevant pneumatic valves of the high pressure circuit:
  - □ top HP valve
  - □ side HP valve
  - □ robowash HP valve (if installed).

7.5 LUBRICATION

Intervention

Lubrication of the gantry wheels bearings and of the bearings fitted on the shafts of the drying nozzle and of the top brush.

What is needed

- Number of operators: 1
- Machine switched off, with main switch turned to position “0” (OFF).

Materials and equipment

- Lubricant type 1, as shown in the table of paragraph 7.5.3
- Manual grease pump.
- Sturdy scaffold, to reach the high components.

Residual hazards and safety measures

Risk of slipping on wet floor.	
Wear slip-proof shoes	
Wear protective gloves	

Procedure

All bearings are equipped with greaser for the introduction of lubricant. The position of the bearings and how to reach them is explained in the following paragraphs.

Warnings

Be careful when lubricating the bearings. The introduction of a big amount of grease under pressure may damage the bearings protection ring.

7.5.1 CENTRAL LUBRICATION

Position of the greasing valves

If the machine is equipped with central lubrication system, all bearings greasing valves are fitted together on manifolds (see picture) which are installed inside the columns of the gantry. Open the frame doors to reach the manifolds.

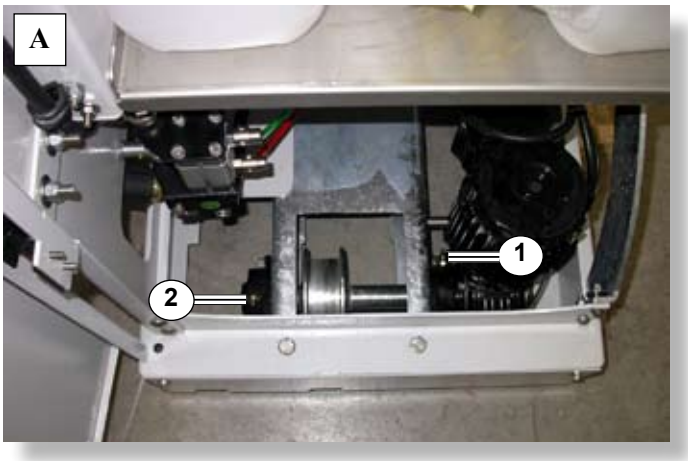
Procedure

1. Grease is injected by pulling 2-3 times the lever of the pump.

! *Be careful when lubricating the bearings. The introduction of a big amount of grease under pressure may damage the bearings protection ring.*

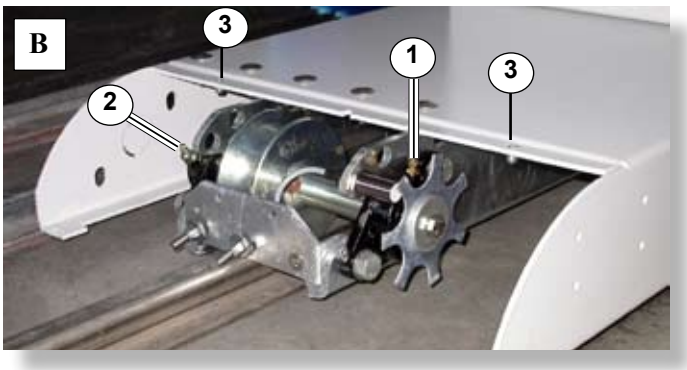
7.5.2 STANDARD LUBRICATION SYSTEM

7.5.2.1 Lubrication of the gantry wheels



Entry side (pict. A)

1. Open the doors of both columns.
2. Clean the greasers (1-2).
3. Inject the grease pressing 2-3 times the greasing pump lever.



Exit side (pict. B)

1. Screw out the two screws (3) and remove the front protection of the foot.
2. Clean the greasers (1-2).
3. Inject the grease pressing 2-3 times the greasing pump lever.
4. Install the front protection again.

External bearings (pict. C)

Because of the special distance between the rails, it is possible that the internal bearings will be outside of the frame feet, as shown in the picture.

! *Be careful when lubricating the bearings. The introduction of a big amount of grease under pressure may damage the bearings protection ring.*

7.5.2.2 Lubrication of the lifting shafts bearings

Top dryer lifting shaft

1. Place and secure a ladder in order to reach one of the shaft ends.
2. Clean the greasers (1).
3. Inject the grease pressing 2-3 times the greasing pump lever.
4. Carry out the same operation with the bearing at the other side of the shaft.

! *Be careful when lubricating the bearings. The introduction of a big amount of grease under pressure may damage the bearings protection ring.*

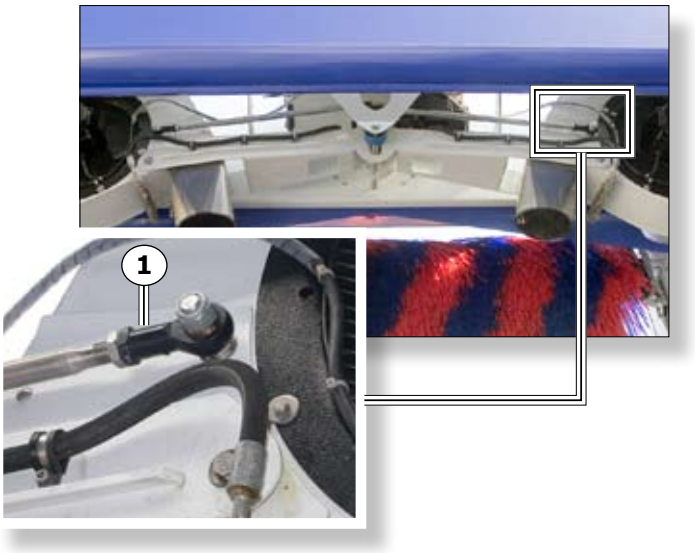
Top brush lifting shaft

Follow the same procedure as for the top dryer. In this case only one bearing, on the right side, is installed and need to be lubricated.

! *Be careful when lubricating the bearings. The introduction of a big amount of grease under pressure may damage the bearings protection ring.*

7.5.2.3 Lubrication of the drying blowers oscillation joints

1. Place a step ladder in a suitable position to reach the lubrication points.
2. Clean the greaser (1).
3. Inject the grease pulling 2-3 times the grease pump lever.
4. The same operation shall be carried out at the other end of the shaft and on the joints of the other shaft



7.5.3 TABLE OF LUBRICANTS

Supplier	Type 1 Bearings	Type 2 Trqnsmission chains	Type 3 Motor gears	Type 4 Air regulator
Agip				
castrol	OLISTA LONGTIME 2			
esso				
ip			TELIUM OIL VSF	
KLÜBER LUBRICATION			SYNTHESO D220EP	
Mobil			GLYCOLUBE RANGE 220	
Shell			TIVELA OIL SC320	

7.6 MAINTENANCE OF THE BRUSHES

7.6.1 FASTENING OF THE SIDE BRUSEH

Intervention

Check that the brush shafts are well secured to the motor gear flanges.

Concerned items

All brushes installed.

What is needed

- Number of operators: 1
- Side brushes open
- Top brush lifted approx. 1 m (40”) from the floor.
- Machine shall be switched off; or press the emergency button and take out the key.

Equipment

- Solid step ladder, height 1-1,5 m (40”-60”), to reach the high components.

Residual hazards and safety measures

Risk of slipping	
Wear slip-proof shoes	

Procedure

Check that all 4 screws (1) securing the brush shaft to its relevant motor gear flange are tightened.

The bolts are made of steel with a tensile strength ratio of 1.11 and “Dacromet” corrosion proof surface treatment. Apply some thread lock liquid before fastening the screws, for example “Loctite 242”.

7.6.2 CLEANING THE BRUSHES – GENERAL INFORMATION

7.6.2.1 Main causes for dirty brushes

There are many different reasons causing dirtiness of the brushes, for example: washing without shampoo, use of incompatible wash chemicals, wrong position of the distribution nozzles. (*see paragraph 7.9.3, adjustment of the spraying nozzles.).*

Often the top brush gets dirty because of the wrong position of the wax nozzles. In fact it can happen that wax is falling not only on the vehicle but partly also on the brushes.

The side brushes can get dirty because of the wrong position of the rear side washing nozzles.

There are several specific products for brush cleaning available in the market.

7.6.2.2 Cleaning the brushes

What is needed

- Number of operators,1
- Side brushes open
- Top brush lifted approx. 1 m (40”) from the floor.
- Machine shall be switched off; or press the emergency button and take out the key.

Equipment

- Solid step ladder, height 1-1,5 m (40”-60”), to reach the high components..
- Specific brush cleaner.

Residual hazards and protective measures

Risk of slipping on wet floor	
Chemical hazard (consult the safety card of the relevant cleaner)	
Wear slip-proof shoes	
Wear protective gloves (*follow the instructions of the chemical supplier)*	

Procedure

1. Use the manual controls to close the side brushes and lower the top brush. This position of the brushes will allow you to save cleaning product.
2. Machine shall be switched off; or press the emergency button and take out the key.
3. Apply the cleaning product following the instructions of the Manufacturer (normally by spraying).
4. Turn manually the brush shafts to distribute evenly the product on the brushes.
5. Leave the product enough time on the brushes (usually a few hours reaction time).
6. Rinse the brushes with low pressure water.
7. Switch on the machine and move the brushes to the stand by position.

Prohibitions

!

- *Do not switch on the motors to rotate the brushes when distributing the cleaner.*
- *Do not use high pressure water, or hot water, for rinsing as the brushes may be damaged.*

7.6.3 CONTROL OF THE BRUSHES

Intervention

Check the good condition and the wear of the brushes.

Concerned items

All brushes installed in the machine.

What is needed

- Number of operators,1
- Side brushes open
- Top brush lifted approx. 1 m (40”) from the floor.
- Machine shall be switched off; or press the emergency button and take out the key.

Equipment

- Solid step ladder, height 1-1,5 m (40”-60”), to reach the high components.

Residual hazards and safety measures

Risk of slipping on wet floor.	
Wear slip-proof shoes	

7.6.3.1 Polyethylene brushes

Preliminary note

The polyethylene threads are subject to wear due to washing operation and deterioration due to ultraviolet rays.

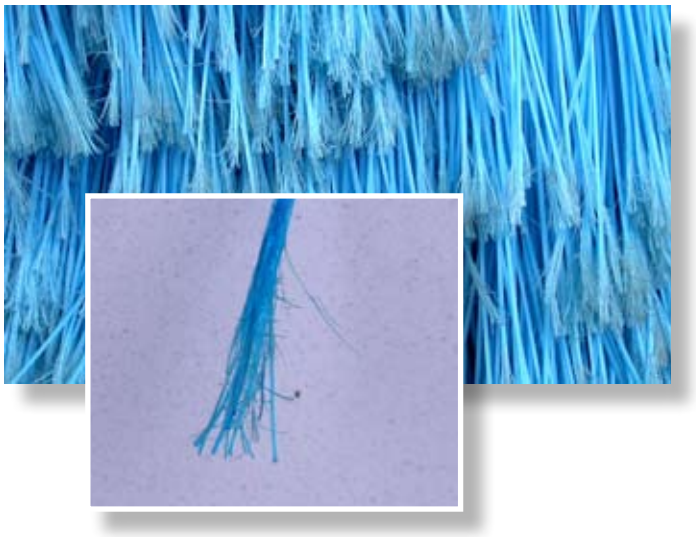
Control of the diameters

Diameter of the side brushes is 1000 mm ((40”) and the diameter of the top brush is 900 mm. The diameter of all brush shafts is 114 mm (4”$^{1/2}$)

The length of the thread shall not be less than 345-350 mm (13”$^{1/2}$ - 13”$^{3/4}$) for the top brush and not less of 395-400 mm (15”$^{1/2}$ - 15”$^{3/4}$) for the side brushes.

Control of the wear

When in good conditions, the polyethylene thread must show at its end the “flock” (see picture) which is very important for a good cleaning action of the brushes. The flocks will remain and form again when the length of the thread is decreasing due to mechanical wear, but will disappear when the material is too deteriorated or old.



Control of the deterioration

UV rays cause deterioration of the threads and loss of elasticity. The threads tend to split lengthwise and the washing efficiency is diminished.

When you see many damaged threads, the brushes need to be replaced. Please contact the Ceccato After Sale Service.

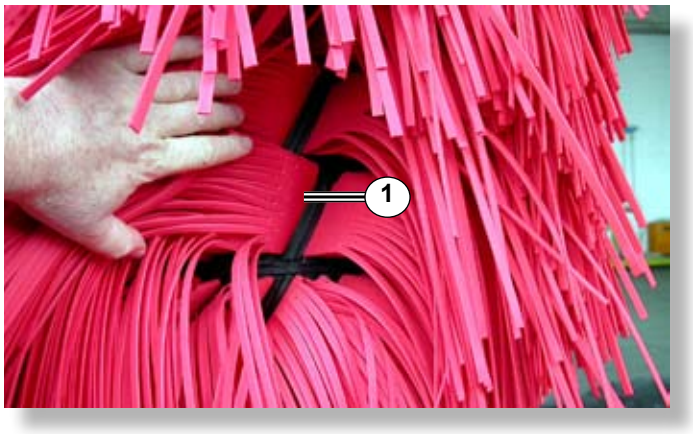
Practice has shown that UV rays deterioration is occurring well in advance of thread length decreasing due to wear.

The time interval normally foreseen between replacements of the brush set is given in the table of paragraph 7.11. Call the Ceccato After Sale Service for replacement

Intervention

When you see many damaged brush threads, the brushes need to be replaced. Please contact the Ceccato After Sale Service.

7.6.3.2 “Foam touch” brushes



Control of the wear

Wear and deterioration are revealed by following signs:

- appearing of micro fractures on the joint (1) of the shaft;
- reduction of the stripes thickness, mainly towards the ends;
- excessive porosity of the material, tendency to get dirty;
- twisting of the stripes;
- modification of the physical state of the material, increasingly “gummy”.

The time interval normally foreseen between replacements of the brush set is given in the table of paragraph 7.11. Call the Ceccato After Sale Service for replacement

Intervention

When you see many damaged brush stripes, the brushes need to be replaced. Please contact the Ceccato After Sale Service.

7.7 BELTS MAINTENANCE

7.7.1 CONTROL OF THE BELTS

Intervention

- Check the conditions and wear of the flat belts

7.7.1.1 Conditions and wear of the belts

Concerned items

Flat belts for lifting of the top brush and of the top dryer.

What is needed

- Number of operators, 1
- Side brushes completely closed.
- Top brush and top dryer to the lowest position.
- Machine shall be switched off; or press the emergency button and take out the key.

Equipment

- Sturdy scaffold, to reach the high components.

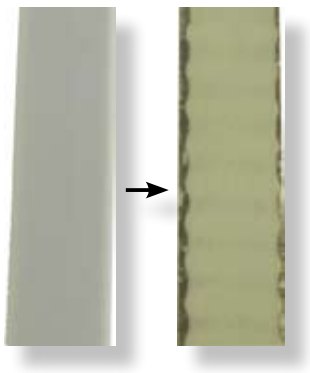
Residual hazards and protective measures

Risk of slipping on wet floor.	
Risk of entanglement with exposed parts of the belts	
Wear slip-proof shoes	
Wear protective gloves	

Control parameters

The belts shall show no damage, cut or protruding steel wires. In case of damage, have the belt immediately replaced by the Ceccato After Sale Service.

It is possible that, with the time, the belts may change slightly their colour and become yellowish, but this does not mean that they are deteriorated or that the belt performances are reduced.



7.7.1.2 Belts stretching

Concerned items

Driving belts of the side brush trolleys.

What is needed

- Number of operators: 1
- Machine shall be switched off; or press the emergency button on the control panel and take out the key.

! *This operation shall be carried out by technical personnel of the Manufacturer or by authorised engineers.*

7.7.2 BELTS MAINTENANCE

Intervention

- Application of protective product.

Concerned items

Top brush and top dryer lifting belts.

What is needed

- Number of operators, 1
- Side brushes completely closed.
- Top brush and top dryer to the lowest position.
- Machine shall be switched off; or press the emergency button and take out the key.

Equipment

- Sturdy scaffold, to reach the high components..
- PTFE spray lubricant (for example Arexons TT163)

Residual hazards and protective measures

Risk of slipping on wet floor.	
Chemical hazard due to contact or inhalation	
Wear slip-proof shoes	
Wear goggles and mask	

Procedure

1. Spray lubricant quickly as shown in the figure, without exceeding the normal amount.
2. Proceed the same way with the side brush trolleys driving belt.

7.8 MAINTENANCE OF MECHANICAL COMPONENTS

7.8.1 TOP BRUSH GUIDING ROLLERS

Intervention

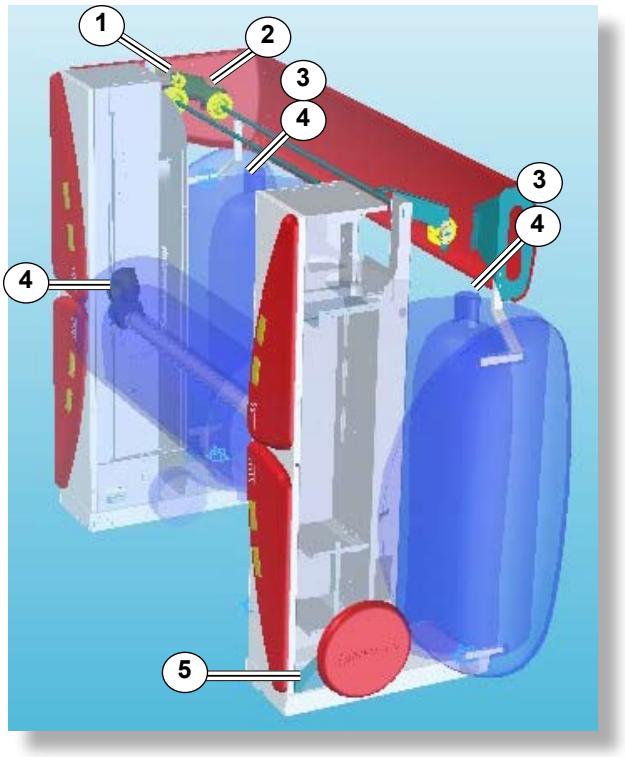
Control and replacement, if needed, of the guide rollers for the vertical movement of the top brush.

Concerned items

1. Top brush

! *This operation shall be carried out by technical personnel of the Manufacturer or by authorised engineers.*

7.8.2 REDUCTION GEARS



Intervention

Check from time to time that there are no oil leakages from the motor gear boxes.

Concerned items

1. top dryer lifting system;
2. top brush lifting system;
3. side brushes translation system (two groups);
4. side brushes rotation system (two groups);
5. top brush rotation;
6. gantry movement system (two groups).

What is needed

- □ Number of operators, 1
- □ Top dryer at mid height.
- □ Top brush at mid height
- □ Machine shall be switched off; press the emergency button on the control panel and take out the key.

Equipment

- □ Sturdy scaffold, to reach the high components

Residual hazards and protective measures

Risk of slipping on wet floor	
Wear slip-proof shoes	

Diagnosis and intervention

In case of oil leakages, call the Ceccato After Sale Service.

7.8.3 TOP DRYER GUIDING ROLLERS

Intervention

Control and replacement, if needed, of the guide rollers for the vertical movement of the top dryer.

Concerned items

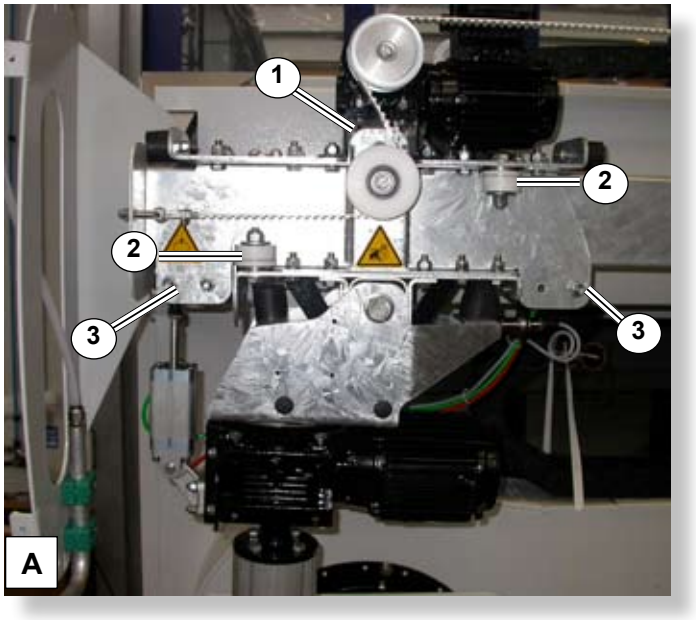
1. Top drying nozzle.

! *This operation shall be carried out by technical personnel of the Manufacturer or by authorised engineers.*

7.8.4 BRUSH TROLLEYS GUIDING WHEELS

Intervention

- Check the condition of the sliding rollers of the side brush trolleys.
- Check the clearance between the rollers and the beam.



Concerned items, on each trolley

1. top roller;
2. four side rollers, mounted diagonally, two each side;
3. two bottom rollers.

! *This operation shall be carried out by technical personnel of the Manufacturer or by authorised engineers.*

7.8.5 GANTRY TRANSLATION GROUP

Intervention

- Disassembling of the wheels to replace the bearings.

Concerned items

1. Idle and driven gantry wheels.

! *This operation shall be carried out by technical personnel of the Manufacturer or by authorised engineers.*

7.8.6 ACCESSORIES ON THE WASH BAY FLOOR

Intervention

- Check that following components are well anchored to the floor:
  - □ wheel guides
  - □ rails
  - □ rail end stop brackets
  - □ cams for the activation of the gantry sensors
  - □ bands marking the working area
  - □ underchassis wash (if installed)

What is needed

- Number of operators, 1
- Machine switched off; emergency button on the control panel pressed and key removed.

Equipment

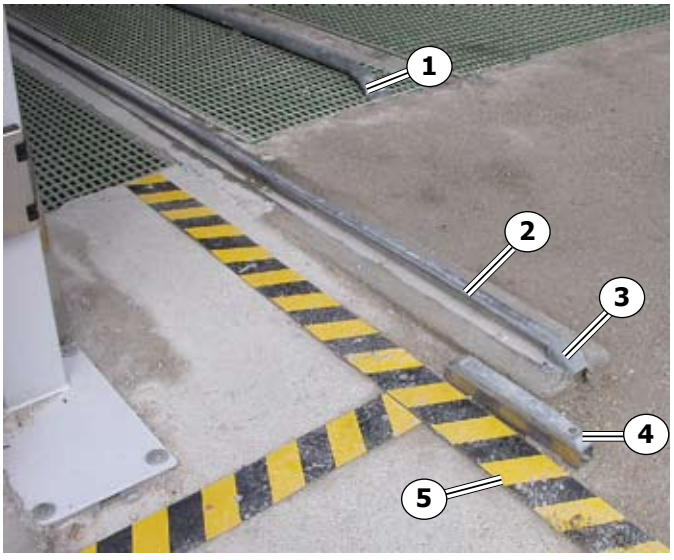
- Set of spanners

Residual hazards and protective measures

Risk of slipping on wet floor	
Wear slip-proof shoes	

Diagnosis and intervention

Replace the rails stops if they are damaged.



Note on the points from 1 to 4

If the loosening of floor accessories is due to settling of the expanding dowel, please contact the Ceccato after sale service for instructions.

Note on point 5

The bands shall lay flat on the floor in order to avoid any danger of stumbling. Fix them with silicone if necessary.

7.8.7 CONTROL OF THE STOP-BLOCKS

Intervention

- Check the condition of the mechanical stop-blocks and their supports.

Concerned items

1. trolleys of the side brushes
2. top dryer
3. top brush

The check points are shown in the following layout.

What is needed

- □ Number of operators, 1
- □ Top brush at mid height.
- □ Top dryer slightly lowered.
- □ Machine shall be switched off; press the emergency button on the control panel and take out the key.

Equipment

- □ Solid step ladder, height 1-1,5 m (40”-60”), to reach the high components.
- □ Set of spanners

Residual hazards and protective measures

Risk of slipping on wet floor	
Wear slip-proof shoes	

Diagnosis and intervention

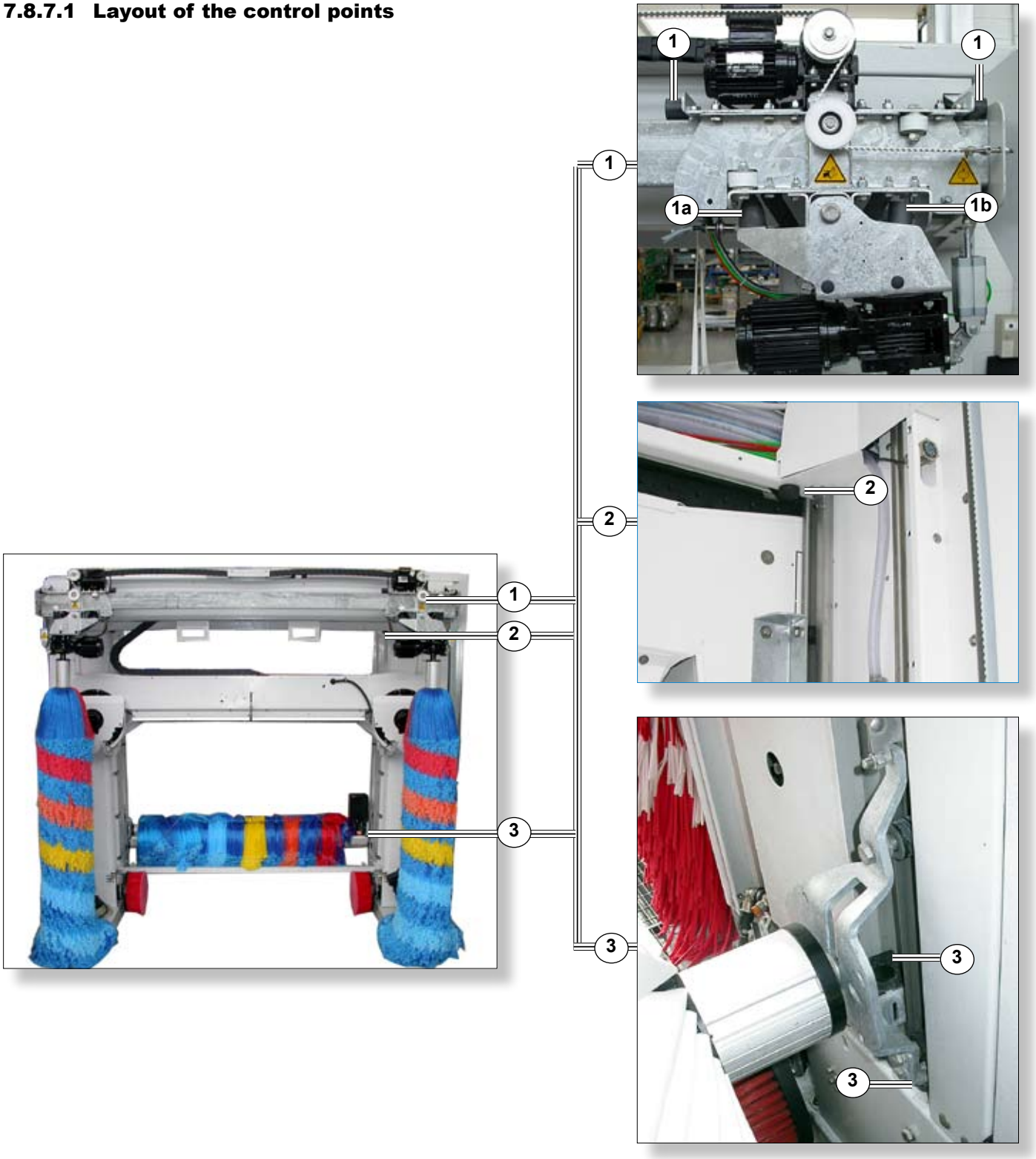
If the stop-blocks are damaged, due for example to extra-run of the mobile element, replace them immediately.

Check more frequently the buffers (1a-1b p.fo 7.8.7.1) that are subject to continuous operation.

Almost all buffers are made with a rubber block secured to a screw support. Screw out the locking nut to replace the buffer.

! *This operation shall be carried out by technical personnel of the Manufacturer or by authorised engineers.*

7.8.7.1 Layout of the control points



7.8.8 ANTI COLLISION BARS

7.8.8.1 Anti collision ring

7.8.8.2 Anti collision bars

Intervention

- Control of the system geometry.
- Mechanical control.
- Control of the sensors.

Concerned items

1. Top drying nozzle.

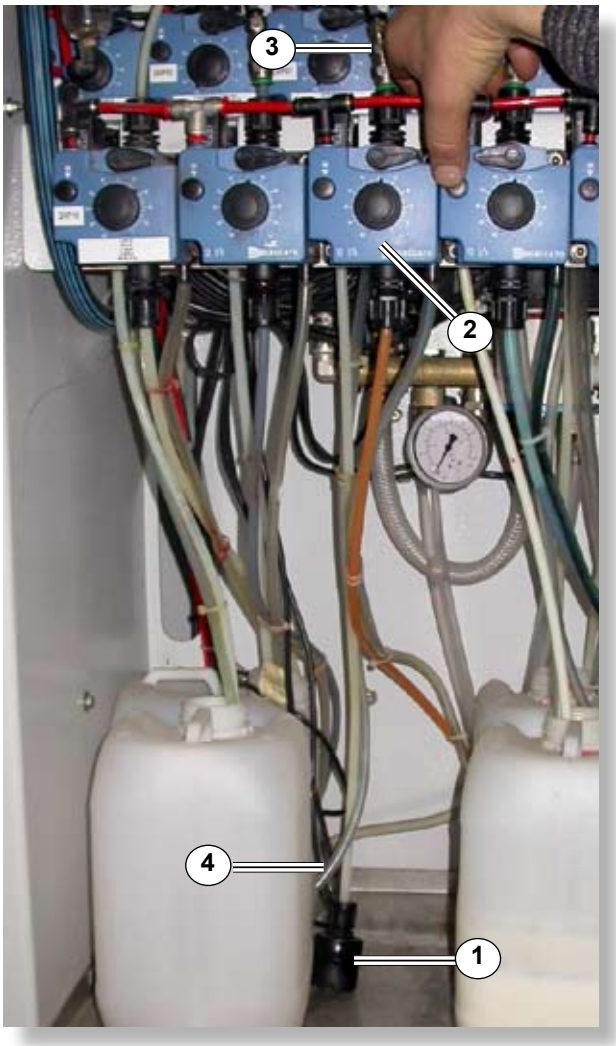
! *This operation shall be carried out by technical personnel of the Manufacturer or by authorised engineers.*

7.9 MAINTENANCE OF THE HYDROPNEUMATIC SYSTEM

7.9.1 DOSING PUMPS

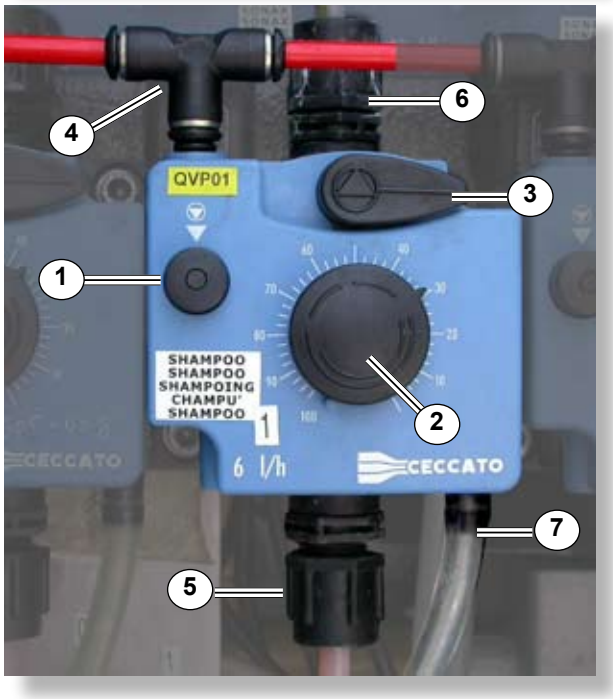
The dosing pump circuit includes following components:

1. Suction pipe with filter and non return valve at its end
2. Membrane pump
3. Delivery pipe
4. Pipe to take the wash chemical back into the transparent plastic can.



Description of the pump

1. Manual operation pushbutton.
2. Delivery rate adjustment handle.
3. Working mode selector switch, normal operation or recirculation.
4. Compressed air input.
5. Suction pipe screw type union with in-built non return valve.
6. Delivery pipe screw type union with in-built non return valve.
7. Pipe fitting and pipe to take the wash chemical back to the transparent plastic can (pressure type pipe joint)



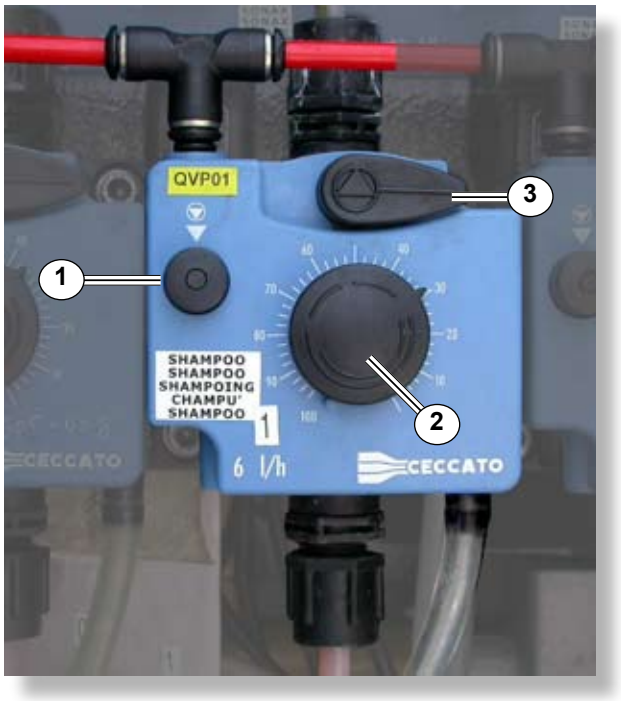
7.9.1.1 Dosing pump operating instructions

!

- *The dosing pump shall never be operated without product, otherwise it could be damaged. The level of the product in the chemical cans shall therefore be checked very often.*
- *Before changing or topping up the wash chemicals, press the emergency stop button and lock it with the relevant key.*
- *If the wash chemical can is almost empty and no chemical supply is available, have the pump working in recirculation mode.*
- *When the can is empty and the chemical is water based, add water in the can and have the pump working in recirculation mode.*
- *When the can is empty and the chemical is not water based, do not use the relevant washing program.*

Procedure for the pump priming

1. Open the compressed air circuit (also with the machine switched off).
2. Turn the deviation handle (3) to the left.
3. Press the pushbutton (1) several times. A suction and delivery cycle is carried out with every button pressure.
4. Proceed until the drawn-in product returns to its can through the recirculation pipe.
5. When the pump is primed, turn the handle (3) to the right to enable the delivery circuit.
6. Close the cabinet door.



! *Never press the loading button when the deviation handle is turned to the left, as in this position the circuit is put under pressure and some gasket might be damaged.*

Procedure to change the pump delivery rate

To change the pump delivery rate, proceed as follows:

1. Pull out the handle (2) until you here a “click”;
2. Press several times the loading button and, at the same time, turn slowly the handle to the required position, referring to the position of the pointer in relation to the round scale;
3. Press the handle and lock it in the new position.

!

- *It is important to press the loading button at the same time with the handle rotation, otherwise the pump may be damaged.*
- *Follow the same procedure both for increasing or reducing the pump delivery rate.*

Replacement of the valves and filter

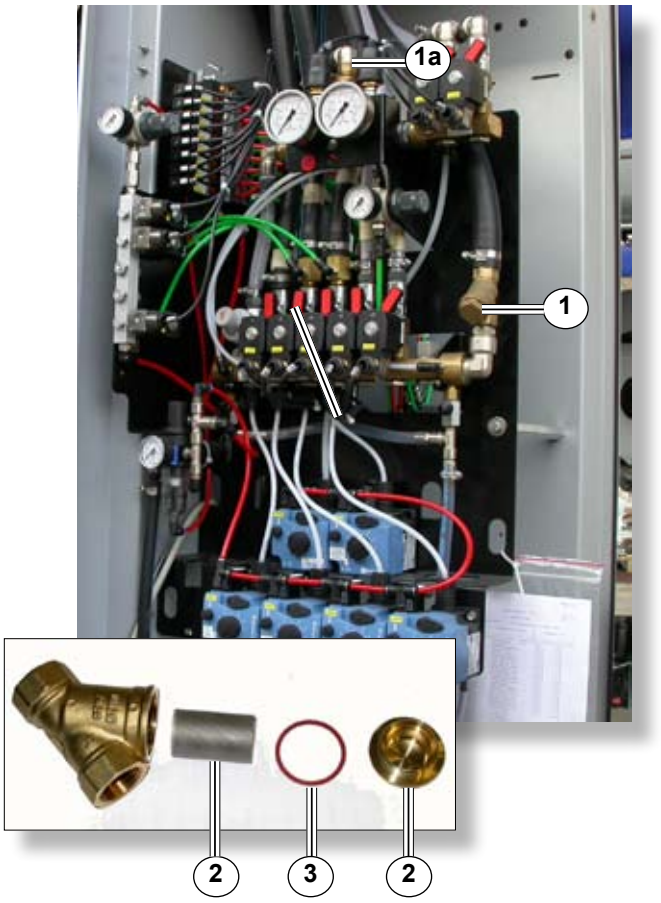
To clean the filer at the end of the suction pipe, disconnect it and rinse with running water, replace the filter if damaged or encrusted.

If you notice that the suction and delivery pipes run dry, this means that the non return valves are broken. In this case it is necessary to replace the complete valve kit (see spare parts catalogue). Pay attention not to reverse the top and bottom connections when reassembling the valves, as their operation mode is opposite.

!

- *Before starting with the cleaning or replacement of the filters, press the emergency stop button and lock it using the relevant key.*
- *Wear gloves and goggles during the operation.*

7.9.2 WATER FILTERS



Intervention

- Control and cleaning.

Concerned items

1. Filters fitted to the hydraulic panel (the check points are shown in the diagram below).
2. Filters installed in the connection pit.

What is needed

- □ Number of operators, 1
- □ Machine in safe condition (electrically and hydraulically)

Equipment

- □ Scaffold with a sturdi and large platform, height 40-50 cm, to reach the high components.
- □ Set of spanners

Residual hazards and protective measures

Risk of slipping on wet floor.	
Wear slip-proof shoes	

Procedure

1. Open the right hand side door of the gantry.
2. Use a spanner to unscrew the cap (1).
3. Take out the steel net filter (2) and clean it first with running water and then with compressed air.
4. Check whether the gasket (3) is damaged, replace it if needed.
5. Insert the filter into its seat and screw in the tap.
6. Repeat the same operation with the fresh water filter (2a) and with the filter installed in the hydraulic group installed in the connection pit.

7.9.3 WASHING NOZZLES – MAINTENANCE AND ADJUSTMENT

All nozzles must be correctly positioned in order to grant the best distribution of water and wash chemicals, diminish chemical products waste and maintain the brushes and the machine frame in good conditions.

The adjustments described in the following paragraphs refer to a machine working in a wind free environment (for example indoor installation). It is also possible that, under different environmental conditions, the position of the nozzles, the water jets delivery rate and pressure need to be modified to comply with the correct working parameters.

7.9.3.1 Instructions for cleaning and replacing the nozzles

All nozzles can be disassembles by unscrewing them in anticlockwise direction, using a standard spanner.

To remove obstruction of the nozzle, dismount it and clean with a needle and then with compressed air.

The high pressure nozzles and the nozzles of the vertical arches shall be secured using some thread locking liquid product (ex. Loctite 577), as they do not need to be further adjusted. All other nozzles are screwed in using a teflon film and their position can be then slightly adjusted.

Water distribution from all nozzles, except the "front shampoo" ones, can be activated using the manual controls of the Operator's Panel (see the enclosed programming manual). These operations do not normally require a long intervention time and can be carried out with the machine working in manual mode. It is however recommended to hang out at the wash bay entry side a warning panel with the notice "machine out of operation".

! *As more time is needed for the replacement of the nozzles, put the machine in safe condition as described in paragraph 7.4 before starting with the intervention.*

7.9.3.2 High pressure nozzles

Scope

These nozzles have a double function:

1. low pressure application of pre-wash cleaner to soften the dirt, so that it is then easier to remove;
2. removal of the dirt from the vehicles' surfaces, using high pressure water jets.

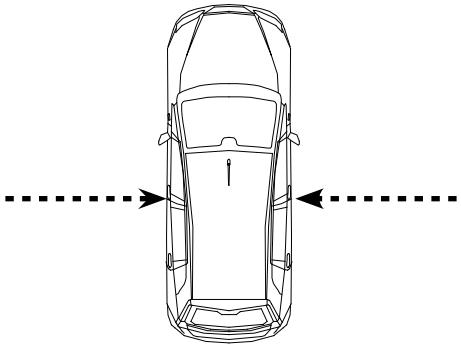
The nozzles are secured to the water arches in such a way that their openings are inclined by 5° to avoid that the water jets are interfering, reducing efficiency.

As the nozzles have to be secured with thread locking liquid (ex. Loctite 577), it is important to adjust them before they are locked.

Adjustment of the position

The direction of the water jets must be perpendicular to the surface of the vehicle. If it is necessary to modify the position of the arch, remove the front protection, loose the arch clamps and turn the pipe.

The top arch is fitted to the contour following top dryer and cannot be adjusted, as it follows the inclination of the dryer.



7.9.3.3 Vertical water delivery arches

Scope

These nozzles are directed towards the side brushes or the sides of the vehicles and have following functions:

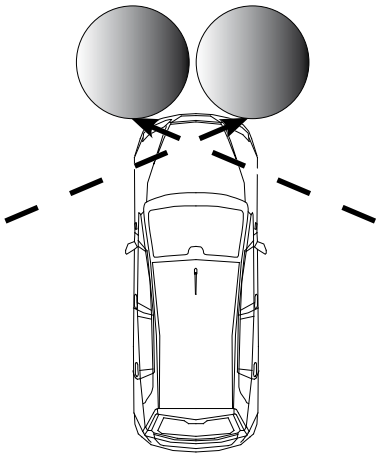
- distribution of foam during the brush operation;
- distribution of standard shampoo;
- rinsing.

The nozzles are secured to the water arches in such a way that their openings are aligned. As the nozzles have to be secured with thread locking liquid (ex. Loctite 577), it is important to adjust them before they are locked.

Adjustment of the position

The water jets shall be directed in order to reach the side brushes when these are closed in the centre of the gantry frame.

If it is necessary to modify the position of the arch, remove the front protection, loose the arch supports clamps and turn the pipe.



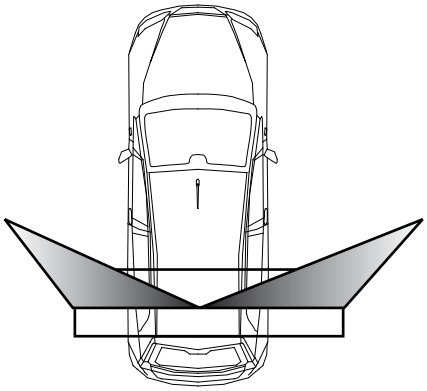
7.9.3.4 Top water nozzles

Scope

The function of these nozzles is to wet the top brush. The water jet comes out with an inclination of 15° and an angle which is starting from the middle of the top brush and opening towards the sides.

Adjustment of the position

The water jet direction is shown on the drawing.



By modifying accordingly the position and the delivery rate, each nozzle must distribute water over at least half of the brush.

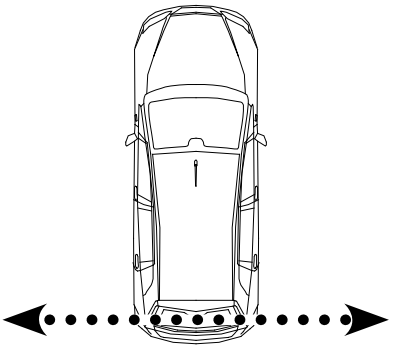
7.9.3.5 “Front shampoo” nozzles

Scope

The “front shampoo” nozzles are used for following functions:

- □ distribution of foam;
- □ distribution of standard shampoo;
- □ rinsing.

The water jets from the nozzles are vertical and perpendicular to the surface of the vehicle.



Adjustment of the position

The direction of the water jets is perpendicular to the surface of the vehicle, as shown in the following drawing.

To change the jets direction, bend slightly and with care the nozzles arms.

Adjust the position of the nozzles to become a shape of the water jets as shown in the picture.

To align the water jets with the vertical axis, turn them using a standard spanner and/or lift the support arm.

The nozzles are screwed in with teflon tape.

Generation and adjustment of the foam

Foam is obtained by mixing detergent, water and air with the correct pressure and delivery ratio. When using Ceccato wash chemicals, the foam generation system does not normally need any adjustment.

An adjustment can be necessary to change the parameters in order to obtain a thicker or more liquid foam, or a different foam colour. Follow the instructions below for the correct adjustment:

- Adjust the delivery rate of the dosing pump at 50% of the maximum scale value.
- Adjust the compressed air pressure of the dosing pumps circuit at approx. 4 bar (in any case slightly higher than the pressure in the fresh water circuit).
- It is possible to adjust the physical characteristics of the foams in order to adapt them to the different applications, such as: distribution in a separate gantry run, distribution in front of the brushes, polish foam. These adjustments can be obtained by modifying following data of the relevant groups of parameters, through the UniOP programming device:
  - □ percentage of water
  - □ percentage of air
  - □ wash chemical pumping frequency.

- Start a washing program containing the foam cycle you want to modify and stop the machine using the “pause” key of the UniOp Operator’s Panel. Switch in manual mode “MAN” and adjust the relevant parameters, checking in real time the quality of the foam delivery (see UniOp manual).
- A perfect regulation should result in a continuous production foam, without any interruption (excess of air).
- An excess of chemical product can endanger the rinsing and the drying phases.

7.9.3.6 Wax nozzles

Scope

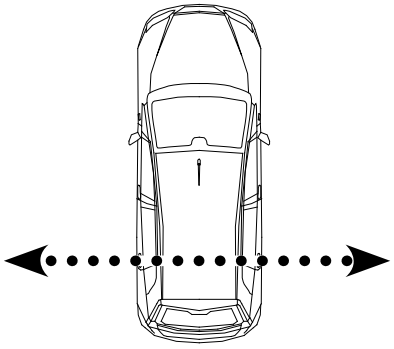
These nozzles are used for following functions:

- distribution of wax beyond the top brush (during brush wash backward runs);
- separate gantry wax run;
- distribution of wax during the drying forward run;
- separate gantry run with osmotic water;
- distribution of osmotic water during the drying forward run;
- rinsing

The water jets shall be perpendicular to the vehicles' surface, as shown on the drawing, and vertical.

Because of the special shape of the nozzles holes, the water jet comes out with an inclination of approx. 15°. Perpendicularity is obtained with a further 15° negative bending of the pipe.

Adjust the nozzles position to obtain the water jet shape as shown in the picture.



Adjustment of the position

To change and improve the direction, bend slightly and with care the nozzles support arms.

Turn the nozzles using a spanner and/or lift or lower the support arm to align the water jets with the vertical axis. The nozzles are screwed-in with teflon tape.

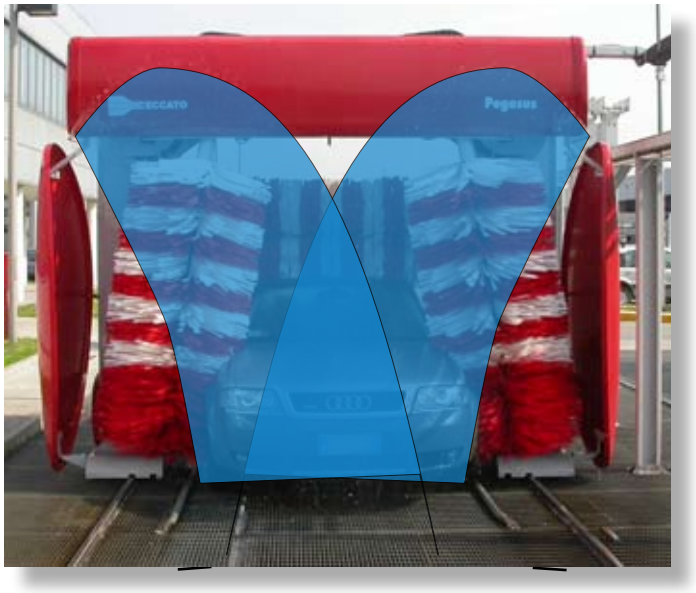
7.9.3.7 Rear nozzles

Scope

The nozzles can have following functions:

- Rinsing of the vehicles in forward run.
- Wetting of the surfaces before the side brushes in the backward runs.

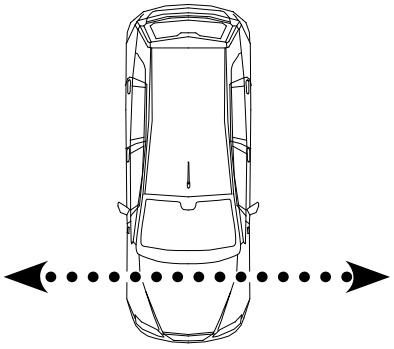
Adjust the pressure and delivery of the nozzles, so that the water jets shape is as shown in the picture.



Adjustment of the position

Turn the nozzle arm to have the water jet perpendicular to the vehicle's surface, as shown on the drawing, and vertical.

To modify the arch height, rotate slightly the nozzle using a spanner.



7.9.4 POLISH PRODUCTS NOZZLES – MAINTENANCE AND ADJUSTMENT

7.9.4.1 Types of polish chemicals

The polishing products can be of two types, with solvent or water base. The first ones are distributed through special nozzles where the product is mixed with air (fog nozzles). The second ones are distributed as a foam, using the standard nozzles.

7.9.4.2 Application of the nebulised products (Sonax or similar)

The photos at the side show the circuit for the application of the solvent based product. The nozzles (1) fitted on the gantry crossbeam cover the horizontal parts of the vehicle while those placed over the wheel wash units (2) are covering the vehicle's sides. The system operates with two independent dosing pumps for the distribution of the product, one for each working section.

The application cycle is carried out in the following way:

1. Brush wash.
2. Drying run to remove most of the water from the surfaces.
3. Application of the polish.
4. Gantry run with brushes to "massage" the polish, normally without water.
5. Gantry run with brushes and water to remove the excess of polish. In the same run, wax is distributed in order to optimise the following drying phase.
6. Drying cycle.

The solvent based polishing product is very volatile and light, it should therefore be used only with machines installed indoor and protected from the sun and air flows. It is important to avoid dispersion of the product and its early drying, as this would heavily influence the quality of the polishing process.

It should be avoided to distribute too much product, otherwise the successive rinsing and cleaning of the windows will be difficult

Adjustment of the nozzles position

The nozzles shall be regulated as shown in the figure. The jets coming out from the nozzles must be orthogonal with the vehicle's surface and at right angle with the gantry travel direction.

7.9.4.3 Polish foam application modality

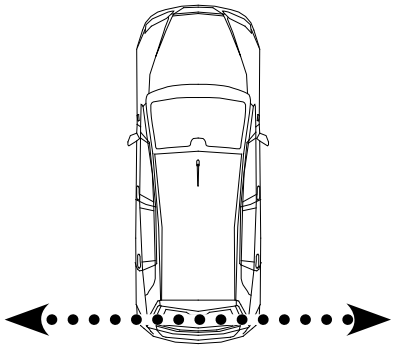
The polish foam is distributed through the normal foam circuit, using a specific dosing pump. The application cycle is as follows:

1. Brush wash.
2. Drying run (option).
3. Distribution of the product as a foam.
4. Gantry run with the brushes, normally without water and at low speed.
5. Gantry run with water (to take off part of the product in excess). Wax can be distributed in the same run to improve the successive drying phase.
6. Drying cycle.

Polish foam is a good alternative to the solvent-based product, mainly in outdoor installations where currents of air are possible.

Adjustment of the position

Follow the instructions for the shampoo nozzles adjustment.



7.9.5 ROBOWASH ADJUSTMENT

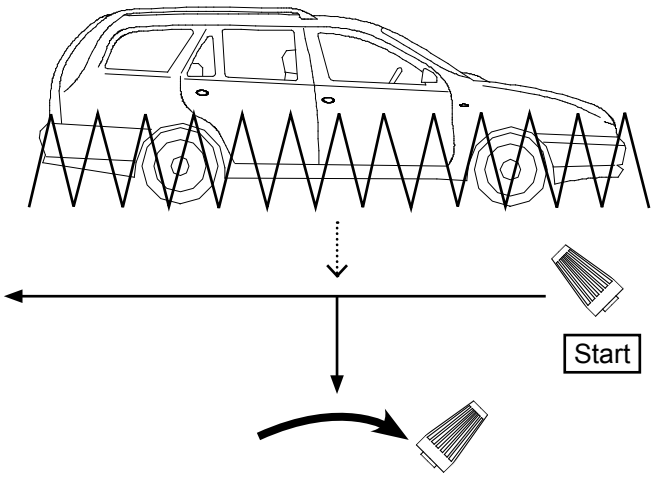
7.9.5.1 Scope of the device

The robowash device is specifically designed for the washing with high pressure (80-100 bar) of the lower part of the vehicle's sides, the rims, the wheels casings and the front and rear angles of the same vehicle. For technical information, see chapter 3.

Two operation modes are foreseen: complete and reduced washing.

7.9.5.2 Reduced operation

During "reduced" operation, the device will carry out a quick angular rotation in the middle of the vehicle while the gantry keeps running. This will happen both in the forward and backward runs.



Controls

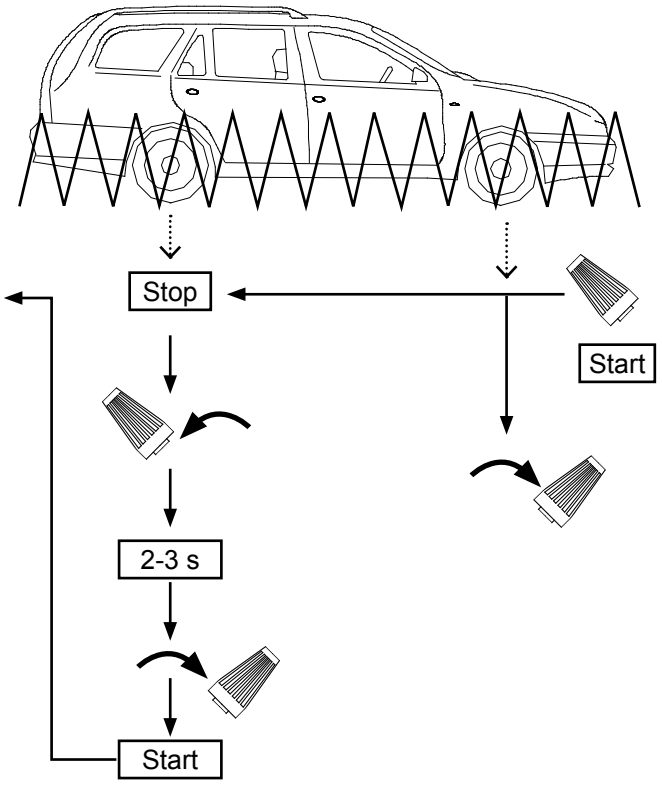
Check that the product spreading is uniform.

7.9.5.3 Complete operation

During "normal" operation, the device will carry out a quick angular rotation when it reaches the font wheels of the vehicle.

The same will happen when it reaches the rear wheels, but in this case the gantry will stop for 2-3 seconds (programmable time).

During the backward run, the device will operate in the "reduced" mode.



Controls

Check that the product spreading is uniform.

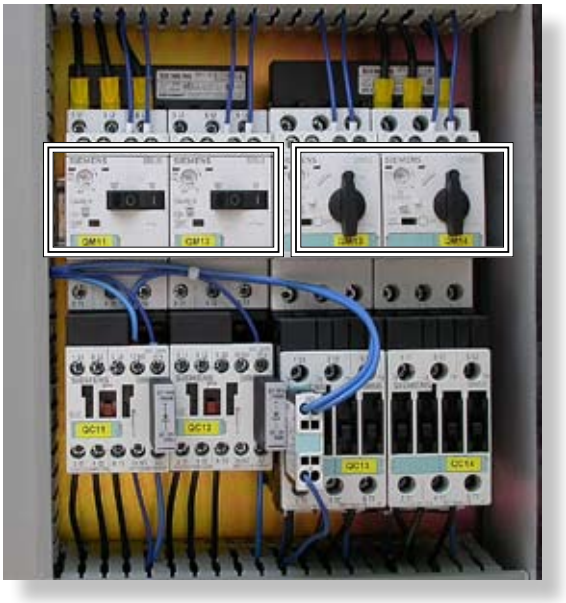
7.10 ELECTRIC SWITCHBOARD

7.10.1 RESET OF THE OVERLOAD SWITCHES IN THE ELECTRICAL CABINET

7.10.1.1 Preliminary note

Tripping of the protection overload switches may be caused by too high absorption of the relevant motor or short circuit. Call the Manufacturer or the authorised After Sale Service point if some overload switch is tripping too frequently or continuously.

! *Only authorised and trained persons are allowed to carry out this operation.*



7.10.1.2 Procedure

Follow the procedure described below to reset the electric protections.

1. Open the gantry left door using the key.
2. Turn the main switch to the position “0” (OFF), then open the door of the electric cabinet with the relevant key (the door cannot be opened if the switch is in position “I” (ON).
3. Find out which one of the protection switches has tripped and reset it following the instructions of the next paragraph.
4. Close the electric cabinet door.
5. Turn the washing unit main switch to the position “I” (ON).
6. Close the door of the left gantry column and switch on the machine.

7.10.1.3 How to locate and reset a tripped overload relay

Pivot switch

- When the overload relay is activated (tripping), the lever turns to “0”.
- Push the lever towards the position “I” to reset.

Rotating knob

- When the overload relay is activated (tripping), the knob turns to an intermediate position between “I” and “0”. This position may be marked “Trip”.
- To reset the switch, turn first the knob to position “0” and then to position “I”.

7.11 MAINTENANCE SCHEDULE TABLE

Schedule	Operation	Machine group	Procedure	Charge of
3 days after	Cleaning	Water manifold filters	See procedure par. 7.9.2	Site personnel
Every day	Checking	All safety and protection cut-off devices	See procedure par. 6.11	Site personnel
		All flexible hoses	Leakage check	Site personnel
Every week	Lubrication	Bearings of gantry wheels , Bearings of top brush and top dryer lifting shafts	See procedure par. 7.5	Site personnel
	Checking	Fastening of side brushes	See procedure par. 7.6.1	Site personnel
Every month	Checking	Side brushes, top brush	See procedure par. 7.6.3	Site personnel
	Checking	All transmission belts	See procedure par. 7.7	Site personnel
	Cleaning	Water manifold filter	See procedure par. 7.9.2	Site personnel
	Checking	Nozzles	See procedure par. 7.9.3	Site personnel
	Checking	Top brush sliding guide	See procedure par. 7.8.3	Site personnel
	Checking	Motorgear boxes	See procedure par. 7.8.2	Site personnel
	Lubrication	Joints of the blowing nozzles oscillating bars	See procedure par. 7.5.2.3	Site personnel
Every six months or **every 5000 washes**	Checking	Dosing pumps	See procedure par. 7.9.1	Site personnel
			Check for leakage, Clean the bottom filter, Check the suction and delivery valves	After Sale Service
Every year or **every 7500 washes**	Checking	Plastic rollers of the side brushes trolleys, top dryer, top brush and wheel wash group.	See procedure par. 7.8.3-4-5 Check the condition of the rollers and the clearance between the rollers and the guides.	Site personnel/ After Sale Service
		Rubber stop-blocks.	See procedure par. 7.8.7	Site personnel
Every 15000 washes or **Every 2 years**	Replacing	All transmission belts		After Sale Service
	Replacing	Replace the dosing pumps suction and delivery valves	Replace the valves *Note: the time interval may vary, depending on the characteristics of the wash chemicals used.*	After Sale Service

7.12 MACHINE OUT OF OPERATION

If the washing unit needs to be put out of operation for a long period:

1. Fill up the chemical products cans with water and start the unit for some complete washing cycles; repeat the operation with completely empty cans. In this way the pumps and the chemical products distribution system is complete washed and emptied out.
2. Empty out all the water pipes of the unit, opening the manual frost protection cocks. Start the automatic frost protection cycle if the machine is equipped with the device.
3. Cut off the power supply of the washing unit by switching off the isolator switch at the beginning of the power supply line. Cut off the connections of water and air pressure. Make sure that, while the unit is out of operation, the line isolator switch cannot be reinserted by non authorised personnel.
4. Carry out a general lubrication of the unit (chains, joints, rods of pneumatic cylinders, etc.), using water-repellent grease.
5. Protect the brushes from direct sun rays and from weather agents, covering them with waterproof non transparent cloths.

Compliance with above instructions will result in advantage to the user who, when starting again the unit will find it in good conditions.

As for the new starting of the unit, contact the After Sale Service of the manufacturer.

7.13 DIAGNOSTIC

PROBLEMS	CAUSES	SOLUTIONS
With the key switch of the control panel switched on, the wash cycle does not start when pressing the start button	The door-lock switch is in position «0»:	Put the door-lock in position «1»
	No power supply:	Make sure that the circuit breaker at the beginning of the power supply line of the unit is switched on.
	Gantry out of position:	Reposition the unit.
	Tripping of an automatic switch or overload relay in the electric switchboard	Reset the switch. See procedure par. 7.10.1
At the end of the water or wash chemical delivery phases, water still comes out from the nozzles	The solenoid valves are dirty, stuck or faulty:	Call the Manufacturer's After Sale Service.
The water delivered from the nozzles is not enough	The water pump supplying the unit is running dry or has been deactivated	Make sure there is enough water in the accumulation tank; prime the pump if necessary; check the bottom suction valve
	Dirty nozzles:	Clean the nozzles.
	The solenoid valves are stuck or faulty:	Call the Manufacturer's After Sale Service.
The wheel wash does not work	Dirty photocells:	Clean the photocells.
	The photocells are not lined or there is an electric fault:	Call the Manufacturer's After Sale Service.
After the wheel wash, the gantry does not move forward because the wheel wash equipment is not back in position	The wheel wash solenoid valves or the guide rollers are out of order:	Call the Manufacturer's After Sale Service.
The washing effect is not enough	Not enough cleaner or low quality cleaner:	Increase the cleaner production, use better quality cleaners.
	Worn out brushes:	Change the brushes.
	Working pressure of the brushes on the vehicle not enough:	Call the Manufacturer's After Sale Service.
The drying result is not satisfying	Not enough wax or low quality wax:	Increase the wax delivery, use a better quality product.
	Water too hard:	Install a water softening system.
The foam effect is not enough marked	Not enough foam or low quality product:	Increase the foam delivery, use better quality foam.
	Foam production to be optimised:	Optimise the foam effect – see chapter 7 for the adjustment».
The reader indicator is green and the card is not accepted	The card has been inserted wrongly:	Re-insert the card.
	Reader's internal sensors are out of order:	Call the Manufacturer's After Sale Service.
The card is accepted and falls inside the reader, but the green indicator keeps on and the unit does not start.	Reader's inside sensors are out of order:	Call the Manufacturer's After Sale Service.

CHAPTER 8

Appendices

8.1 CARDS FOR “COMMENTS ON THE TECHNICAL ASSISTANCE INTERVENTIONS”

Date	No Washings	Intervention description	Technician / Address	Segnature technician

Date	No Washings	Intervention description	Technician / Address	Segnature technician

8.2 NORMATIVE AND LEGAL REFERENCES

- Machine Directive 98/37/CE
- Directive 2006/95/CE Low Voltage
- Directive 2004/108/CE Electromagnetic compatibility
- UNI EN ISO 12100-1 - 2006: Safety of Machinery. “Basic concepts – General project principles - Terminology, basic methods”.
- UNI EN ISO 12100-2 - 2006: Safety of Machinery. “Basic concepts – General project principles - Terminology, basic methods.
- UNI EN 60204-1 – 2006: Safety of Machinery. “Equipment of machines”.
- UNI EN 294 - 1992: Safety of Machinery. “Safety distances to avoid collision of upper limbs with dangerous zones”.
- CEI EN 60079 - 10 : Optimal environmental conditions for the installation of the machine. “Classification of dangerous sites due to presence of gas”.
- CEI EN 61241 - 14 : Optimal environmental conditions for the installation of the machine. “Electrical devices to be used in the presence of combustible dust”.
- CEI EN 61241 - 17: 2006-05 : Optimal environmental conditions for the installation of the machine. “Control and maintenance of electrical systems in sites with explosion danger”.
- In Italy: D.LGS. 626/94: Worker safety and health protection in the workplace.
- In Italy: Law 46 of 5.3.90: Safety of the machines.
- In Italy: D.P.R. 447 of 6.12.91, Enforcement Regulations of the law 46 of 5.3.90: Safety of the machines. “Technical-professional Requirements - Certificate of acknowledgment of technical-professional requirements”
- In Italy: D.LGS. 152/06 part 3, section 2: Water protection from pollution. “Discipline of water draining”.

8.3 PROGRAMMING SHEET FOR HYDRUS

Original sheet to copy

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Programming Form - HYDRUS Unit

Model	Brushes	H.P.	M.P.	Mult	L.Ch	PCch	Pol.	Osm

Program N°		Address			
		Author		Date	
Description				Time	

Function			Run											
group	parameter	No	1	2	3	4	5	6	7	8	9	10	11	12
BRUSHES	Activation	1												
	No Water	2												
TOP BRUSH	Reverse	3												
	Pick-up	4												
SIDE BRUSHES	Overlapping	5												
	Tilt	6												
SHAMPOO	Product 1	7												
	Product 2	8												
	Insect cleaner	9												
	Central arches	10												
	Front arches	11												
	Air for central	12												
	Air for front	13												
WHEEL WASH	Activate	14												
	Chemical	15												
WAX	Wax 1	16												
	Wax 2	17												
	Hot water	18												
	Osmose water	19												
	Air	20												
PREWASH CLEANER	Side	21												
	Hot water	22												
HIGH/MEDIUM PRESSURE	Side	23												
	Top	24												
	Robowash / Triwash	25												
	Chassis wash	26												
POLISH/ HARD	Activate	27												
DRYING	Activate	28												
SPEED	Speed (Hz)	29												
	Next run delay (s.)	30												

CHAPTER 9

Enclosures

To know the type of the documents enclosed to this maintenance manual, see chap. 1 par. 1.1.5.

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