

English
ECN
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Colophon

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Guarantee

- **Included:**

General components which has gone perceptible failure as a result of material errors, production errors or poor labour performance. Electric components which falls under this provision.

- **Guarantee period:**

These start at date of delivery. Failures are exclusively covered by guarantee if the machine is fully registered via the DiBO website : www.dibo.com. The guarantee period is determined on 5 years (or max. 2500h working hours when a time counter is used) since some conditions are met.

Guarantee conditions at 5 years guarantee:

- The machine must be regularly offered according the maintenance schedule (at least once a year) for a service at DiBO or a recognized service / maintenance station.
- This guarantee period can only be guaranteed since the approve of a maintenance certificate.
- Excluded are wear parts like spray guns, lances, hoses, ...
- DiBO B.V. will not meet in working hours and mileage reimbursements.
- Register your machine online through your customer or dealer account.

For an application to guarantee you must contact immediately your supplier. A guarantee application which is too late communicated, is no longer handled.

- **Guarantee attribution:**

The guarantee attribution occurs by repairing to the faulty component.

The mailing costs are always at the expense of the customer.

The replaced faulty components become property of DiBO B.V.

- **Not guarantee included:**

Indirect arisen damage.

Normal wear.

Damages arise of failure or incompetently use.

Damage incurred during loading, unloading or transport.

Damage by freezing.

Damage which is too late reported.

Costs of repairing by third parties.

- **Guarantee expires:**

At owner change.

At repairs not carried out by an accredited DiBO technician/dealer or at modifications without prior consent by DiBO.

- **Liability:**

DiBO B.V. cannot become as a manufacturer put responsible for personal lesion, damage to properties of third parties, company damage, production loss, capital loss, loss of goods and such, which has arisen by poor or too late supply of sold Article, irrespective of the cause of this. DiBO B.V. cannot also become put responsible for the possible detrimental impact of chemical cleaning products which are added.

The machine is designed in such a way to be safe to use and maintain. This applies to the uses, circumstances and guidelines described in this documentation. Everybody who works with or on the machine must therefore read this documentation and follow the instructions it contains. In the event that the machine is used by the employees of a company in the course of their work, their employer is responsible for ensuring that they are familiar with and follow the instructions in this documentation. Additional safety measures related mainly to working conditions may be in force in the company or country in which this machine is used. This documentation does not describe how these measures must be complied with. It does, however, contain all the information you will need about the actual machine. If you have any doubts, ask the respective government official or your safety officer.

Marking through attention symbols

In this user guide and on the machine some areas can be emphasised with attention symbols. These attention symbols indicate on a possible danger or point of interest. Ignoring such indications can lead to physical wounds, machine - or company damage.



User guide:

Before taking into operation the high pressure cleaner ; always go through this user guide attentively and keep within range.



Please note:

Not following these work - and/or operating instructions accurately (or not exactly) can lead to serious personal injury, fatal crash, heavy machine damage or company damage.



Electric tension:

These instructions indicate on correct handling with electric components of the machine. The areas / zones on the machine marked with this symbol, contain electric components and must never be opened or modified by unauthorised persons.



Toxic substances:

When the machine is equipped to work with chemical / detergent additives / products.

Ignoring these points of interest can lead to irritations, wounds and even deadly result.

Follow the product instructions steeds always conscientious.



Fire danger:

These instructions indicate on operations which can cause fire, which can lead to serious damage and personal wounds.



Heat danger:

These instructions indicate on dangers for heat and hot surfaces, which can cause personal wounds.

Marked areas / zones on the machine can NEVER be touched or approached when the machine is in operation and even at an eliminated machine attentiveness remain necessary.



Indication:

These instructions contain information or recommendations which simplify the work and ensure a safe use.



Hand/arm vibrations:

This indicates information about danger on hand/arm vibrations, which can lead to serious damage and personal injuries.

Follow the instructions more carefully.

Safety – general warnings



General:

The DiBO high pressure cleaner is a cleaner, which produce a water jet under high pressure. The cleaner can be exclusively used by trained and qualified persons who have been instructed in the service of it and explicitly with the service of it have been charged. For this reason a complete knowledge of this guide is necessary to avoid damage to yourself, third parties, objects or to the machine self. The machine is not suitable for use by children or young people (through 16 years)! Not instructed personnel or persons with limited psychical, physical skills may not use the machine. If the machine is used by other persons than you must as an owner inform the user of the safety regulations. The use of the high pressure cleaner falls under the applying national provisions. Beside the instructions for use and in the country where the machine is used applying, binding regulations concerning accidents prevention, also the recognised technical rules for safely and judicious work must be observed. Each working method which can be dangerous for the security, must be avoided.



High pressure hoses:

High pressure hoses, fittings and joints are important for the security of the machine. Use only by the manufacturer approved high pressure parts! Do not use the high pressure hose as an draft cable. Maximal submitted working pressure and temperature are printed one the high pressure hose. Let the hoses cool off after hot water operation or operate the appliance briefly using cold water. Look out for tripping hazard when the high pressure hose is unrolled from the reel.



Spray with HP- jet:

The high pressure jet can be dangerous if she is abused. The jet cannot be aimed on yourself, persons, animals, installations under electric tension or at the machine itself.



Never spray electric installations with water: danger for persons, short circuit danger.

Sensitive parts not cleaning with the point jet. At cleaning pay attention to sufficiently distance between the high pressure sprinkler and the surface to avoid a damage of the surface to clean. During the use keep all protective coverings and doors of the machine closed. Define the spray array clearly and provide a delimited distance with minimum 6 m around the spray array. Remove all loose elements within the spray array, they could blow away. Never spray from an unstable duty station (ladder, small boat, wharf...). During working with the machine repercussion strengths appear to the lance. If the lance stand slanting, moreover occur a turn moment. For this reason hold the lance with both hands.



Carry security clothing, security optical device and hearing protection!

• Spray lance:

Stop the engine, if the spray lance must be exchanged. Make sure the protective cap is covering the sprinkler nozzle.

Fix the lance coupling firmly to the gun. Don't block the handle of the spray gun when the spray gun is in use.

Before the spraying activities: always hold the spray lance downwards!



Machine:

Never take the machine in use without water. Even a brief lack of water can lead to serious damages! When the machine is connected to the drinking water supply, the existing regulations about that must be observed (EN 1717). The machine must stand on a stable horizontal base with the brake on! Work at artificial light: if daylight offers not sufficient visibility during the use, the use of adapted impermeable lighting armature + stretches to recommendation. In spaces provide with standard lighting these must remain on wide distance of the water jet. Never work during adverse weather conditions (eg storm, rain, ...) in the open air. The machine at filling station or in other danger areas because of the explosion danger, which can assume the burner, only uses outside the determined danger area. Fixed adjustments of the machine can be modified under no circumstances himself. The high pressure cleaner has been made in running order and tested by DiBO according to the safety standards. Never solvent holding fluids such as petrol, oil or dilution suck in, the arisen spray veil can be extremely inflammable and/or toxic. When the machine is in use these can never be left behind unattended. Pay attention to sufficient ventilation. Machine does not cover or use in spaces with insufficient ventilation! Vehicle tyres/tyre valves may be cleaned only with a minimum spray distance of 30 cm. Otherwise, the high pressure spray can cause damage to the vehicle tyre/tyre valve. The discolouring of the tyre is the first sign of damage. Damaged vehicle tyres are a source of danger. Do not spray materials containing asbestos or other health hazardous substances.



Water exit:

See for a sound and smooth water outlet of the effluent. If there is cleaned with detrimental chemicals or when the object to clean is strongly polluted, the effluent must be purified before draining this in the sewer.



Usage of different products (cleaning product, softener, decalcifier,...) (when applicable):

Avoid adding chemicals or cleaning detergents to the water tank. Read **always** firstly the regulations on the packing of the product. **Never** clean with inflammable products. See for separate care/cleaning of evacuation water. See for the necessary personal protective equipment (glove, clothing, optical device...). **Avoid spilling** from a product. Put the product tank directly beside the machine. Remove the filling cap and hang the supply hose in the tank. Care always for a ventilated hole in the filling cap! Take care that the tank is always protected sufficiently against the used medium.



Softener:

Special fluid for soften of hard and very hard water. Application of this product reduced considerably fastening on floating lime - and iron chloride parts on heating spirals, piping, sprinkler heads etc. of heating equipment, high pressure - and steam cleaners, etc.. A continuous use will extend the durability of the machine considerably and improve simultaneously the output strongly. Use the DiBO softener (1.837.001/3.8550.650) , contact DiBO for more info. Good softeners are:

- Biologically degradable
- PH between 6-9
- NOT inflammable



Traffic:

Protect piping and cables which run over a roadway with dock boards.



Personal safety measures:

Do not move the machine during operation. Avoid a bad body posture. Consult immediately a doctor at skin penetration and definitely state the type of used product.



Special instructions for hot water devices (if applicable):

Only the specified fuel may be used. Unsuitable fuels must not be used as they may present a hazard. Never fill the machine when in operation. Do not touch the burner kettle and do not cover the gas outlet opening. Injury and fire danger. Never refuel near a heat source or open flame. Do not smoke! Fuel is a volatile toxic substance, do not inhale fumes unnecessarily.



Installing of machines and flue gas outlet in a workspace (if applicable):

When installing machines with a combustion engine in a room, you must ensure that there is sufficient air supply and that there is sufficient flue gas - air extraction. The burner outlet must have a free outlet. Do not release combustion gases into an enclosed space, use chimney / exhaust. Use a draft stabilizer/ interruptor at too long chimney / extractor, this is to prevent possible back pressure that could cause the boiler to become too hot! For further technical information on installing the machines, please contact the DiBO representative. Pay attention on damages by the invading cold air via the air exhaust at freezing temperatures.



Vibrations (hand / arm):

The hand/arm vibrations have **no** harmful influence at use of a cleaner with normal nozzle. The action value of 2.5 m/s^2 and limit value of 5 m/s^2 (= risk indication) are hereby not reached at intensive use on weekly basis! A long use of the cleaner with rotating head can cause physical ills such as: blood flow disturbances, through vibrations on lance and spray gun (see technical data). Therefore, care your personal protective measurements such as protective gloves. With regular, prolonged use of the cleaner and repeated occurrence of symptoms (e.g. tingling of fingers, cold fingers, pain in joints of hand/arm, nerve disorder), we recommend to take a medical check- up! Continuous operation during a long period is not recommended at use of the lance with rotating head, so work with pauses to reduce the exposure time, use alternating the ordinary spray nozzle during a period or change regularly of user!



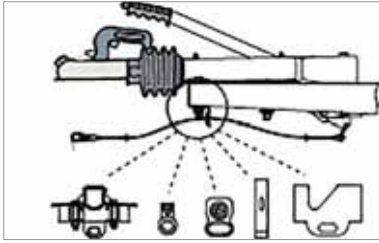
Indication of possible inhalation of aerosols:

During use of the cleaner aerosols can arise. These aerosols are harmful to the health. Take the necessary precautions to prevent possible inhalation of aerosols (eg dust masks to protect, FFP Class 2 or higher). The DiBO lance is equipped with a protective cap in front that offers minimal protection against the release of aerosols.



Trailer (if applicable):

Do not climb on the trailer if it is not connected to a towing vehicle. No permitted use as a lifting device for either people or animals! None of the safety devices may be removed or put out of operation. Ensure that nobody can become trapped, do not exceed the maximum load/maximum permitted ball thrust (see type plate). A valid driving licence is obviously required for driving with the trailer. Your trailer should ALWAYS be provided with good readable, official license plate according to your country regulations. Place the plate on the back side of the trailer and make sure it is properly illuminated by the license plate light! Also note on a good tire pressure! Pay attention to the risk that the trailer might skid or swerve, you should also adjust your driving speed depending on road conditions and the load you are pulling. This applies especially to bends, notice that your car reacts differently with the trailer coupled! In runs with a brake, trailer loaded, it is important that you limit the speed for handling and manageability of your combination. Do not handle this speed limit as striving but as absolute maximum!



- **Hand brake (braked trailer version):**

Pay attention to risk of accident due to failure of the hand brake! If the trailer is to be uncoupled from the towing vehicle, the hand brake must be applied and the trailer must be secured by means of two additional wheel blocks. At parking or placing of the whole combination, tighten also the hand brake! Danger - risk of injury! The trailer may roll back before the full braking force is applied! Ensure that there is sufficient space when parking the trailer.

- **Breakaway cable (@ braked trailer):**

Always route the breakaway cable through the breakaway cable guide ring! See photo beneath. Attach the breakaway cable in such a way that cornering is not impeded. The breakaway cable must not be wrapped around the jockey wheel.

Observe country specific regulations when attaching the breakaway cable.

Danger due to uncoupling of the trailer!

- **Jockey wheel / support arm:**

Ensure that the jockey wheel is seated securely and that the support arm is secured, before driving on the road!



Working with steam (if applicable):

There is a risk on burning injuries at operating temperatures above 98 °C! Never touch the steam jet! Please note that some materials can cause stresses when you clean these surfaces with steam (eg: risk of glass breakage at cleaning of glass surface), Always steam gently the surface to be cleaned at first use! Always provide sufficient personal protective equipment whenever you work with steam!

Use the appropriate spray equipment!



Tarpaulin (option - if applicable):

Use the tarpaulin only when transporting the trailer or when the cleaner will NOT be used! At spraying activities: remove & loosen the tarpaulin (this because of sufficient ventilation (air duct) and operating/ visibility of the control panel)!



Durability of the machine:

The durability of your cleaner will be determined / is dependent on the care & maintenance interventions you spend on the cleaner. The instructions, information and suggestions in this manual (and all delivered documentation) are for this purpose a guide to guarantee optimal service life (durability). Avoiding the hazards, possible repairs, failures of the cleaner, will improve the reliability of the machine. Regularly performing a maintenance procedure moreover extends the durability of a machine.



Risk analysis:

On the machine a risk analysis has been carried out. The risk analysis focuses on mapping the most important risks that may occur during use and / or maintenance and the measures that have been taken to exclude or minimize the risk. The safety rules can be followed to limit these risks. Please note; the machine is constructed in such a way to avoid dangerous situations as much as possible, but a totally risk-free machine is not possible. There are always residual risks present. Therefore, read all (safety) instructions in this chapter carefully and inform yourself if there are any uncertainties.



Maintenance:

Electromechanical, pneumatic and hydraulic work must always be carried out by persons with expertise in relation to this specific work. Always inform the different operators before starting any special and / or maintenance work. Always follow the maintenance and / or inspection activities as described in this manual. The periodic checks and the replacement of parts must also be followed as described. We advise that new people are instructed about the possible dangers, as well as the prevention of the various dangers.

Before commissioning

Before every start up, all essential parts of the high-pressure cleaner must be checked, by taking them in consideration like for example: is the lance coupling tight, check the high pressure hoses and the electrical wiring on damages. Check, before plug in the plug in the socket or the electric indications on the name plate are suitable with the values of the main power supply (for example: electric tension,...) (if applicable). Operate the machine. Rinse the hoses, spray gun and lance minimum 1 minute with clean water (aim the spray gun in free space). Check whether hazardous substances such as asbestos and oil can come loose from the object to be cleaned and pollute the environment. Persuade yourself of the safety requirements mentioned in previous chapter. Leave the main switch / key switch on position 0- OFF. Before putting into use: close the protective cap (if applicable) & at option tarpaulin (if applicable): dismount the tarpaulin.

ACCOMPLISH WATER SUPPLY AND WATER DISCHARGE

1 Accomplish water supply

The water supply line can be connected (according circumstances) on their own water supplies (under pressure, ...) or on a drinking water supply with a water barge. When the machine is connected to the drinking water supply, the existing regulations about that must be observed (EN 1717). If necessary place a filter in the water supply line.

- Water supply under pressure:

Maximum hose length 50 m (160 ft), minimum hose diameter (internal) 12.7 mm (1/2").

Check the water pressure by means of a watermeter.

- Water supply at units with HT- pumps:

When the unit has a HT- pump a pre-pressure pump must be installed.

2 Discharging water

Verify whether all water drains are correctly connected to the sewer system.

Take the necessary measures to ensure that the waste water is pure enough to discharge/drain.

3 Anti- legionella bacterium measure

If the machine has stood still some time, the water in the machine must be discharged above a drain.

Stagnant water that is warm between 20-55 ° C can cause the legionella bacterium.

- Clean therefore the pipes and vessels annually.
- Rinse periodically.
- Remove possible sediment.

Components

GENERAL

Irrespective of the type of high pressure cleaner the cleaner exists from a range of characteristic machine components which are shown below. Thus each cleaner have its own maximum pressure and maximum flow. These you can retrieve in the technical data of the machine.

The type ECN-M consists of 2 wheels with below support, the type ECN-L consists of 4 wheels with brake system.

VISUAL PERCEPTION

ECN -M

- 1 lifting eye
- 2 main switch
- 3 push bar
- 4 pressure gauge
- 5 high pressure exit (product supply)
- 6 spray lance
- 7 water supply (+ filter)
- 8 high pressure pump
- 9 pressure regulating valve



ECN-L

- 1 lifting eye
- 2 main switch
- 3 push bar
- 4 pressure gauge
- 5 high pressure exit (product supply)
- 6 spray lance
- 7 water supply (+ filter)
- 8 high pressure pump
- 9 pressure regulating valve
- 10 brake



Operation

MAIN SWITCH

The switch has been carried out as a turn button switch. It has two positions:

- 0 = OFF
- 1 = ON

If the machine has been carried out with a start/stopper system, the machine will stop 30 seconds after releasing the gun. Operate the spray gun and the machine starts automatically.



PRESSURE REGULATOR AND PRODUCT INJECTOR

1 Pressure regulator:

The pressure regulator/regulating valve is mounted at the back side of the cleaner in the neighbourhood of the pump. On the pressure regulator is a turning button (not always present), where the spray pressure can be established continuously.

The ECN-L has a pressure regulating valve present with a fixed factory adjustment, which is not adjustable!

Turning the button to the right for a higher pressure (+).

Turning the button to left for a lower pressure (-).

The pressure can only be adjusted if the spray gun is operated.

The spray pressure is indicated on the pressure gauge.

2 Product injector (ECN-M):

The chemical injection is mounted at the back side of the machine in the neighbourhood of the pressure regulator. The kind of injector can differ and/or put on another place in the neighbourhood of the pressure regulator. By turning the adjustable product injector to the right or the left, one can arrange the supply of the product.

The other type of injector is directly integrated on the valve (fig 1) and can be operated by a double spray lance. This one is not adjustable. Fill the product tank only with permitted products.

Before taking the unit into use, first check if the used product is arranged to use with the material of the unit.

At doubt get in touch with the salesman of the product or an acknowledged DiBO technician.

- 1 pressure regulator
- 2 chemical injection

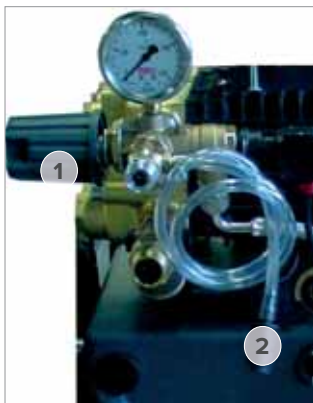


Fig. 1



SPRAYING TOOLS

The high pressure spray gun is carried out with a (grey) handle. There are different types/quantities of spray lances provided, depending on the type of machine. Tighten the lance to the spray gun through the coupling (see photo). The double spray lance, if available, has two spray pipes. Halfway the spray lance is a handle which is rotating. Turn handle right is closed. Spray jet with highest possible adjustable pressure. There will be no sucking in of the chemicals. Turn handle left is open. Spray jet with reduced pressure. Second jet with low pressure. How lower the pressure, the product will be sucked in.

Spray gun

- Do not spray: release the lever in the handle.
- Spraying: push the lever in the handle.
- Spray security: release the blocking pawl in the handle.
- The machine is standard equipped with a single lance.



SET TO WORK

- Put the high pressure cleaner as much as possible in a horizontal position.
- Connect the spray gun with the high pressure hose (without spray lance) to the high pressure cleaner.
- Connect the high pressure cleaner electrical (plug in socket).
- Turn the main switch to position 1=ON.
- Aim the spray gun in to the free space and operate the spray gun until the water jet is completely de-aerated (+/- 30 sec.). Turn the main switch to position 0=OFF. Connect the spray lance to the spray gun.
- Turn the main switch to position 1=ON.
- Operate the spray gun and check the working pressure on the pressure gauge.
- Adjust if necessary the pressure regulator for the right working pressure.



Attention to start the ECN-L:

Turn the main switch to position 1: ON = ON. Start the cleaner, take care that the high pressure gun will **not** be pressed during 6 seconds. otherwise the thermal protection of the cleaner will break down! After that one can use the cleaner properly. Check before using the cleaner first the good turning direction of the motor!



Pay attention at a cold start from the cleaner: in some cases it could be that the automat breaks down in the electrical cabinet (only with 11 KW motors). This depends from the situation of the electrical installation on the spot.

So it's recommended to use a fuse with characteristic D.

Contrôler premier le sens de rotation du moteur, avant démarrer le nettoyeur

PUMPS HT

There must be present a pre- pressure (pump) at HT pumps (pumps with high temperature). The pre- pressure (pump) must provide for sufficient flow of water to feed the high pressure pump and to occur cavitation. Cavitation is the phenomenon that in a moving fluid the local pressure is going to be lower than the vapour pressure of the fluid. Because of this mist bells will arise who can implode with high power in the pump and could cause damages. For all these applications at high temperature, it is **ABSOLUTELY ESSENTIAL** to feed the pump with positive pressure (at least 3 bar) and with a sufficient quantity of water.

SCOPE OF APPLICATION

Efficient high pressure cleaning is achieved by following a few guidelines combined with your own experiences. Each cleaning job is different and specific, therefore contact DiBO for the best solution in your application sector.

- Using cleaning products (if applicable): the surface to clean should be sprayed so the product can act during some time (do not let it dry!) before cleaning with high pressure jet.
Cleaning agents can increase the cleaning effect if they are used correctly!
Always follow/consider the safety instructions of the used product!
- Cold water (high pressure) cleaning: removal of (mild) impurities/pollution and rinsing.
- Hot water (high pressure) cleaning (if applicable): the cleaning effect will be such improved through increasing the temperature (set the temperature experimentally according to the application).
- Cleaning via lance with rotating head (if applicable): cleaning method to remove tough layers of dirt.
- Cleaning using a steam lance (if applicable): this steam function (by overheating water) is used in 'sensitive' cleaning applications (eg: damage sensitive surfaces) where there is stubborn dirt (eg: degreaser) is removed by using steam.



Please note: this application has high cleaning temperatures and requires various safety measures!

Intended Use: this pressure washer has been developed for use in various professional applications (eg: building technology, cleaning technology, industrial, transport sector, ...).

Turn off

GENERAL

Put the main switch on **0: OFF** when you finish the works.

LANCE AND GUN

Uncouple the lance and put it away. Close the water supply. Roll up the high and low pressure hoses.

WATER OUTLET

See chapter "Safety – general warnings" on page 9 .

PUT AWAY MACHINE

Clean when necessary the water filter. See that the machine is parked frost-proof. Furthermore, it is recommended to empty the cleaner and accessories of water, or rinsing with antifreeze. Press the wheel clip protections at the front side (at both wheels - @ ECN-L).

ENVIRONMENTALLY SAFE DISPOSAL OF USED FLUIDS

No fluids (anti-scale product, oil, ...) may be disposed randomly because of the environment! So make sure, if you are user, that the applicable local guidelines for environmentally friendly disposal of these fluids (without soil pollution) are complied.

TRANSPORT

Pay attention at transport to the following: keep the machine as much as possible horizontal during transport, one prevents that there leaks oil from the pump.

Load the machine using a lift truck, hydraulic loading platform or a hoist. Lash the machines (if necessary) sound fixed on the loading platform.



Pay attention: the charging/lifting of the unit must happen according to the photos like mentioned below by means of the provided lifting eye. This according to applying standards/directives and with the correct lifting tools! Care for a uniform load distribution. Leave a loaded object never abandoned!

Be sure that nobody is in the neighbourhood of the charged object at lifting work activities!

Check before use of the lifting eye if they are corroded, damaged or has break.

TRANSPORTATION AT FROST

Replace the water sucking hose by a short piece hose and hang it with his end in the anti-frost, so the machine can suck in the anti-frost. Take the lance from the gun and operate the machine.

Spray until there comes anti-frost out of the gun. The machine is now filled with anti-frost, stop the machine.



Tip: Because the catch of the outgoing anti-frost water, this can be re-used afterwards.

Service

GENERAL

All maintenance activities must happen at an **disconnected machine** and **hoses without pressure**.

Checking the electric components can happen exclusively by an expert.

Exclusively accessories and replacement components which have been approved by the manufacturer can be used. Directly after the activities all securities- and protection parts must be assembled, before the machine is put in functioning; “a golden rule” that contributes to a perfectly working machine with few problems, is well the following:



A daily control and cleaning of the machine frequently do wonders!

To be able to guarantee a perfectly working system, one has first necessary a reliable and technical well considered machine, which is then faced secondly at regular times with a thorough maintenance.

Therefore the experience and the “know-how” of DiBO a technical good working machine is insured and large maintenance turns can be carried out by experienced DiBO technicians by means of appointment or maintenance contract, we can suppose in advance that it is satisfied to these two points.

MAINTENANCE DIAGRAM

1 | General

The user can carry out only those actions for which in this book authorisation are given. Each other act has been prohibited! Check even all transmission belts on good tension and possible defects. If this case is not, then best consult the proper

2 | Periodic maintenance

DESCRIPTION	PERIOD
Control of the electric cables, high and low pressure hoses and coupling and control of the oil level.	After each use.
Refreshing pump oil.	First 50 hours. .
Cleaning water filter.	Each 50 hours/every month.
All following refreshments of pump oil and service on the cleaner.	Each 400 hours/yearly.
Extra control/replacement of joints, valves, o- rings by acknowledged DiBO- technicians.	Each 600 hours.

**3 | Control of oil level / refreshing of pump oil**

Check for each use of the machine the oil by way off oil level glass or with the oil level bar.

Oil must stand right with the sign of the oil level bar, if the this case is not, oil tops up until the sign.

If oil looks forward to there milky, consult directly the DiBO technicians. To refresh oil, as follows work goes:

- Unbolt the drain plug below the pump.
- Unbolt the tap with the oil level bar.
- Catch all oil in a barge and remove oil.
- Force up the drain plug there and top up the oil in the breach to the upper part to the right level.
- Force up the tap with the oil level bar there. Recommended oil: 1.836.042.

4 | Cleaning of the water filters

Clean the water filters regular and remove possible dirt.

5 | Maintenance at expense of DiBO technicians

For further maintenance (burner, engines, high pressure pump and parts who has to do with safety) we advise to contact your DiBO distributor concerning a maintenance contract.

The maintenance applies to normal company circumstances.

At heavy circumstances you can communicate this so that can be taken into account.

Supplement documents:

- Control manual
- CE- certificat

Remarks:

We advise the owner/user at strongest to make an appointment with DiBO against reaching the given up company hours, to be able to guarantee a good and regular maintenance concerning a maintenance turn.

DESCRIPTION DAILY CONTROL**1 | Frame**

Check the frame in its entirety at loose bolts and/or cracks of the welds.

Keep the machine as much as possible clean to prevent act on dirt, water, oil and messed fuel.

2 | Valves + manometer

At an switched off machine, this means a halted engine, the manometer must reflect 0 bar.

At an maximum performing machine, this means operated at full load working engine, the manometer can not indicate more than the maximum pressure by DiBO indicated, for your machine.

After operation and releasing the gun can still remain a small pressure remainder present.

The reflected value of the manometer must be between 0-30 bar, the valves are then all right.

3 | High pressure pump

Check the pump on loose connections, bolts, seals and leaks.

Puts the machine on a horizontal base. The oil level must stand halfway the level glass.

Take at doubt the oil level stick separately, where the oil level must stand between both mark lines.

If pump oil gives a milky impression, frequently indicates this on an internal leak as a result of which water touched oil there.



Immediately repair by a DiBO technician is necessary then.

4 | High pressure- and low pressure part

Check the hoses, piping and connections on external damages and leaks.

If damaged or leaks these must be immediately replaced.

5 | Spray tools

Check lances and guns on leaks, external damages and hair cracks.

If damaged or leaks these must be immediately replaced.

Check the spray image of the water jet, if these blows out to much you must replace the nozzle.

Check protective cap-nozzle on damages and replace if necessary.

Check the thread of the couplings on external damages. At damage let these replace without delay.

6 | Electrical part

Checks visible electric wiring and components (among other things switches) on external visible damages.

If damaged let replace the concerning parts.

Malfunction table

At a possible malfunction one can consult the table mentioned below and if you obtain on this basis no solution, we advise to contact a diBO technician and/or a recognized DiBO representative.

MALFUNCTION	CAUSE	SOLUTION
Machine does not start	<ul style="list-style-type: none"> •Electrical supply not connected •Net fuse defect •Main switch on "0" •Rest malfunctions 	<ul style="list-style-type: none"> •Connect the electrical supply •Check net fuse •Put main switch on "1" •Consult an expert
No water pressure	<ul style="list-style-type: none"> •To few water inlet •Filter stuffed-up 	<ul style="list-style-type: none"> •Repair water inlet •Clean/replace filter cartridge
Instable and to weak pressure	<ul style="list-style-type: none"> •Air in water supply (leaks in water supply) •Nozzle or lance stuffed-up or worn-out. •Pressure regulator defect •Rest malfunctions 	<ul style="list-style-type: none"> •Put machine completely without power! Repair leaks in supply. •Clean or replace •Consult an expert •Consult an expert
No additions of products	<ul style="list-style-type: none"> •Suction pipe •Suction filter stuffed-up •Product tank empty •Spray pressure to high 	<ul style="list-style-type: none"> •Repair suction pipe •Clean suction filter •Refill or replace tank •Lower spray pressure
HP pump pulse	<ul style="list-style-type: none"> •Leak or congestion in supply conduit •To much air present 	<ul style="list-style-type: none"> •Clean/replace/repair •De-aeration of cleaner

Technical info

GENERAL

In this chapter you find the most important technical data of the range where your machine belongs. Machine statement See end of book “*Technical data*” on page 23 .

GENERAL DATA

- Maximum reactive force of the sprinklers: <60N
- Minimum water pressure (at LP entrance): 200 kPa (2 bar)
- Maximum water pressure (at LP entrance): 300 kPa (3 bar)
- Minimum water temperature: 1 °C
- Maximum water temperature: see “*Technical data*” on page 23 “
- Sufficient water supply at drinking water quality (Directive 98/83/EG)
- The use of an extra water filter is recommended

ACCESSORIES

1 x user manual

VIBRATION MEASUREMENT (HAND/ARM) - ROTATING HEAD

As previously mentioned, when using the rotating head of the cleaner (note: not all cleaners have a lance with rotating head), the action values will be reached sooner. Below, a table is mentioned with the vibration intensity and exposure time (in hours) of the lances with rotating head on a weekly basis.

The measurements were carried out in the capacity of an accredited laboratory.

This measurements were carried out according to the Royal Decree of 7 July 2005 and EN-ISO 5349:1.

TYPE	VIBRATION INTENSITY (AEQSUM)	EXPOSURE TIME (ACTION) ON WEEKLY BASE	EXPOSURE TIME (LIMIT) ON WEEKLY BASE
ECN-M 110/13	6.0 m/s ²	7 h	28 h
ECN-M 160/16	0.3 m/s ²	+ 40 h	+ 40 h
ECN-M/T 160/22	9.3 m/s ²	2.52 h	11.31 h
ECN-M/T 160/30	5.5 m/s ²	8.20 h	33 h
ECN-M 220/16	8.9 m/s ²	3.1 h	12.42 h
ECN-M/T 220/22	10 m/s ²	2.3 h	10 h
ECN-T 220/30	5.6 m/s ²	8.04 h	32 h
ECN-M 260/16	8.9 m/s ²	3.1 h	12.42 h
ECN-T 260/22	9.8 m/s ²	2.5 h	10.11 h
ECN-T 320/18	0.3 m/s ²	+ 40 h	+ 40 h



Note: the version with reel reduces the vibration exposure time. Increasing the water temperature (for ex.: through the hotbox) does not raises the vibration exposure time.

Aftercare

STORE HIGH PRESSURE CLEANER



Store the high pressure cleaner frost- proof!

Follow the directives concerning switching off of the machine, like described in chapter “Shut down the machine”.

Mind the necessary safety requirements for transport and storage of the machine.

Pay attention to models with burner and/or combustion engine, some parts can remain very hot after use during a considerable time. Repair damages directly. Keep the operating guide within hand range.

INACTIVITY DURING A LONG PERIOD

Always check near a longer inactive period of the machine :

- If the power cable is disconnected.
- If the fluids are removed from the tanks (oil, chemical products,...).
- If the parts are protected against the accumulation of dust.
- If all hoses, cables,... are put away safely.
- When using CNG, ensure that all tanks and conduits are emptied of gas.

Preventive action → Put the machine briefly back into service on regular base !

REMOVE INSTALLATION ENVIRONMENT FRIENDLY

After a number of faithful years of service irrevocable the durability of each installation is exceeded.

Used electric and electronic machines must be processed separately according to the law of the processing, re- use and recycling of the product. The national governments supply sanctions against persons who dispose garbage of electrically or electronically material or leave behind illegitimately. The machine must then be removed as ecologically sound as possible.

The possibilities those are open:

- Exchange on a new machine.
- Hand it in to a waste processing company.
- Outside the E.U. It is best to contact the local authorities for information about correct disposal.

Disposal of your old appliance



1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.

2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.



3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.

4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.

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Technical data

SUMMARY TABLE MACHINES

	1.110.771	1.110.071	1.110.206	1.110.406	1.110.511
TYPE	ECN-M 400/16	ECN-M 140/41	ECN-M 160/30	ECN-M 220/22	ECN-M 260/22
	1103 x 768 x 1033 (mm)	1103 x 768 x 1033 (mm)	1103 x 768 x 1033 (mm)	1103 x 768 x 1033 (mm)	1103 x 768 x 1033 (mm)
	120 kg	kg	120 kg	113 kg	120 kg
	3x400 V - 50 Hz - 26.4 A	3x400 V - 50 Hz - 26.4 A	3x400 V - 50 Hz - 16.8 A	3x400 V - 50 Hz - 16.8 A	3x400 V - 50 Hz - 26.4 A
 kW	11	11	7.5	7.5	11
	400 Bar	140 Bar	160 Bar	220 Bar	260 Bar
	16 l/min	41 l/min	30 l/min	22 l/min	22 l/min
 MAX INPUT	40 °C	40 °C	40 °C	40 °C	40 °C
 MAX OUTPUT	40 °C	40 °C	40 °C	40 °C	40 °C
	88 dB	dB	80 dB	82 dB	81 dB
	0 l	0 l	0 l	0 l	0 l
 1	1.644.053	1.644.052	1.644.052	1.644.052	1.644.052
 2	/	/	1.644.006	/	1.644.006
	1.643.055	1.643.005	1.643.011	1.643.011	1.643.011
 1	1.645.452	1.645.131	1.645.081	1.645.056	1.645.036
 2	/	/	1.646.076	1.646.009	1.646.007
	1.610.342	1.610.342	1.610.292	1.610.292	1.610.342
	1.601.655 (11 KW / 15 hp)	1.601.635 (16.2 KW / 22 hp)	1.601.607 (9.2 KW / 12.5 hp)	1.600.277 (8.5 KW / 11.5 hp)	1.601.589 (10.3 KW / 14 hp)
	1.617.180	1.617.140	1.617.156	1.617.154	1.617.166
	1.836.042	1.836.042	1.836.042)	1.836.042	1.836.042









































	1.110.451	1.110.501	1.110.571	1.110.306	1.110.156
TYPE	ECN-M 220/30	ECN-M 260/16	ECN-M 320/18	ECN-M 220/16	ECN-M 160/22 SS
	1103 x 768 x 1033 (mm)	1103 x 768 x 1033 (mm)	1103 x 768 x 1033 (mm)	1103 x 768 x 1033 (mm)	1103 x 768 x 1033 (mm)
	120 kg	110 kg	120 kg	110 kg	110 kg
	3x400 V - 50 Hz - 26.4 A	3x400 V - 50 Hz - 16.8 A	3x400 V - 50 Hz - 26.4 A	3x400 V - 50 Hz	3x400 V - 50 Hz
 kW	11	7.5	11	5.5	5.5
	220 Bar	260 Bar	320 Bar	220 Bar	160 Bar
	30 l/min	16 l/min	18 l/min	16 l/min	22 l/min
 MAX INPUT	40 °C	40 °C	40 °C	40 °C	40 °C
 MAX OUTPUT	40 °C	40 °C	40 °C	40 °C	40 °C
	dB	80 dB	dB	85 dB	79 dB
	0 l	0 l	0 l	0 l	0 l
 1	1.644.052	1.644.006	1.644.053 (2x)	1.644.006	1.644.006
 2	1.644.006	1.644.052	/	1.644.052	1.644.052
	1.643.011	1.643.011	1.643.011	1.643.011	1.643.011
 1	1.645.071	1.645.021	1.645.021	1.645.026	1.645.056
 2	1.646.074	1.646.034	1.646.034	1.646.005	1.646.012
	1.610.342	1.610.292	1.610.342	1.610.212	1.610.212
	1.601.627 (11 KW / 15 hp)	1.600.273 (71 KW / 9.7 hp)	1.601.663 (14.7 KW / 20 hp)	1.600.273 (71 KW / 9.7 hp)	1.600.277 (8.5 KW / 11.5 hp)
	1.617.156	1.617.166	1.617.166	1.617.154	1.617.154
	1.836.042	1.836.042	1.836.042	1.836.042	1.836.042

	1.110.491	1.110.601	1.110.826	1.110.861	
TYPE	ECN-L 220/41	ECN-L 320/23	ECN-L 500/15	ECN-L 500/18	
	1193 x 773 x 1054 (mm)	1193 x 773 x 1054 (mm)	1193 x 773 x 1054 (mm)	1193 x 773 x 1054 (mm)	
	190 kg	185 kg	185 kg	195 kg	
	3x400 V - 50 Hz - 40 A	3x400 V - 50 Hz - 32 A	3x400 V - 50 Hz - 32 A	3x400 V - 50 Hz - 40 A	
 kW	18.5	15	15	18.5	
	220 Bar	320 Bar	500 Bar	500 Bar	
	41 l/min	23 l/min	15 l/min	18 l/min	
 MAX INPUT	40 °C	40 °C	40 °C	40 °C	
 MAX OUTPUT	40 °C	40 °C	40 °C	40 °C	
	90 dB	90 dB	84 dB	84 dB	
	0 l	0 l	0 l	0 l	
 1	1.644.052	1.644.053 (2x)	1.644.053	1.644.053	
 2	/	/	/	/	
	1.643.005	1.643.011	1.643.031	1.643.031	
 1	1.645.306	1.645.031	1.645.452	1.645.016	
 2	/	/	/	/	
	1.610.442	1.610.392	1.610.392	1.645.442	
	1.601.635 (16.2 KW / 22 hp)	1.601.675 (14.7 KW / 20 hp)	1.601.659 (14.7 KW / 20 hp)	1.601.667 (17.4 KW / 24 hp)	
	1.617.142	1.617.180	1.617.205 & 1.617.510	1.617.205 & 1.617.510	
	1.836.042	1.836.042	1.836.042	1.836.042	






	1.108.825	1.108.880	1.109.981	1.109.983	1.109.500
TYPE	ECN-T 500/15	ECN-XL 500/30	ECN-M 250/23	ECN-L 350/16	ECN-M 260/16
	1083 x 597 x 968 mm	1465x810x1035 mm	1083 x 597 x 968 mm	1465x810x1035 mm	1083 x 597 x 968 mm
	173 kg	472 kg	151 kg	194 kg	115 kg
	3x400 V - 50 Hz	3x400 V - 50 Hz	3x400 V - 50 Hz	3x400 V - 50 Hz	3x400 V - 50 Hz
 kW	15 kW	30 kW	23 kW	16 kW	7.5 kW
	500 Bar	500 Bar	250 Bar	350 Bar	260 Bar
	15 l/min	30 l/min	23 l/min	16 l/min	16 l/min
 MAX INPUT	40 °C	40 °C	40 °C	40 °C	40 °C
 MAX OUTPUT	40 °C	40 °C	40 °C	40 °C	40 °C
	94 dB	101 dB	81 dB	78 dB	87 dB
	50 l	/	50 l	/	0 l
 1	1.644.053	1.644.053	1.644.052	1.644.053	1.644.052
 2	/	/	1.644.006	/	1.644.006
	1.643.031	1.643.031	1.643.011	1.643.022	1.643.011
 1	1.645.452	1.645.427	1.645.041	1.645.021	1.645.021
 2	/	/	1.646.008	1.646.034	1.646.004
	1.610.392	1.610.522	1.610.342	1.610.342	1.610.292
	1.601.659	1.601.792	1.601.827	1.601.663	1.601.273
					
	1.836.042	1.836.042	1.836.042	1.836.042	1.836.042

	1.109.005	1.109.105	1.109.155	1.109.305	1.109.405
TYPE	ECN M 110/13	ECN M 160/16	ECN M 160/22	ECN M 220/16	ECN M 220/22
	1083 x 597 x 968 mm	1083 x 597 x 968 mm	1083 x 597 x 968 mm	1083 x 597 x 968 mm	1083 x 597 x 968 mm
	97 kg	95 kg	100 kg	104 kg	115 kg
	1x230 V - 50 Hz	3x400 V - 50 Hz	3x400 V - 50 Hz	3x400 V - 50 Hz	3x400 V - 50 Hz
 kW	2.2 kW	4 kW	5.5 kW	5.5 kW	7.5 kW
	110 Bar	160 Bar	160 Bar	220 Bar	220 Bar
	13 l/min	16 l/min	22 l/min	16 l/min	22 l/min
 MAX INPUT	40 °C	40 °C	40 °C	40 °C	40 °C
 MAX OUTPUT	40 °C	40 °C	40 °C	40 °C	40 °C
	82 dB	80 dB	86 dB	85 dB	88 dB
	0 l	0 l	0 l	0 l	0 l
 1	1.644.052	1.644.052	1.644.052	1.644.052	1.644.052
 2	1.644.006	1.644.006	1.644.006	1.644.006	1.644.006
	1.643.011	1.643.011	1.643.011	1.643.011	1.643.011
 1	1.645.031	1.645.031	1.645.031	1.645.031	1.645.031
 2	1.646.006	1.646.007	1.646.012	1.646.005	1.646.009
	1.610.011	1.610.162	1.610.212	1.610.212	1.610.292
	1.600.517	1.600.263	1.600.277	1.600.273	1.600.277
					
	1.836.042	1.836.042	1.836.042	1.836.042	1.836.042

LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Code		Ear protection
	Lance		Clothing protection
	Spray gun		Air displacement
	Standard accessories		Vacuum
	Optional accessories		Reel
	Weight		Noise level
	Dimensions (LxBxH)		Pump HP
	Working pressure		Oil
	Water flow rate		Remote control
	Water temperature in (max.)		Water filter
	Water temperature out		Flow (direction)
	Consumed power / motor		Recycling
	Consumed power / burner		Environmental friendly removal
	Trailer		Nozzle
	Power supply		Rotating head
	Fuel tank capacity		Battery
	Softener tank capacity		Drive
	Valve		Electric motor
	Recuperation tank capacity		Hydraulic motor
	Watertank capacity		Fuel engine

Color table nozzles

NOZZLE SIZE	NOZZLE COLOR	DESCRIPTION
025		Pink
030		White
035		Brown
040		Yellow
045		Dark blue
050		Purple
055		Red
060		Light green
065		Black
070		Orange
075		Light blue
080		Dark grey
090		Light grey
100		Beige
125		Opal green
135		Dark green

* See PDF for the colors (not visible on printed version).