Instruction manual

High-Pressure Equipment

BKF CarWash

This instruction manual serves as a warranty book and should be presented to a service technician during the inspection.

⚠️ Read this instruction manual before using the equipment!
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**Important information**
To whom this instruction manual may concern. This document should be read by:

- A designer of a complex where the equipment will be used
- Installers assembling and starting-up the equipment
- Equipment users
- Equipment service technicians

**Used symbols**
The following symbols are used in this instruction manual:

- 👀 Key information to proper assembly and operation of the equipment
- ⚠️ Information relevant to safety of people and environmental protection
- ⚡ Risk of electric shock
- 🔥 Risk of burning

**General guidelines**

- Before using the equipment read carefully this instruction manual, all the appendices and sub-assemblies instruction manuals constituting appendices to this document.
- Any changes must not be added to the equipment without written permit of the producer.
- The equipment shall be installed and service exclusively by authorized installer or service technician.
- The equipment installed inconsistently with this instruction manual may constitute danger to its users and to the environment.
- To ensure long, safe and proper exploitation period, the equipment must undergo quarterly inspections conducted by an authorized service centre.
- In case of operational malfunctioning of the equipment, please contact an authorized service centre.
- Used and damaged parts must be replaced with original spare parts provided by the manufacturer.

**Guidelines concerning high pressure**

- Never use the equipment without supervision.
- Coming out water stream may be dangerous. Therefore, do not direct it towards people, animals, electrical equipment or to the car wash itself.
- Do not direct water stream towards plug-in sockets.
- Inner parts of the equipment, metal parts of a gun and injector are hot in operation with hot water.
- At all times of operation keep the door of the equipment shut and do not touch metal parts of an injector.
- Children must not operate high-pressure washing equipment.
- Do not pull high-pressure hose when it has loops or is broken. Pay attention not to damage the hose with sharp edges.
- Staff members and customers using the equipment must wear protective clothing for example waterproof uniform, rubber shoes, protective glasses, headgear. The user operating the equipment without sufficient protective clothing does it at their own risk.
- High-pressure stream may produce a high level of noise. If the noise level exceeds permissible value, users and people in close proximity must wear appropriate earmuffs.
- Coming out high-pressure stream produces recoil and additionally turning moment due to a deviated injector. Therefore, keep a gun tightly with both hands.
- Do not block out the lever of a gun during operating. After each use, put a safety interlock on a gun to prevent uncontrolled water spurt.
- Do not use the equipment to wash materials containing asbestos or other dangerous for health substances.
- Never use cleaning agents containing solvents such as varnish thinner, gasoline, oil or similar liquids. Follow and take into consideration all information provided by additives manufacturers! The equipment gaskets are not solvent-proof! Sprayed solvents are flammable, explosive and toxic.
- The machine must not be set and exploited in rooms prone to fire or explosion. The equipment must not be used under water.

Guidelines concerning electricity and gas

- Shut power supply and close gas valve before the performance of service and maintenance activities.
- Activities concerning electricity and gas shall be performed exclusively by authorized persons.
- Gas pressure should be consistent with requirements stated in an instruction manual of a boiler attached to the equipment. The failure to maintain the parameters may result in boiler malfunctioning or even its damage.
- Electrical installation should be free from any kind of voltage drop. Voltage differences between particular phases or their drops prevent the equipment from proper operation.

Guidelines concerning water supply

- Actual water pressure during maximum work load of the equipment cannot drop below 3bar!
- Maximum momentary supply pressure amounts to 6bar.
- It is advised to install hydrophore set or a pump increasing the pressure up to the volume recommended in case of too low supply pressure.
• Car wash supply water should match the parameters of potable water.

⚠️ Application of water which does not match the parameters of potable water may result in loss of warranty on components of water processing system such as softener and osmosis.
• Chlorine, suspension, iron and other compounds concentration exceeding norms may result in damages.
• Too low supply pressure may cause permanent damages of car wash parts which will not be covered by a warranty.

Warnings

If you smell GAS

• Cut off gas supply immediately
• Open all the equipment doors, if applicable
• If the equipment is situated indoors, open the windows and the doors for better ventilation
• Contact your gas supplier and/or installer immediately

This documentation constitutes an integral part of the equipment and must be hand over to a user along with the equipment. Keep this documentation in a safe place.

Installations, inspections, repair and maintenance services can be exclusively conducted by an authorized service centre, according to regulations as in force at present.

BKF Sp. z o.o. shall not be held responsible for the damages resulting from the exploitation of the equipment contrary to its intended use and instruction manual.

恓 The producer reserves the right to introduce construction changes aiming at the equipment improvements without any prior notice.
Description of equipment
Specifications

BKF CarWash is comprehensive cleaning equipment used to vehicle washing.

Basic components of the BKF CarWash equipment:

- High-pressure pumps
- Boiler with a tank (type: Tank-in-Tank ACV)
- Double column water softener with high flow rate
- High-efficiency system for Reversed Osmosis
- Corrosion resistant and stainless steel frame
- Demineralized water tank
- Control computer with the Internet supervision option
- Precise installation dosing chemical agents

Technical data

The following chart shows technical data of BKF CarWash equipment of modular 2-stand and 4, 5 and 6 program types. Technical data on softener and boiler is included in instruction manuals of these pieces of equipment which constitute an appendix to this document.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>3 x 380-400, N, PE, 3 AC V/50Hz</td>
</tr>
<tr>
<td>Coins accepted</td>
<td>1, 2, 5 and tokens (option of setting other coins or different currencies)</td>
</tr>
<tr>
<td>Max water flow rate</td>
<td>N¹ x 11 l/min</td>
</tr>
<tr>
<td>Max Pressure</td>
<td>120 bar</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>30 – 125 bar</td>
</tr>
<tr>
<td>The temperature of supply water</td>
<td>20 – 49°</td>
</tr>
<tr>
<td>Actual supply water pressure required</td>
<td>3 – 6 bar</td>
</tr>
<tr>
<td>Ion-exchange capacity of softener (one column)</td>
<td>2 x 160 m³ x ⁰dH</td>
</tr>
<tr>
<td>Efficiency of Reversed Osmosis system</td>
<td>300 l/h</td>
</tr>
<tr>
<td>The capacity of permeate flow tank (osmosis)</td>
<td>750 l</td>
</tr>
<tr>
<td>Water supply outlet</td>
<td>1” internal thread (IG)</td>
</tr>
<tr>
<td>Water consumption in reversed osmosis</td>
<td>2,3 st 400 - 600 l/h, 4,5,6 st 800-1200 l/h</td>
</tr>
<tr>
<td>Reversed osmosis water production</td>
<td>2,3 st 200 - 300 l/h, 4,5,6 st 400-600 l/h</td>
</tr>
</tbody>
</table>

¹ N – number of stands
Application

High-pressure (non-contact) wash enables washing vehicles of irregular shapes for example motorbikes, etc. without the necessity to disassemble sticking out elements such as mirrors or antennas. Softened under high-pressure (up to 125bar) water in combination with a gentle washing agent does not leave any marks on varnish. Polymer protection and rinsing with demineralized water makes the varnish looks new for many years.

Non-contact CarWash has been designed for self-service washing of vehicles such as:

- motor cars,
- mini vans,
- motorbikes,
- hatchback cars

and other vehicles with their surface dimension close to the abovementioned examples.

Option of an external stand enables washing lorry (up to 3.5m).

The advantages of equipment

- water softening
- quick and easy everyday care
- low chemical agents, water and electrical energy consumption
- does not scratch varnish
- does not need drying

Principles of operation

Stationary self-service car wash is fully automatic, widely available equipment used for washing cars. Industrial computer is used to control washing process, dosing cleaning and preservative agents, heating up water, calculation of fees and running selected programs.

A high-pressure pump producing operating water pressure between 30 and 125bar is a basic sub-assembly used in the equipment. Pump electrical motor is powered by tree-phase system. Water, along with cleaning agents, is supplied by high-pressure pipe system under high pressure outside a car wash and through a lance directed towards a washed vehicle.

Washing of a car surface is quick and efficient because high-pressure nozzle, fitted at the end of a lance, forms a water stream into a trowel shape. Low-pressure boiler for heating up water is a piece of equipment fostering the efficiency of washing. The boiler for heating up water is equipped with a burner and powered (depending on a type) by natural or liquid gas or by fuel oil.

Water used for washing is processed by softening and purifying in the so called process of reversed osmosis. Water processing is aimed at its purification from mechanical pollutants and minerals. Owing to this process, we increase the efficiency of chemical agents and we prevent the surface of a washed car from water stains.

Chemical agents used in a washing process are dosed with computer supervision and with the help of dosing pumps or injectors. Application of agents recommended by BKF CarWash Company guarantees the maintenance of high quality services and proper working of the equipment.
The equipment also has anti-frost system. It operates on the basis of forced water circulation. When the ambient temperature drops below 3ºC (which can be changed in a computer), thermostat situated outside a car wash activates anti-frost system which prevents water from freezing inside the car wash installation and defrosts the ground in the area of lance operation.

It should be taken into consideration that recommended operation temperature equals to a minimum of -7ºC!

CarWash operates with the help of the most modern car wash technology basing on five or six programs, selected by pressing an appropriate button on a control panel.

- Wheel -rims spray – washing off brake pads traces from rims
- Turbo spray – with active foam
- Powder washing – with powder and hot softened water
- Rinsing – with cold water from installation
- Polymer coating – wax and softened water preservation
- Refinishing and drying – with cold demineralized water with refinisher

Equipment design
BKF CarWash equipment, depending on model, consists of either two modules or one technology placed in a frame.
In case of a modular type, it consists of:

- A Module with installations responsible for chemical agents dosing, high-pressure installations, a board and a control computer, floor and water heating installation
- An Aqua Clean with installation of water purification, a demineralized water tank, circulation installation

In case of a technology car wash, all sets of devices, a control unit and hydraulic elements are placed in a frame, next to which a boiler and softener are set. There is also a type of a car wash situated into a container by the manufacturer, the layout of which is identical to a technology car wash.
Design of car wash parts

**High-pressure system**

High-pressure system consists of:

- High pressure washer

  o A pump type CAT 1140, 340 or other, depending on a car wash type
  o A coupler connecting a motor with a pump
  o An electric motor

- Pressure regulator, depending on model, equipped with:
  o Bypass micro-switch
- Without a bypass switch

- High pressure hoses supplying water to wash stands
- Rotating booms above wash stands
  - Straight arm type
  - Curved arm type (Z – style)
• Guns, depending on installed valves:
  
  o Permanentweep – version of a gun streaming water after releasing the sensor (as long as wash credits are active)

  o noweep – version of a gun not streaming water after releasing the sensor (as long as wash credits are active). The gun is equipped with a protection against streaming low-pressure water.

• High-pressure nozzle – the size and type of a nozzle depends on a car wash type
Chemical agents dosing system

BKF CarWash equipments have two types of chemical agent dispensers. The first one is a powder chemical agent dispenser and the second one is a liquid chemical agent dispenser.

Powder dispenser

Mixrite dispenser

The first type is used for powder dosing during “main wash” program, the second one is used in other programs.

Chemical concentrates used in equipment may affect health. Follow all the rules specified on a chemical agent package when using it.
Open circuit
Water from boiler open circuit is used in the equipment for washing programs and car maintenance. Elements constituting open circuit are showed and described in appropriate lay-outs constituting an appendix to this instruction manual.

Closed circuit
Boiler closed circuit is used to heat the floor and, in some car washes, to heat a car wash itself. Elements constituting closed/open (?) circuit are showed and described in appropriate lay-outs constituting an appendix to this instruction manual.

Installation of softened and osmotic water
The equipment has a softener and a reversed osmosis station. The softener is responsible for the production of softened water which fosters chemical agents. Osmotic station produces water with parameters close to the ones of distilled water. Running the program of osmotic water rinsing prevents washed surfaces from water stains caused by minerals.
Assembly

Preliminary conditions

For proper assembly of the equipment the particular connection conditions must be met. These conditions are specified in the utilities chart which constitutes the appendix to this instruction manual.

Utilities such as water, electricity, gas, heating oil and other must be connected in an appropriate setting specified in the assembly lay-out which constitutes the appendix to this instruction manual.

Assembly

Warning: Washing equipment must be assembled exclusively by authorized service technician of BKF CarWash Sp. z o.o. in accordance with national standards and regulations as in force at present.

Read carefully this instruction manual, all its appendices, and instruction manuals of sub-assemblies, which constitute the appendix to this document, before the assembly of the equipment.

Before the arrival of the assembly team and the equipment, the investor is obliged to send a “ready to assembly form” in which he confirms that the site is ready for the equipment assembly. Access to all utilities (electricity, water, gas or oil) is necessary during the time of assembly. The assembly and commissioning will not be possible without active utilities.

Step 1 – unpacking the equipment

The equipment should be unpacked and checked at the site of assembly. If any of the parts is missing, contact the supplier.

Step 2 – equipment setting

The unpacked equipment should be set in a target place specified in a construction design or in assembly guidelines.

Step 3 – connecting the utilities

Before assembly, make sure that the main electricity switch has been switched off and a supply cable is not live!

Assembly shall be performed exclusively by a person holding appropriate licenses of competence!

Proceed to utilities connection after setting the equipment.

Electricity connection
Electricity should be connected to a connection box situated below a control unit.

Water connection
Water should be connected to the equipment with the use of an elastic hose with a steel braiding 1”. After the connection, check water tightness and make sure that water parameters, including the pressure and flow rate, have reached a level demanded.
Sewage connection
Sewage pipe should be connected to:

- Overflow installation of circulation tank
- Installation of water catchment from safety valves
- Softener rinsing head

Circulation installation
Circulation tank should be connected to:

- Osmosis head
- Gun handles head
- Float valve filling up water

Gas connection
¾" nipple (which is delivered along with the equipment) should be screwed in to gas connection and burner plug. Next, the nipples should be connected with gas hose (which is delivered along with the equipment).

The assembly of installations must be exclusively performed by qualified personnel. Check installation tightness before starting up a boiler. Additionally, the installation must be commissioned by a gas supplier!

Oil connection
A supply line must be connected with the use of a cutting ring and an oil filter nut which is located on a boiler casing. A return line should be connected to a return hose of an oil burner with the use of a nipple, a cutting ring and a nut. All parts are delivered by the equipment supplier.

Chimney connection
Fasten together all components with hose clamps to assemble a chimney. All parts constituting standard equipment are listed in the chapter “Standard Equipment”.

Passages through a roof and walls should be protected with special foam and panels. One set of panels (for one passage) is included in a standard version of the equipment. Foam is not included in the equipment.

Step 4 – installation of high pressure
Firstly, rotating booms should be fixed in particular stands. A boom should have a ¼” GZ ⅜” GW expansion joint should be screwed in a boom from the side of the equipment. ⅜”nipple should be screwed in an expansion joint. A swivel should be fixed at the side of an arm. All components are provided along with the equipment.

After fixing the booms, hoses should be fixed between the equipment and the boom. A hose should be fixed into high-pressure system in the equipment and to a nipple fixed to a boom.

All thread connections should be appropriately sealed.

High pressure hoses should be set in trays or in handles, depending on the assembly setting. Hoses should be tight and secured against movements so they do not wear through.
Step 5 – connecting the electrical and module control installations

Cables should be led into a control unit and connected in accordance with an appendix “Clamp List”. Dusk and outdoors temperature sensors should be lead from a control unit.

Dusk sensor should be located in such a position so artificial light does not interfere with it!

Temperature sensor should be located in such a position so stream of water does not interfere with it. 3-5 meters above floor level is an advised location.

Start-up

Step 1 – checking installation tightness

Open water and filter valves and vent filters after connection of the equipment. In the course of filling up the installation, open the vent valve so that the air is pushed out from the installation. After filling up the installation, open the valves of particular stands and of chemical agents dosing installation. After opening the valves check if water drips from the guns - it is a circulation system which is activated when power supply is off. Power supply can be switched on after deaeration.

Step 2 – filling up the installation of heating circuit

Heating circuit is always filled up as a second one! It should be filled up with water in 50% and next with 50% glycol or ready-made 50% glycol solution. To fill up the installation with water use water supply valve; use external pump connected to the third circuit of heating installation splitters to fill up the installation with glycol.

There must be no air in the circuit for proper working of floor heating! All air must be removed during the process of filling up the installation.

Step 3 – softener and osmosis settings

Softener and osmosis should be set in accordance with regulations included in instruction manuals of the above equipment.

Step 4 – boiler commissioning

Boiler commissioning should be performed in accordance with the guidelines described in the instruction manual of a boiler! The commissioning should be performed exclusively by an authorized service technician, by a manufacturer or by a car wash service centre which is a holder of a boiler manufacturer authorization.

Step 5 – car wash settings

The following installations and elements should be set after completing the abovementioned activities.

- Water temperature in a boiler
- Utility water temperature
- The quantity of dosed liquid agents
- The quantity of dosed powder
- The level of switching on the permanent lighting
- The temperature of switching on the floor heating
- The temperature of switching on the circulation installation
- Fees for particular programs
• The pressure of pumps work
• The reducer of circulation pressure
• The reducer of pressure in softened water installation
• Procedures for setting changes are listed in the chapter “Exploitation and maintenance”.

**Step 6 – tests**

After car wash setting and commissioning, the following tests on proper working should be conducted:

• Tightness test of internal installation
• Tightness test of high-pressure installation
• Test on proper working of a car wash

After conducting the tests, an assembly technician fills in a protocol of a car wash commissioning which must be signed by a person authorized to accept a car wash as an owner. Additionally, an assembly technician conducts training for car wash staff members (which is confirmed with an appropriate document).

⚠️

All necessary acceptances and measurements should be conducted after assembly and connection of the equipment. These activities shall be conducted by institutions or persons holding appropriate licenses of competence. The owner of the equipment is responsible for contracting and conducting the measurements.
Exploitation and maintenance

Activities connected with exploitation and maintenance are performed by trained personnel of a car wash or for remuneration on the client request by a service center. A car wash, as industrial equipment, requires regular maintenance and replacement of consumable parts. These activities should be performed in due and timely manner, works performed by car wash personnel should be entered into an appropriate protocol and should be kept available to BKF CarWash workers.

BKF CarWash Sp. z o.o. offers service packages with the most popular consumables parts which are suitable for each car wash type. The purchase of a package allows the owner to operate a car wash with no interruptions.

The following parts should be monitored and replaced, if such needs, at the course of car wash exploitation.

- Replacement of high-pressure nozzles,
- replacement of a gun, gun valves, lances and nozzles guards,
- replacement of high-pressure cables and unions of the boom (straight and angle spinner),
- replacement of program selection buttons, button covers, light bulbs,
- replacement of a protective flap of coins acceptor and doors handle
- cleaning coin acceptor,
- oil replacement in high-pressure pumps,
- cleaning circulation tank,
- cleaning chemical agents dosing system,

The abovementioned activities may be performed by an authorized service centre for remuneration.

The owner of a car wash is obliged to present BKF CarWash service technician with a rapport on work hours of each car wash in the course of valid warranty. Degree of consumption of consumables parts is calculated on the above basis.

In case when the number of work hours is not available, the decision if a defect results from exploitation or is a production fault is taken by a factory service centre of a producer.

Control of the condition of expandable materials

Chemical cleaning agents

Chemical agents should be replenished regularly. Consumption time for particular chemical agents depends on setting of dosing parameters and work load of a car wash. In case a particular chemical agent is completely used, after providing a new container, dosing pumps will dose chemical agents after pushing out air from dosing system which can take a couple of minutes.

Using chemical agents with parameters different from those recommended by a manufacturer may result in a damage of car wash elements and in a loss of warranty. Therefore, it is strongly recommended to use chemical agents offered by BKF CarWash Sp. z o.o.

Recommended chemical agents and their concentration

<table>
<thead>
<tr>
<th>Program</th>
<th>Chemical agent</th>
<th>Recommended concentration</th>
</tr>
</thead>
</table>

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Water processing
Put 25 to 50kg of pure NaCl salt in tablets into a container. The level of salt must be controlled regularly. The container should be filled with tablets above water table. Make sure that there is always salt in the container. The level in the container should be periodically controlled (visual control). The frequency of level control is defined on the basis of the observations results of a car wash operation within a couple of months.

Everyday activities
It is advised to empty coin boxes everyday for security reasons. Everyday activities also include checking the levels of chemical agents and performing activities accordingly with Routine Exploitation Activities Chart which is an integral part of this instruction manual.

Weekly activities
Filters cleaning and replacement
The condition of water filters in the equipment should be controlled in a weekly cycle. Dirty and clogged filters should be cleaned or replaced with new ones depending on their type. In case of high exploitation level or using water with not correct parameters, the activity of filter replacement should be performed more often than once a week (depending on the degree of soil). In case of a high degree of pipe water soil, contact a factory service center immediately and provide appropriate bodies with a sample of water for conducting thorough analysis on water components. Water with a high level of iron, chlorine, calcium and manganese influences negatively the lifespan of an osmosis membrane (the lifespan of such a filter decreases significantly).

The list of filters to be checked and cleaned:

- Collector filters
- Entry filter (10” 50 microns)
- Osmosis filter (10” 1 micron)
- Osmosis filter (20” 5 microns)
- Gas or oil filter

Control and adjustment of softener settings
Controls of water hardness should be conducted at the end of a column work cycle.

- It is advised that a car wash personnel check water hardness “after softener” min. 2 times a week.
- Hardness of softened water should not exceed 1° dH.
- Adjust softener settings in accordance with instruction manual of a softener in case of its improper work.
- Check regularly salt level in a brine container (recommended constant level of salt in a container amounts to ¾ of a container).
To small quantity of salt may contribute to poor degree of regeneration of a softener bottle which consequently may increase the hardness of water with softener. In case of hardness higher than 1° dH, check connection of a softener head and a brine container (a cable which connects them could be disconnected). Also check water level in a brine container. If there is no water or water level is too low in a brine container, fill it with water up to recommended level and switch on regeneration of a softener bottle.

Water hardness exceeding 1° dH causes permanent damages of a membrane and drastic decrease of its efficiency. Membrane damages caused by the lack of softener settings adjustments are not included in the warranty!

Regeneration of softener will not proceed if there are interruptions in water or electricity supply. Conduct a test of water hardness “after softener” in case of lack of water or electricity and after resumption of these utilities. Switch on softener regeneration manually in case of water hardness exceeding 1° dH. Perform regeneration of both bottles in case of double-column softeners. Conduct a test of water hardness one more time after performing the regeneration.

Control and adjustment of osmosis settings

Reversed osmosis system should work producing 1/2 of waste and 1/2 of product.

- The increase of product quantity may result in a permanent damage of a membrane.
- The measurement of product and waste is performed with the use of rotameters on reversed osmosis installation.
- The level of osmosis waste must not be lower than 1/3 of product!

Recommended work parameters

- For osmosis with efficiency of 300 l/h at 16 st°
  Product: 200 - 300l/h, waste: 120 – 150l/h +/- 10%
- For osmosis with efficiency of 600 l/h at 16 st°
  Product: 450 - 600l/h, waste: 250 - 300l/h +/- 10%

Depending on water quality, and with time lapse, a membrane may get clogged with calcium compound, colloidal and mechanical impurities. Along with efficiency drop, the ratio of waste to product may increase which may lead to total clogging of membrane and, as a result, the necessity of its replacement.

The reading of water conductance is displayed in a conductance meter located on a control unit doors. Water conductance should not exceed 50ms. The value of water conductance may vary depending on quality and temperature of water.
Oil level in a high-pressure pump

Make sure that a pump is not working before checking the level of operating oil in a high-pressure pump. Operations in a car wash should be stopped for the time of a control.

Oil level in a pump is checked with the help of viewfinder located in CAT pump. The upmost point of a red dot marks the maximum level of oil, whereas its lowest point marks the minimum level of oil. The level of oil in a pump must fit this span.

Fill a pump with oil recommended by a producer in case of too low level of oil in a pump.

The exploitation of a pump with either too high or too low level of oil may cause its damage!

Replacement of oil in a pump

Oil in pumps should be replaced every 250 work hours but at least every two months!

Oil with milky coloring may indicate that it contains water particles. Replace oil in a pump immediately in such case. Call authorized service centre in order to replace sealers if the situation repeats.

In case of CAT 300 pump types (340 and 350); each floater should be sprinkled with oil once a month (3 drops per floater). Drops are applied through special holes cut in a pump trunk.

Impurities, damages and operation control of mechanical elements

The following mechanical elements and sub-assemblies require cleanliness and efficiency control:

Construction elements of a car wash pits, i.e. umbrella roof, a control unit, roof, control indicators and elements, high-pressure hoses, lances, guns, chimney, etc. The elements the condition of which should be checked:

- rotating joints concerning tightness,
- guns tightness,
- the condition of rubber covers on buttons and nozzle covers
- the condition of high-pressure nozzle
- high-pressure pumps (if they do not leak and work smoothly)
- checking softener head
- checking boiler operation (if it works)
- tightness of solenoid valve
- cleanliness of a coin collector (wipe it with pure spirit only)
- inside of a control unit (visual control).

It is forbidden to use aggressive cleaning agents to remove impurities from a car wash.
Dirty mechanical elements should be cleaned with water. If there is such a need, use some soft cleaning agent.

Additionally, in winter season, i.e. from 31 X to 30 IV, activities aiming at thorough checking should be performed:

The condition of a circulation tank (a circulation tank should be cleaned so it does not contain sand and other impurities which may damage circulation system. Additionally, water level in a container should be checked. If the level is too low, fill the container with water. In case there is no water in a circulation container, circulation system stops working properly which may lead to damage of a circulation pump and frosting of high-pressure cables in a car wash. If there is no water in a circulation tank, switch off a circulation pump immediately, next fill a circulation container with water and flood a circulation pump with water. Switch on a circulation pump again. If high-pressure cables freeze, switch off a circulation pump and then disconnect high-pressure cables in order to defrost them).

Functioning of a circulation system at all stands of a car wash (check if all guns have winter valves which enables low-pressure water flow). In case of severe winter, constant control of a circulation system is recommended (it is advised to flow warm water through high-pressure hoses – selecting a wash program).

Work of circulation system pump (pump should operate with a pressure of approximately 3 – 3.5 bar).

In case of active credits at the stand and when a customer is not washing a car (so a gun trigger is not pulled) then this particular stand may freeze within 2 to 3 minutes at extremely low temperatures. Using valves in a gun type permanent weep (they allow constant flow of water) is a good solution to this problem.

Check the degree of switching on heating floor system and circulation system – it should not be lower than 3°C. In case of freezing floor, increase the temperature of concrete floor heating (adjusting valve which regulate temperature is located in the back of ACV boiler).

Functioning of thermo fans heating car wash modules (a car wash personnel is responsible for placing and switching on electric heaters. In case of container car washes, switch on a heater in a container).

Functioning of ACV boiler (checks if a boiler works; check the pressure on a manometer of floor circulation – the range between 1-2bar. If the pressure fits within the range and a boiler is working properly, check whether floor heating works properly, i.e. whether a concrete slab of a car wash warms up evenly)

The level of heating oil or propane/butane gas (make sure a car wash does not run out of any of these utilities in winter season. In case of a break in a boiler operating, key elements of a car wash may get damaged).

Live elements and sub-assemblies situated inside a control unit; lighting, etc. may be maintained and repaired exclusively by an authorized service centre.

Exploitation guidelines for car wash owners
It should be highlighted that a car wash is industrial equipment, functioning in difficult conditions and with a heavy work load, and therefore the consumption of consumables elements and damages being the results of the above-mentioned factors may occur. In order to avoid any interruptions in a car wash operation, it is advised to undergo periodical inspections of a car wash. An inspection aims at checking the condition of equipment and which consumable elements must be replaced and which ones may still operate. Additionally, a service technician inspects a group of elements which are listed in an inspection chart. Negligence in inspection performance may result in frequent car wash break-downs (and consequently, frequent interruptions in a car wash work which may be expensive for a car wash owner).

The following tips may be useful for the owner during the exploitation of a car wash:

- interruptions in water supply (in such case switch off a car wash completely; a car wash must not be operated without water because high-pressure pumps will get damaged)
- interruptions in electricity supply (in such case, a car wash will not work and, additionally, water of installation pressure will flow from guns. It is a security measure a car wash is equipped with in case of interruptions of electricity supply occurring in winter. Without this security, a car wash would freeze.
- When a boiler does not heat utility water, switch off a car wash immediately. Powder does not dissolve in cold water and if not dissolved, powder constitutes danger to high-pressure pumps

Next, find the reason of a boiler switching off.

Use chemical agents recommended by a producer of a car wash. Using chemical agents with different parameters might decrease lifespan of pumps and other key elements of a car wash.

Do not switch off floor heating system in winter. Firstly, check freezing temperature of a solution which is used to fill floor heating system. If a solution freezes in a pipe leading to floor heating, it may cause damage.

Keep the order at a car wash. Basic on experience, it might be said that car washes where the personnel and the owner care about equipment properly, are less prone to failures and break-downs.
Warranty conditions

1. The Seller guarantees properly functioning equipment for the period of:
   a) 12 (twelve) months from the date of sale.
   b) 24 (twenty-four) months from the date of sale – applicable if and only if throughout the whole period of utilization from the first use, chemical agents obtained exclusively from the Seller shall be applied in the carwash. In the event of application of chemical agents obtained from other suppliers 12 months warranty shall apply, final date of which shall be counted from the date of sale. If the Client misleads the Seller and requests him to perform warranty activities and it shall be proved that that chemical agents obtained from other suppliers have been used in the carwash and 12 months period, counted from the date of the purchase, relapsed, the Client shall be obliged to return the costs of unjustifiable request of warranty service, in accordance with item 13, for each request of warranty service after the lapse of 12 months counted from the date of sale.

2. The warranty includes defects resulting exclusively from: defective materials used in the process of carwash production, incorrectness of carwash erection or improper technology of construction. However, the warranty excludes in particular: the side-effects of defects (for example: consumable losses, lost benefits related to malfunctioning of the carwash) as well as the consequences resulting from improper use of the carwash, the consequences of exploitation or untimely wear of particular sub-assemblies, as shown in item 17.

3. The Client obliges himself to undergo 8 (eight) provided against payment warranty inspections of the carwash in the Seller’s warranty service every three months from the date of purchase or in maximum every 600 work hours in the period of 14 days from the lapse of this period or maximum +/- 15 work hours. The cost of periodical on-site inspection amounts to ........ .00 PLN net + the cost of waste exploitation components.

4. The Client exclusively shall be held responsible for the applications the carwash to periodical inspections. The Client shall be held responsible for not exercising any scheduled dates.

5. Granted by the Seller warranty applies under condition of undergoing periodical inspections by the Client. Not exercising obligatory inspections in scheduled by the Seller dates shall result in loss of warranty as and when the lapse of period for exercising this duty by the Client.

6. It is recommended to file Service Order in every three subsequent months of exploitation or every 600 work hours after the lapse of warranty period.

7. Physical defects shall be eliminated by the Seller within 14 days period in warranty period and within 28 days period under paramount conditions from the date of lodging a written complaint to the Seller’s head office. This date shall be counted upon the receiving by the Seller a written complaint which should include precise specification and location of the carwash defect.

8. A complaint is received by the Seller and the maintenance is performed by authorized maintenance and repair centers appointed and subcontracted by the Seller. Performance of inspection, maintenance or other intervention in the carwash by the Client or by other party contracted by the Client shall result in loss of warranty as and when this intervention.

9. The conditions for a complaint admission and repairs performance on the cost of the Seller:
   a) valid warranty period for the carwash (counted from the date of sale confirmed by issued VAT invoice, depending on the period of either 12 or 24 months counted in the way as shown in item 1);
   b) lodging a written complaint for a carwash to the Seller (Service Order Form);
   c) correctly completed a commission performance protocol along with a maintenance manual (operation manual) signed by both the Seller and the Client without any corrections and deletions;
   d) carefully kept maintenance manual (operation manual) along with documentation of current exploitation performances and possible repairs;
   e) legible carwash serial number consistent with a number entered to maintenance manual (operation manual);
   f) the history of required provided against payment warranty inspections (pursuant to item 3) shown in a reliable way;
g) unique assessment of service technician pointing to the manufacturer’s fault as the exclusive reason of physical defect of a carwash.

10. Failing any of the abovementioned duties specified in item 9 subitems b) – f) by the Client may result in the loss of privileges granted by warranty.

11. The warranty shall not include the following damages resulting from:
   a) exploitation of a carwash inconsistent with operation manual and its purpose;
   b) fire, flooding or destructive influence of environment where a carwash operates (low or high temperature, dampness, chemical agents influence);
   c) the lack of proper installation protections (specified in delivered comprehensive construction design) to which a carwash is connected;
   d) the faulty use of a carwash or omission of current maintenance;
   e) the influence of water, air or ground pollutants;
   f) the intervention of not authorized party in power supply, control panels and working circuit of a carwash;
   g) mechanical defects caused by the client or third party;
   h) the use of cleaning and preservative chemicals different than the Seller shall recommend, pursuant to the content of item 21 of this warranty;
   i) the delayed performance of warranty inspections and negligence of basic duties imposed on the Client by the provisions of this warranty.

12. In the event of unwarranted service order, the Client shall cover all costs of intervention on the basis of VAT invoice issued by authorized service centre.

13. In the period of warranty and ordered by the Seller, the service centre performs provided against payment repairs resulting from the Client’s improper proceedings which are not performed under warranty. However, as of the date when damage causes permanent changes in carwash quality and functioning, the warranty expires as of the date of this damage.

14. As far as a carwash is concerned, performance of any repairs, inspections or undertaking any kind of intervention both external and internal by the Client or any subcontracted by him party shall result in the loss of warranty.

15. Exploitation components and materials essential for proper functioning of a carwash are excluded from the warranty (in particular: all types of filter inserts, membranes, rubber components, oils, liquids, fan belts, seals, hydraulic lines, low and high pressure nozzles, lamps, light bulbs and repair sets for equipment and accessories).

16. The lifetime of selected and mentioned in item 17 components excluded from warranty is specified in the table below. The replacement of elements specified below shall constitute the responsibility of the Client who shall be obliged to use elements recommended exclusively by the Seller. Lack of replacement of worn out exploitation components or application of components other than those offered or recommended by the Seller shall result in the loss of warranty (tolerance +/- 10%; * whichever comes first).
### Detection and elimination of defects

<table>
<thead>
<tr>
<th>Symptom of failure</th>
<th>Reason</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A boiler does not heat water</td>
<td>Lack of electricity</td>
<td>Checking power supply</td>
</tr>
<tr>
<td>A boiler does not heat water</td>
<td>Lack of gas</td>
<td>Reset boiler in case of interruptions of gas supply (RESET button on a burner or a boiler)</td>
</tr>
<tr>
<td>A boiler does not heat water</td>
<td>Lack of water in closed circuit</td>
<td>Check manometer readings. If it shows less than 1bar, fill up a circuit with glycol solution.</td>
</tr>
<tr>
<td>A boiler does not heat water</td>
<td>Wrong setting of thermostat</td>
<td>Check thermo-sensor on a boiler. Additionally, adjust thermostat settings.</td>
</tr>
<tr>
<td>Pump dosing chemical agents does not work properly</td>
<td>Does not apply chemical agents</td>
<td>If pump ticking is audible and chemical agent is not in circulation, clean the back valve seal of a pump dosing chemical agents. If pump ticking is not audible, disassemble a pump then clean it and assemble.</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Damaged (used) high-pressure nozzle</td>
<td>Check if a nozzle is not dirty. If it is jagged (used) replace it with a new one.</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Hose leak</td>
<td>Seal the leak or replace a hose with a new one.</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Leak at boom joints</td>
<td>Seal the leak or replace joints with a new one.</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Used pressure regulator</td>
<td>Check pressure regulator sealing; replace them if necessary</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>High-pressure pump break-down</td>
<td>Check the condition of a high-pressure pump, and in particular: oil and water sealing, high-pressure valves, the condition of a head, oil level</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Lack of water in installation</td>
<td>Switch off the equipment immediately. Operating a pump with no water will result in a permanent damage. Switch on the equipment after the resumption of water supply.</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Bad quality or condition of oil</td>
<td>Check oil level (add some if necessary). Checking oil condition - oil with milky or fuscous coloring should be replaced immediately.</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Water flows from a pump</td>
<td>Check cable connections with a pump. If water is flowing from the area of a head, most probably you should replace water and oil sealers.</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Pump does not work smoothly</td>
<td>Check water sealers, seals under valves and seals in a pump. Also check the condition of reticular filters of collectors.</td>
</tr>
<tr>
<td>Water overflows to a container with chemical agent</td>
<td>Open off-loading solenoid valve</td>
<td>Check if off-loading (circulation) solenoid valve is not damaged.</td>
</tr>
<tr>
<td>Water tray with powder overflows</td>
<td>Damaged floater valve</td>
<td>Check the condition of floater valve, and if possible, adjust it. If the valve is not damaged you should clean it (possibly soil prevents it from closing)</td>
</tr>
<tr>
<td>Issue</td>
<td>Resolution</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Damaged solenoid valve 256</td>
<td>Check repair set in a solenoid valve 256. If it is broken, water may leak into a tray with powder from the bottom causing the overflow. If the replacement of repairmen set does not work, replace whole solenoid valve.</td>
<td></td>
</tr>
<tr>
<td>Wrong settings of switching on circulation temperature</td>
<td>Check in the computer the switching on circulation temperature. Check the temperature of surroundings.</td>
<td></td>
</tr>
<tr>
<td>Circulation pump break-down</td>
<td>Check if a pump reacts to ON/OFF switch. Check if a circulation pump is covered with water, if not – cover it with water.</td>
<td></td>
</tr>
<tr>
<td>Circulation pump cannot take water from circulation container</td>
<td>Check if a sucker is not clogged. Check if a pump is covered in water.</td>
<td></td>
</tr>
<tr>
<td>Lack of water in circulation tank</td>
<td>Supply with water in a circulation tank. Remember about regular cleaning and filling with water of a circulation tank. Check if a water floater works properly.</td>
<td></td>
</tr>
<tr>
<td>Break-down of a valve in a high-pressure gun</td>
<td>Check if a gun valve is not damaged. Check if a winter valve is installed in a gun (other one will not allow water in the anti-frost circulation system)</td>
<td></td>
</tr>
<tr>
<td>Damaged high-pressure reverse valve</td>
<td>Check if a reverse valve of high-pressure is not soiled. Replace it with a new one if necessary.</td>
<td></td>
</tr>
<tr>
<td>No salt tablets in brine container</td>
<td>Add salt immediately. Make sure there is always salt in a container. Start up a manual regeneration of a softener bottle immediately.</td>
<td></td>
</tr>
<tr>
<td>Lack of water in brine container</td>
<td>Check water level in a brine container. The level should go 10-15 cm above salt strainer. Add water if necessary. Check water pressure in sewage system. Start up a manual regeneration of a softener bottle immediately.</td>
<td></td>
</tr>
<tr>
<td>Damaged cable connecting brine container with a head</td>
<td>Check if the cable is not disconnected, damaged or bent. Seal it or replace with a new one if necessary.</td>
<td></td>
</tr>
<tr>
<td>Increase in water hardness of sewage system</td>
<td>Softener settings should be changed.</td>
<td></td>
</tr>
<tr>
<td>Lack of power supply or water in a sewage system</td>
<td>Start up a manual regeneration of a softener bottle immediately. In case of lack of water, power supply, softener bottles will not be regenerated.</td>
<td></td>
</tr>
<tr>
<td>Reversed osmosis system does not produce water</td>
<td>Lack of water in a sewage system. Check if 6213 osmosis solenoid valve is not open. Check the level of filter soil.</td>
<td></td>
</tr>
<tr>
<td>Osmosis pump does</td>
<td>Check if osmosis motor works properly. If it works but a pump</td>
<td></td>
</tr>
<tr>
<td>Issue</td>
<td>Solution</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>not work</td>
<td>does not rotate, check if a clutch is not displaced. If a clutch is OK, replace a pump.</td>
<td></td>
</tr>
<tr>
<td>Rotarometer readings on product equals 0</td>
<td>Osmosis settings should be checked (1 membrane - waste min 100 ltr/h, 2 membranes – waste min. 200 ltr/h). If waste was lower then a membrane could get clogged. Check water hardness. A membrane should be replaced with a new one.</td>
<td></td>
</tr>
<tr>
<td>Wrong water hardness</td>
<td>Hard water may clog a membrane. Start up a regeneration of a softener bottle. Then replace a membrane of reverse osmosis system.</td>
<td></td>
</tr>
</tbody>
</table>
Appendices

1. Central heating lay-out

1. Two-function boiler
2. Thermostatic mixer
3. Thermometer
4. Sewage system out-flow
5. 3bar safety valve
6. Heating pump
7. Main heating valve
8. Stand n circulation
9. Emergency outlet of a distributor
10. Back to n stand
11. Emergency inlet of a distributor
12. Diaphragm containers
13. Manometers
14. Valve of water filling in the installation
2.1. CW2 hydraulic lay-out (permanent weep gun)
2.2. CW2 hydraulic lay-out (no-weep gun)
2.3. CW3 hydraulic lay-out (permanent weep gun)
2.4. CW3 hydraulic lay-out (no-weep gun)
2.5. CW4 hydraulic lay-out (permanent weep gun)
2.6. CW4 hydraulic lay-out (no-weep gun)
2.7. CW5 hydraulic lay-out (permanent weep gun)
2.8. CW5 hydraulic lay-out (no-weep gun)
2.9. CW6 hydraulic lay-out (permanent weep gun)
2.10. CW6 hydraulic lay-out (no-weep gun)
2.11 Hydraulic lay-out (permanent weep gun) – description

The list of elements in hydraulic installation of utility water

1) Manometer on entry
2) Main valve of the equipment
3) 50 microns entry filter
4) Valve of entry filter
5) Two-column softener
6) Reverse valve of pressure adapter
7) 1[1] pressure adapter
8) 6 bar safety valve
9) Sewage system out-flow
10) Diaphragm container
11) Thermostatic mixer
12) Two-function boiler
13) Thermometer after the mixer
14) Manometer of warm water circulation

Reversed osmosis installation

15) Valve of reversed osmosis installation
16) Primary filter 5 microns of reversed osmosis
17) Valve of primary filter of reversed osmosis
18) Reversed osmosis

Program 4 installation

19) Pump of osmotic water installation
20) Osmotic water container
21) Valve cutting off dosing pump of osmotic water installation
22) Dosing pump of program 4 installation
23) Valve of stand n[2] Pr. 4
24) Solenoid valve of stand n Pr. 4
25) Solenoid valve of stand n Pr. 4

Installations of programs Pr. T[3], Pr. F[4], Pr. 3 are identical therefore just one is described below

26) Valve cutting off dosing pump of installation j[5]
27) Installation dosing pump j
28) Valve of n stand of installation j
29) Solenoid valve of n stand of installation j
30) reverse valve of n stand of installation j

Installation of Pr. 1
31) Valve cutting off power supply of water, powder and shampoo [6] mixing container
32) Floating valve of water, powder and shampoo mixing container
33) Powder dispenser
34) Water, powder and shampoo mixing container
35) Valve of n stand of Pr. 1
36) Solenoid valve of n stand of Pr. 1

Installation of Pr. 2
37) Valve of n stand of Pr. 2
38) Solenoid valve of n stand of Pr. 2
39) reverse valve of n stand of Pr. 2

Chemical agent container
40) refinisher container Pr. 4
41) shampoo container Pr. T
42) Container for wheel rims cleaning agent Pr. F
43) Polymer container Pr. 3

High-pressure installation for all stand is identical, therefore just n-elements shall be described
44) Valve with a strainer
45) High-pressure unit
46) High-pressure reverse valve of a circulation
47) High-pressure regulator of pressure
48) High-pressure washing gun with a permanent weep valve

Circulation installation
49) Circulation pump
50) Pressure adapter with manometer
51) Circulation tank
52) Floating valve of a circulation tank

[1] Applied to equipment with injection dosing
[2] Number of stand
[3] Applied in equipment of 5, 6 programs
[5] Installation of Pr. T or Pr. F or Pr. 3
[6] shampoo is used exclusively for the main wash support version
[7] used exclusively when there is no gun with permanent weep valve
2.12 Hydraulic lay-out (no-weep gun) – description

**The list of elements in hydraulic installation of utility water**
1) Manometer on entry
2) Main valve of the equipment
3) 50 microns entry filter
4) Valve of entry filter
5) Two-column softener
6) Reverse valve of pressure adapter
7) [1] pressure adapter
8) 6 bar safety valve
9) Sewage system out-flow
10) Diaphragm container
11) Thermostatic mixer
12) Two-function boiler
13) Thermometer after the mixer
14) Manometer of warm water circulation

**Reversed osmosis installation**
15) Valve of reversed osmosis installation
16) Primary filter 5 microns of reversed osmosis
17) Valve of primary filter of reversed osmosis
18) Reversed osmosis

**Program 4 installation**
19) Pump of osmotic water installation
20) Osmotic water container
21) Valve cutting off dosing pump of osmotic water installation
22) Dosing pump of program 4 installation
23) Valve of stand n[2] Pr. 4
24) Solenoid valve of stand n Pr. 4
25) Solenoid valve of stand n Pr. 4

**Installations of programs Pr. T[3], Pr. F[4], Pr. 3 are identical therefore just one is described below**
26) Valve cutting off dosing pump of installation j[5]
27) Installation dosing pump j
28) Valve of n stand of installation j
29) Solenoid valve of n stand of installation j
30) reverse valve of n stand of installation j

Installation of Pr. 1
31) Valve cutting off power supply of water, powder and shampoo [6] mixing container
32) Floating valve of water, powder and shampoo mixing container
33) Powder dispenser
35) Valve of n stand of Pr. 1
36) Solenoid valve of n stand of Pr. 1

Installation of Pr. 2
37) Valve of n stand of Pr. 2
38) Solenoid valve of n stand of Pr. 2
39) reverse valve of n stand of Pr. 2

Chemical agent container
40) refinisher container Pr. 4
41) shampoo container Pr. T
42) Container for wheel rims cleaning agent Pr. F
43) Polymer container Pr. 3

High-pressure installation for all stand is identical, therefore just n-elements shall be described
44) Valve with a strainer
45) High-pressure unit
46) High-pressure reverse valve of a circulation
47) High-pressure regulator of pressure
48) High-pressure washing gun with a non-weep valve

Circulation installation
49) Circulation pump
50) Pressure adapter with manometer
51) Circulation tank
52) Floating valve of a circulation tank

[1] Applied to equipment with injection dosing
[2] Number of stand
[3] Applied in equipment of 5, 6 programs
[5] Installation of Pr. T or Pr. F or Pr. 3
[6] shampoo is used exclusively for the main wash support version
[7] used exclusively when there is no gun with non-weep valve
3. One-period lay-out (400 and 230)
### 4. EVERYDAY ROUTINE EXPLOITATION ACTIVITIES TO BE PERFORMED ONCE A DAY

<table>
<thead>
<tr>
<th>No.</th>
<th>Activities to be performed</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I have checked the level of chemical agents</td>
<td>Turbo</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td></td>
<td>Powder</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td></td>
<td>Wax</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td></td>
<td>Refinished</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>2</td>
<td>I have checked the level of salt in a brine container (there must be salt cubes in the container in the quantity of min. ½ of a container)</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>3</td>
<td>I have checked the general condition of the equipment, leakages, cleanliness</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>4</td>
<td>I have checked the guns and lances against leakages and if the water flow is even during wash, and if a nozzle cover or a nozzle itself are not damaged</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>5</td>
<td>I have checked the level and condition of oil in pumps</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>6</td>
<td>I have checked the condition of high-pressure pumps; if they work smoothly, the condition of oil, leakages</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>7</td>
<td>I have checked the cleanliness of water filters</td>
<td>filter 10&quot;-50</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td></td>
<td>filter 20&quot;-5</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td></td>
<td>filter 10&quot;-1</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I have checked if rubber covers of buttons are not damaged</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I have checked if the head of softener work properly</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I have checked the pressure of solution (water + glycol) on ACV boiler (manometer reading)</td>
<td>1&lt;......&lt;2.5 bar</td>
<td>1&lt;......&lt;2.5 bar</td>
<td>1&lt;......&lt;2.5 bar</td>
<td>1&lt;......&lt;2.5 bar</td>
<td>1&lt;......&lt;2.5 bar</td>
<td>1&lt;......&lt;2.5 bar</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I have checked the temperature of ACV boiler (manometer reading)</td>
<td>............... °C</td>
<td>............... °C</td>
<td>............... °C</td>
<td>............... °C</td>
<td>............... °C</td>
<td>............... °C</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>I have performed the measurement of water with softener hardness (degree of hardness)</td>
<td>0 ≤ ............... ≤ 1 °d</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Worker's signature</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**REMINDER:** KEEP CLEANLINESS AND ORDER IN THE EQUIPMENT ALL TIMES! IN CASE OF LACK OF WATER IN THE INSTALLATION, CLOSE ALL CAR WASH STANDS IMMEDIATELY!

CALL 0-801-000-536 OR 607-735-705 TO ASK ALL SERVICE QUESTIONS
### 5. WEEKLY ROUTINE EXPLOITATION ACTIVITIES

<table>
<thead>
<tr>
<th>No.</th>
<th>Activities to be performed</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I have replaced water filters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>filter 10”-50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>filter 20”-5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>filter 10”-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I have cleaned coin collectors (pursuant to the instruction manual)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I have checked the tightness of solenoid valves (whether a solenoid valve allows water flow during high level of work load)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I have cleaned all dirt and soil inside a car wash (spilled powder or liquids, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I have cleaned all dirt and soil outside a car wash (washed a car wash module)</td>
<td></td>
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<tr>
<td>6</td>
<td>Worker’s signature</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

ATTENTION! WATER FILTERS SHOULD BE REPLACED WHEN SOILED (IT MAY BE MORE OFTEN THAN ONCE A WEEK)
6. EVERYDAY ROUTINE EXPLOITATION ACTIVITIES TO BE PERFORMED ONCE A DAY IN THE PERIOD BETWEEN 31.10 TO 30.04

<table>
<thead>
<tr>
<th>No.</th>
<th>Activities to be performed</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I have checked the circulation tank and (if that was necessary) I have filled it with water</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>2</td>
<td>I have checked the operation of circulation system in all stands</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>3</td>
<td>I have checked the capacity of gun cases</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>4</td>
<td>I have checked additional heating inside a car wash (heater or radiator switched on).</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
<td>yes / no*</td>
</tr>
<tr>
<td>5</td>
<td>I have checked the pressure of solution (water + glycol) on ACV boiler (manometer reading)</td>
<td>1&lt;……&lt;2.5 bar</td>
<td>1&lt;……&lt;2.5 bar</td>
<td>1&lt;……&lt;2.5 bar</td>
<td>1&lt;……&lt;2.5 bar</td>
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<td>1&lt;……&lt;2.5 bar</td>
<td>1&lt;……&lt;2.5 bar</td>
</tr>
<tr>
<td>6</td>
<td>Worker’s signature</td>
<td></td>
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