

INSTALLATION AND MAINTENANCE MANUAL

BILOVAX LS-50 POOL-HEATER

WOOD HEATING MONOBLOCK UNIT

bilovax LS-50
par/by L.S. Bilodeau inc.



THESE INSTRUCTIONS MUST BE KEPT AND LOCATED IN VIEW NEAR THIS UNIT.

GENERAL INFORMATIONS

CAUTION: AN IMPROPER INSTALLATION, ADJUSTMENTS, INCORRECT SERVICE OR MAINTENANCE MAY CAUSE MATERIAL DAMAGES AND/OR INJURIES. TO OBTAIN FURTHER INFORMATION OR ASSISTANCE, PLEASE CONSULT A QUALIFIED INSTALLER, A COMPETENT SERVICE COMPANY OR THE MANUFACTURER.

CAUTION :

It is of utmost importance to observe the minimum clearances to combustible materials of this unit as indicated on the rating plate to avoid important injury and / or property damage:

Side walls: right side 150 cm (60") left side 150 cm (60")

Wall to back of appliance: 150 cm (60")

Wall to front door of appliance: 150 cm (60") Floor : non-combustible

Minimum from smoke pipe to any combustible surface: 150 cm (60")

CAUTION : IF THE INSTRUCTIONS AND WARNINGS CONTAINED IN THIS MANUAL ARE NOT ADHERED TO, THIS COULD CAUSE A FIRE WHICH COULD RESULT IN BODY INJURIES OR LOSS OF LIFE AND / OR IMPORTANT MATERIAL DAMAGES.

Certified by :



CAN/CSA B415.1

Made by : L.S. Bilodeau inc.

281 route 108 Est, Saint-Éphrem-de Beauce
Quebec, G0M 1R0 Tel. : 418 484-2013

(Rev. 2012-04-30 LD)

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Dear Sir or Madame

CONGRATULATIONS FOR YOUR PURCHASE OF A OUTSIDE WOOD-FIRED POOL-HEATER BILOVAX LS-50 FROM *L.S. BILODEAU INC.* !

It is therefore with pleasure that we enclose your user manual. As you will see, efforts has been made to make this manual as clear as possible. For your convenience, please note that this manual contains three main sections: Installation, startup and warranties.

For questions, please contact us during normal business hours at **1 418 484-2013**, we will be pleased to answer you.

We are happy to count you among our customers. It is in the spirit of always providing you the quality service you need, that we are committed in offering you the best products.

To find all about our range of heating / ventilation devices, maple equipments and laser cutting services, contact us or visit our Website at www.lsbilodeau.com.

Sylvain Bilodeau
President

L.S. Bilodeau inc.

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SECTION 1 : GENERAL INFORMATIONS

1.1) DANGER, CAUTION AND WARNING

Comprenez bien la portée des mots suivants : **DANGER, MISE EN GARDE ou AVERTISSEMENT**. Ces mots sont associés aux symboles de sécurité. Vous les retrouverez dans le manuel de la façon suivante :

DANGER

The word **DANGER** indicates the most serious dangers, those that **will** result in loss of life or major injuries and/or important property damages.

CAUTION

The word **CAUTION** indicates a danger which **could** result in loss of life or major injuries and/or important property damages.

WARNING

The word **WARNING** is used to indicate the dangerous practices which **could** result in light injuries and or minor property damages.

Your pool-heater must be installed by a qualified technician to maintain it's warranty.

IMPORTANT NOTICE

With the *Bilovax LS-50* pool-heater, *L.S. Bilodeau inc.* redefines the pool-heater by providing an easy-to-use and powerful unit. This power comes from a heat exchanger with a unique design combined with a high efficiency wood-burning combustion system. The pool water will quickly reach the desired temperature even under adverse climatic conditions. You do not have to keep the pool-heater *Bilovax LS-50* in operation when you are not using your pool. We invite you to use the pool-heater *Bilovax LS-50* as needed to avoid unnecessary expenses.

It is not allowed to burn an other fuel than solid wood in the *Bilovax LS-50* pool-heater.

WARNING

The warranty on your pool-heater *Bilovax LS-50* will be null and void if the properties of water in your pool does not comply at all times the following conditions:

Chlorine ou Bromine: 1 à 3,0 ppm	pH : 7,2 to 7,6
CALCIUM HARDNESS : 200 to 300 ppm MAX	TOTAL ALKALINITY : 80 to 120 ppm

A HIGH LEVEL OF CALCIUM HARDNESS AND / OR ALKALINITY MAY CAUSE INLAYS ON THE WALLS OF THE POOL AND IN THE POOL-HEATER. IF THE LEVEL OF THE CALCIUM HARDNESS REACHES MORE THAN 300 ppm, THE WATER LEVEL OF THE POOL SHOULD BE BROUGHT DOWN AND THE POOL REFILLED WITH FRESH WATER FOR AN ACCEPTABLE CALCIUM HARDNESS, AS CALCIUM DOES NOT EVAPORATE AND CUMMULATES WITH EACH FILLING OF THE POOL.

CAUTION

Do not store or use gasoline or other flammable vapors and liquids near this or any other heating appliance, as this could cause a fire or explosion which could result in death or severe bodily harm and / or property damage.

Introduction : This manual contains instructions for the installation, use, maintenance, troubleshooting and list of components that will assure the safe use of the *Bilovax LS-50* wood-fired pool-heater.

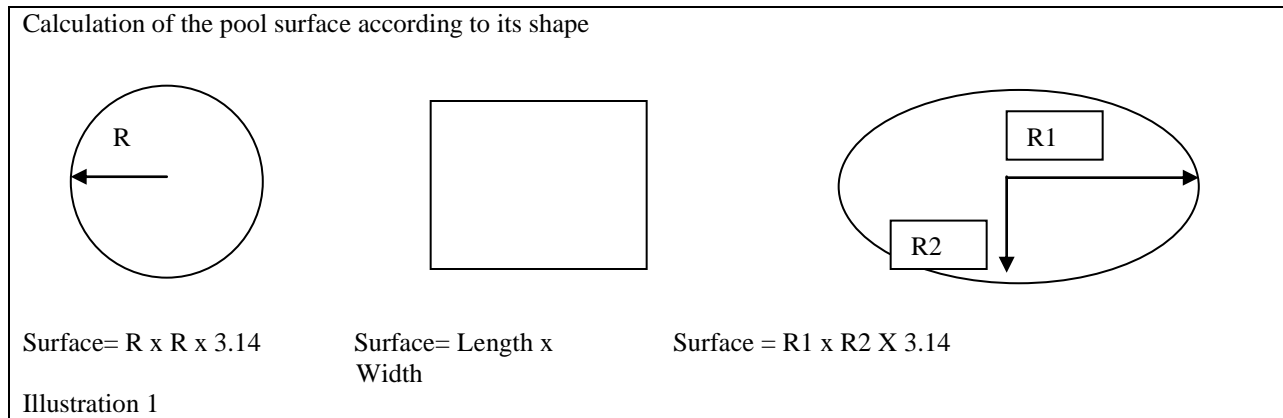
L.S. Bilodeau Inc. strongly recommends that the installer consult this manual attentively before installing the *Bilovax LS-50* pool-heater. If, after having consulted this manual, the installer still has unanswered questions, he is invited to communicate with the local distributor or with the factory to obtain these informations. After completing the installation of the *Bilovax LS-50* pool-heater, the installer must hand over this manual to the consumer for preservation and future consultation.

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2 : POOL SURFACE CALCULATION

The factors influencing the capacity of the pool-heater to heat up a pool includes the size of the pool, ambient temperature, wind exposure and its average velocity and the pool water temperature increase versus ambient temperature. A swimming pool in a sunny and sheltered from wind will be easier to heat than a swimming pool at a windy and less sunny location.



1. Determine the pool surface in square feet. For an indoor pool installation, reduce the pool surface of 2/3.
2. Determine the pool water temperature desired (from 25°C (77°F) to 28°C (83°F)).
3. Determine the average temperature of the air of the coldest month of use.
4. The temperature rise is the difference between what was determined at 2 and 3.
5. Le *Bilovax LS-50* possède une capacité thermique de 165 000 BTU à pleine charge de bois avec du bois dur sec et l'utilisateur devra déterminer avec des essais le rapport entre le nombre de pleines charges de bois utilisées et l'atteinte de la température idéale de sa piscine. The *LS-50 Bilovax* has a thermal capacity of 165,000 BTU at full load of wood with dry hard wood and the user must determine with testing the ratio between the number of full loads of wood used and the attainment of the ideal temperature of the pool.

When the pool is not used, it is recommended to cover it with insulating blanket to reduce heat loss and also the unnecessary use of chlorine and avoid soiling of the filtration system.

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OUTSIDE WOOD-FIRED POOL-HEATER

bilovax LS-50

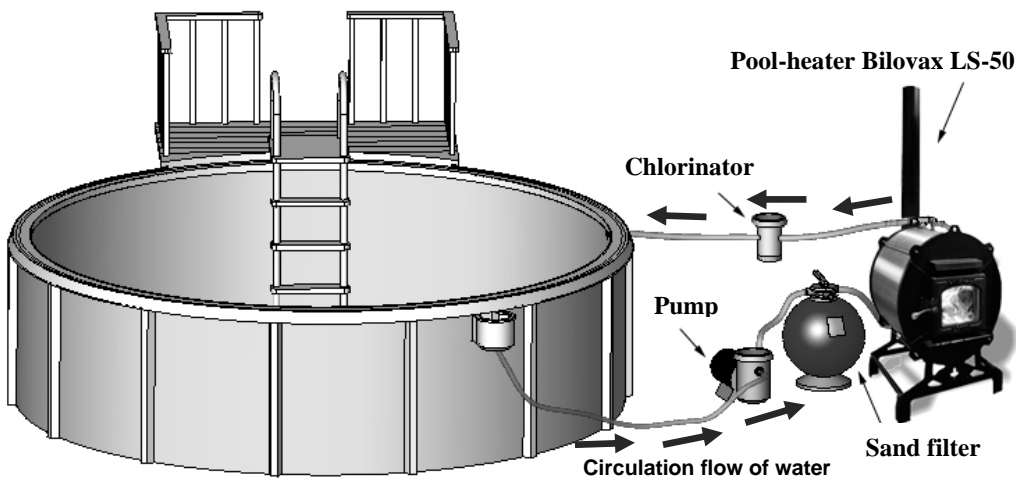
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IMPORTANT NOTICE

SAFETY NOTE

IN NO TIME, the wood-fired pool-heater *L.S. Bilodeau* should not be left unattended.



ATTENTION

Chlorine/Salt: Chlorine tablets should be in a floating container in the pool or the use of a electrolytic or chlorinator device as shown. Check with your L.S. Bilodeau inc. representative for recommended installation for these accessories or devices.

NEVER PLACE CHLORINE TABLETS DIRECTLY INTO THE SKIMMER, THIS MAY DAMAGE THE POOL-HEATER.

- Finished mirror stainless steel (chlorine systems)
or
Finished brushed stainless steel (chlorine or salt systems)
- For in-ground or above ground pools
- May increase the temperature of 3-4°C (7-10°F) per day for a in-ground 16' x 32' pool and 4-7°C (10-15°F) for a above ground 24' pool
- Stainless steel combustion chamber
- 18" maximum log length
- Wood-fired
- **Weight : 250 k (550 lbs)**
- **Dimensions : L 80cm (31-1/2") x H 114cm (45") x P 99cm (39")**
- Water output : 3,8cm (1-1/2")
- Outside installation only
- Requires no electricity

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SECTION 3. INSTALLATION

RECEPTION AND INSPECTION OF THE APPLIANCE:

Upon receipt of the equipment, inspect the packaging of the pool heater to pick out signs of damage, then carefully check the heater to detect any damage during transport or manufacture thereof. If the carton is damaged, please mention this immediately to the carrier so it can be noted on the bill of lading. Any claims for damage or missing items must be made to the carrier.

Important notice: The instructions contained herein are intended for use by authorized, specially trained and experienced in the installation of this type of pool-heater. Some provinces require that persons conducting this type of facility are licensed for this purpose. If this is the case, make sure the technician is in possession of said permit before it can proceed with the installation.

CAUTION

Failure to follow instructions for installing this equipment, the vent and operating instructions in this manual can result in death or bodily harm and / or serious property damage.

COMPLIANCES WITH STANDARDS AND CODES:

The pool heater will be installed in accordance with all local and provincial codes. The installation of this device and the size of the flue pipe, its installation and termination must comply with the following standards: *CAN/CSA-B140.12-03, CAN/CSA-B365-M, CAN/CSA-B366.1-M91 et CAN/CSA-B415.1.*

This pool-heater can be installed:

Outside only with an evacuation chimney pipe with simple wall of 15 cm (6"):

OUTSIDE EMPLACEMENT OF POOL-HEATER:

This device must be installed on a concrete slab or other non-combustible floor (see Figure 5) at least 150 cm (60 ") of the inner wall of a in-ground swimming pool unless it is separated from the pool by a solid fence, wall or other permanent solid barrier. This appliance must be installed at least 150 cm (60 ") of the wall of an above ground swimming pool. It must also be at least 150 cm (60 ") minimum from the reserve of wood, 150 cm (60") of any building and 150 cm (60 ") of any tree. The flue pipe provided of 15 cm (6 ") diameter must have a minimum length of 240 cm (96") and be provided with a conical hat provided as shown in Figure 4. The installer has the responsibility to prevent water accumulation around the unit, and this, year round. Provide adequate drainage and / or by raising the slab on which the heater is placed 20 cm (8 ") from the surrounding soil. Do not install in a location where freezing or thawing could cause its overthrow or force or break the piping.

Chimney stack 15 cm (6")

Water input and output 3,8 cm (1-1/2")

Illustration 4



SLAB OR NON COMBUSTIBLE FLOOR:

Outside, the pool-heater *Bilovax LS-50* must be installed on a concrete slab or other non-combustible floor. It can also be installed on other soil types as long as they are protected by a hollow masonry at least 10 cm (4 ") thick and covered with a minimum 24 gauge galvanized steel. This masonry should be laid with ends unsealed and the joints matched to provide a free flow of air through the slab. Masonry shall extend at least 30 cm (12 ") on all sides of the device. In all cases, it is the responsibility of installer to protect and make sure the soil is not exposed to excessive heat during extended periods of use.

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OUTSIDE INSTALLATION:

The installer must comply clearances positioning already mentioned in section 1. General informations and in the illustration 5 to ensure a sufficient air supply and eliminate fire hazards.

CAUTION

Do not store wood or combustible materials within the required clearances mentioned below.

CAUTION

Chemicals such as chlorine, bromine or other volatile and corrosive chemicals must be stored in another room away from the pool-heater. Failure to follow these instructions makes your warranty null and void.

- 1- The LS-50 Bilovax installed outside according to the standards do not require combustion air intake.
- 2- Always keep clearance to growing shrubs.
- 3- Do not install this unit under an overhang.
- 4- Do not install this unit directly under an overhanging roof edge without rain gutters. Rainwater cascading may affect the operation of the pool-heater.
- 5- Do not install pool-heater where water projected by sprinklers to the ground, could come in contact with it, as this may cause operating problems.
- 6- Do not install the pool-heater to less than 1.50 m (5 ') of an outdoor air conditioner unit or heat pump.
- 7- If the user wishes to hide the pool heater in an enclosure, always maintain the clearances as specified in Illustration 5.

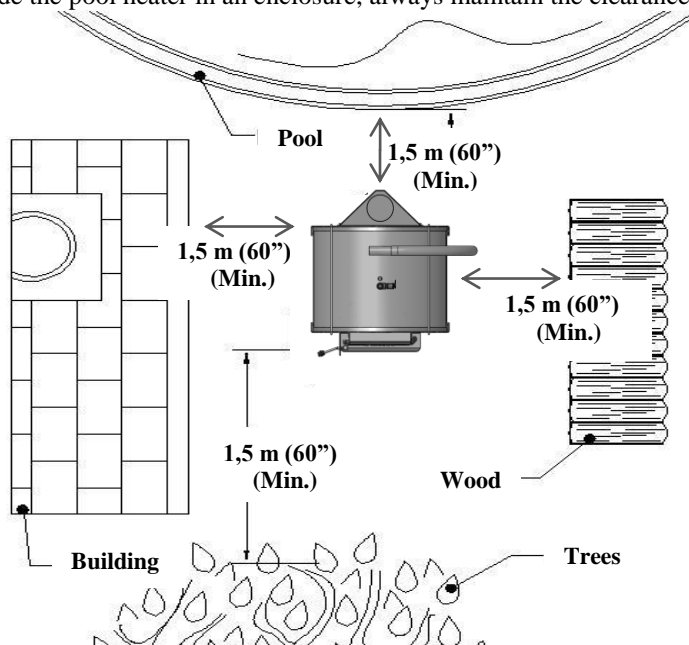


Illustration 5

CHIMNEY:

Smoke pipe/vent connector and supplied stainless steel chimney:

It is very important to respect the clearance between the single wall flue pipe of the *Bilovax LS-50* and combustible surfaces that surround that is 150 cm (60 "). Use stainless steel chimney that came with this device. The smoke pipe / vent connector is the same diameter as that of the chimney provided (15 cm (6 ')). Fittings shall be assembled with the male pipe part down and the sections are joined together by means of three machine screws equidistant from each other on the circumference of the joints. Please ensure that the connecting pipe between the appliance and the chimney will be installed as straight and as short as possible while avoiding multiple elbows, one 90o elbow (not supplied) or equivalent is allowed. On any horizontal length, maintain a slope towards the unit of 6 mm (¼ ") by 30 cm (12") long. To insure a good draft, the total length of the smoke pipe should be between 2.5 m (8 ') to 3 m (10') maximum.

CAUTION

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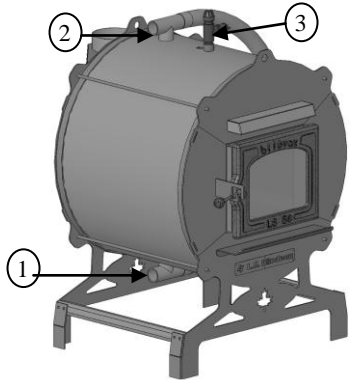
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The Bilovax LS-50 is only intended for outdoor installation. Failure to observe this warning can cause a fire causing death or bodily harm and / or property damage.

- 1) Do not install another heater on the chimney connected to the Bilovax LS-50.

WATER PIPES AND FITTINGS:

The pool-heater Bilovax LS-50 was designed so that its restriction to the total flow of water is not greater than 3 m (10 ') equivalent to a plastic hose of 3.8 cm (1 - 1/2 ") approved for continuous operation at 60o C (140o F). A bypass is not required but may be useful for maintenance of the pool-heater. Input and output connections of the heater will be 3.8 cm (1 - 1/2 ") and easily adaptable to plastic tubing specified earlier. It is strongly recommended to install full flow maintenance valves on pipes and out of the pool-heater especially if the heater is below the water level of the pool. All piping and accessories used in the installation of the pool-heater must be resistant to the corrosive effect of the products used to maintain the healthiness of pool water. We recommend the use of 2 stainless steel clamps at each connection of the plastic pipe.



- 1- Water input 3,8 cm (1-1/2")**
- 2- Water output 3,8 cm (1-1/2")**
- 3- Pressure relief valve 1,9 cm (3/4")**

INSTALLATION ABOVE SURFACE OF POOL:

Si le chauffe-piscine est installé au-dessus de la surface de la piscine, il faudra faire une boucle au-dessus du chauffe-piscine pour prévenir l'évacuation de l'eau du chauffe-piscine lors de l'arrêt de la pompe. If the pool-heater is installed above the pool surface, it will be necessary to loop above the pool-heater to prevent the water drainage when the pump stops .

CAUTION: This pool-heater CAN NOT be heated without the operation of the water pump of your filtration system. Never stop the pump when the pool-heater is operating. DO NOT use any device timer to turn off the water pump.

AUTOMATIC CHLORINATION DEVICES:

If one uses an automatic chlorinator, it must be installed downstream of the pool-heater on the return water pipe towards the pool and at lower-rise than the outlet end of the pool-heater. Put a non-return valve between the chlorinator unit and the output of the pool-heater.

PRESSURE RELIEF VALVE:

The pool-heater *Bilovax LS-50* is equipped with a pressure relief valve to prevent pressure in the boiler if the pool pump were to fail and slow down or cease to circulate the water adequately through the pool heater.

SECTION 4. VERIFICATION AND START-UP

GENERALITIES :

The pool heater must be in working order to perform some of the following verifications. Please consult the manual for procedures of ignition / startup and shutdown of the pool heater. The pool water must flow through the pool-heater for the verification, make sure that there is no air inside the unit before turning it on.

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LOCATION OF POOL-HEATER:

1. It must be installed preferably on a concrete base at a minimum distance of **1.50 m (5 ')** of all **combustible materials**.
2. The *L.S. Bilodeau* pool-heater is designed to be installed **outdoors only**.
3. For a safe and quiet operation, the heater must be level. The pool-heater flue pipe should be as straight as possible.

CONNECTING:

Install the heater so that the entire flow of water of the filtration system passes through the walls of the pool-heater. No valve shall be installed so as to create a pressure or vacuum in the unit. This would damage the inner walls of the pool-heater. The water outlet of your sand filter must be connected to the water inlet under the pool-heater. The water outlet (hot) above the pool-heater must be returned to the pool through usual lines.

N.B. All the water flowing through the filtration system must pass entirely through the pool-heater.

During the heating season, it is possible that the pool-heater creates condensation which will drain under the unit. Such will be noticed when the water is very cold.

WATER PIPES TESTING AND LEAK INSPECTIONS:

Start the pool filter pump and open the relief valve to purge the air from the pool-heater. Once the heater is purged of the air through the relief valve and filled with water, check that all connections are tight and that water does not flow or oozes from the joints between the device and the water inlet and outlet pipes. For leaks, be sure to correct them before proceeding to other tests.

SECTION 5. WOOD HEATING

- Only use solid wood as fuel
- Dry hard wood logs with a maximum length of **18 inches or less** (46 cm) is recommended.
-

FIRING INSTRUCTIONS:

Before lighting the pool-heater, make sure the filter pump is running and that there is no air in the unit. You can purge the air from the unit by gently pulling on the stem of the pressure relief valve. If air comes out, wait until a little water comes out before releasing the valve stem. Open the loading door and inspect the combustion chamber making sure that there is no ash in the background and that the combustion air nozzles are not blocked and clean. It is not recommended to use newspaper for ignition, because it can clog the spark arrestor. It is recommended to use ignition briquettes instead.

Arrange the ignition briquettes in the bottom and cover with ignition wood and a quantity of firewood to fill half the combustion chamber. During ignition, **put the wood to the back of the pool-heater**. Then proceed to the lighting of the ignition briquettes and maintain the loading door slightly open. Make sure the fire is well taken before you close the loading door. After an hour, you can carefully open the loading door and complete the loading of the combustion chamber up to the top to allow a heating cycle up to three hours depending on the type of wood used and its humidity rate.

With subsequent loading, spread the embers evenly to the back of the combustion chamber and place the wood at the most rearward as possible. It is important to respect this mode of loading so that the wood burns like a cigarette from the front to the back of the pool-heater.

**N.B. This pool-heater CAN NOT be heated without the operation of the water pump of your filtration system.
DO NOT use any device timer to turn off the water pump.**

MISE EN GARDE

Do not use flammable liquids or chemicals to start the fire. failure to observe this warning can cause explosion and / or fire causing death or bodily harm and / or property damage.

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FUNCTIONAL AND SAFETY CHECKING :

After 30 minutes of operation where everything seems normal, partially open the door of the Bilovax LS-50 slowly and carefully, then open wide the door and fill out the Bilovax LS-50 with a full load of wood and close the door. The normal cycle of combustion should restart within a short time. With a full load of wood, the Bilovax LS-50 should work for 3 hours at full fire.

SECTION 6. USE AND MAINTENANCE INSTRUCTIONS

GENERALITIES :

Before lighting the pool heater, make sure the pump is running and the water flows freely through the filter and the *Bilovax LS-50* is purged of air. In a new installation, it is recommended to leave the pump and filter running 24 hours to fully purify water. After 24 hours of operation, check that the chlorine content, pH and alkalinity are as prescribed before putting the pool-heater on. See warning and complete information on the properties of water at page 4.

CAUTIONS AND WARNINGS:

WARNINGS

- 1- For safety, it is imperative to keep the loading door closed while the operation of the pool heater.**
- 2- If the burning becomes out of control, keep the loading door firmly closed and the circulation of water through the pool-heater. Please also oversee the seal of the loading door.**

CAUTION

Do not burn garbage, gasoline, naphtha, motor oil, other flammable liquids or chemicals in the pool-heater. Failure to observe this warning can cause explosion and / or fire causing death or bodily harm and / or property damage

WARNING

Do not use this appliance at a temperature below 5oC (40oF) without adequate protection against freezing.

CAUTION

Do not ingest alcohol or drugs before using the pool or pool-heater. Ingestion of such intoxicants can cause drowsiness which may lead to unconsciousness and subsequently result in drowning. Do not heat the pool water at a temperature of over 38.9 oC (102 oF). A temperature of 37.2 oC (100 oF) is considered safe for a healthy adult, warmer water increases the risk of hyperthermia. Remember, pregnant women and young children have a lower tolerance threshold and should not be exposed to such temperatures.

Whenever possible, always use dry wood for better efficiency and less chance of soiling of the device. If you do not want to extend the heating cycle beyond three hours, just let the heater go out by itself.

PERIODIC INSPECTIONS:

The *Bilovax LS-50* pool-heater is designed and built for a long service life when installed and used according to manufacturer's instructions and recommendations. An annual inspection by qualified service staff is recommended to maintain the heater in full operation. Inspection points following are of importance in order to maximize the useful life of the *Bilovax LS-50*.

Periodically check the air intake of the pool-heater to prevent to be blocked with debris or leaves. Always maintain the clearance free of debris, combustible materials, gasoline and other flammable vapors and liquids. Remember shrubs grow and they can come to encroach on the safe clearances of the pool-heater, please bring them in safe clearances by trimming them if this is the case. Make sure your wood supply is also maintained in safe clearances. Also make sure the flue pipes and hat are always firmly connected to the device.

Do not store near the pool-heater chlorine, pool chemicals or other corrosive substances.

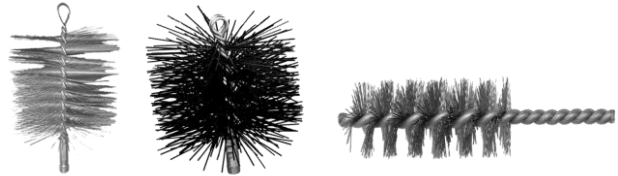
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SECTION 7. CLEANING AND MAINTENANCE:

An inspection program is a good measure of preventative maintenance. Keep this manual in a safe place for future reference or if a service technician wishes to consult it while inspecting or repairing the unit.

RECOMMENDED MAINTENANCE ACCESSORIES:



Chimney sweep brush

Rotary steel brush

- Steel or polypropylene fiber sweeping brush of an adequate size for the flue pipes
- Steel rotary brush of a size of about 5 cm (2 inches) and a minimum length of 30 cm (12 inches)
- Stove or fireplace glass cleaner
- Protective gloves

CREOSOTE – FORMING AND REMOVAL:

When wood burns slowly it produces tar and other organic vapors, which, combined with moisture, form creosote. The creosote vapors condense in relatively cold pipes. The resulting residue is an accumulation of creosote on the inner wall of the smoke flues.

It's still better to prevent creosote building by maintaining a hot fire of dry wood. However, if creosote was accumulating, clean with the recommended sweep brush.

PARK-SCREEN MAINTENANCE:

Give special attention to the spark screen. Depending on the quality of your fuel, the spark screen may be clogged. Cleaning by brush is required.

At end of the season, perform a thorough cleaning with water (no cleaning agent) and light brushing.

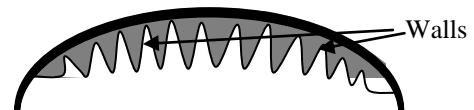
AIR EXCHANGER MAINTENANCE:

Monthly cleaning of the air exchanger section is recommended.

Rotary steel brush



- Open the two access doors at the rear of the pool-heater near the base of the flue pipes.
- Clean the walls of each section of the air exchanger with rotating wire brush recommended.
- Close access doors.



At end of the season, perform a thorough cleaning with water (no cleaning agent) and light brushing.

SMOKE PIPE INSPECTION:

The smoke flue should be inspected regularly during the heating season of the device.

- Remove and clean the flue pipe with the recommended sweep brush.
- Carefully inspect the flue pipe to identify defects.
- If no defects, properly reinstall the flue pipe.
- REPLACE any defective flue pipe.

SECTION 8. EAD OF SEASON STORAGE

PREPARING FOR WINTER:

In temperate regions, the pool-heater can continue to operate during cold periods for a short term, not be used to maintain the water temperature just above freezing, it is not designed for this. In areas where the temperature drops below freezing around mid-November, all water must be drained from the pool-heater at the same time you drain the pool filtration system. This appliance must not freeze and its warranty would be null and void if that happened. Do not use this appliance at a temperature under 5 ° C (40 ° F) without adequate protection against freezing.

At the end of the season, you must open the safety valve on top of the pool-heater and then open the valve under the heater for draining. Rinse the inside of the pool-heater thoroughly with clean water (no cleaning agent) before storage.

Be sure to clean the combustion chamber and the smoke pipes before storing the pool-heater for winter. Take advantage of this opportunity to clean the chimney and flue pipes. Even if it is not required, it is preferable to cover the device a resistant impermeable sheet during winter. You may store the heater in a dry place for winter.

WARNING

IF THE POOL-HEATER IS DAMAGED BY FROST, DAMAGES WILL NOT BE COVERED BY THE MANUFACTURER'S WARRANTY. MAKE SURE TO EVACUATE ALL WATER FROM UNIT BEFORE THE ARRIVAL OF COLD WEATHER.

SECTION 9. SPRING REACTIVATION:

Inspect and clean the pool-heater, making sure that the combustion chamber is free of ash, the combustion air nozzles are not blocked, open the access panel on the back of the pool-heater to inspect and if necessary clean the smoke flues at the rear of the pool heater and make sure that safe clearances are respected.

Inspect the flue pipes and hat. If this has not been done before winter, sweep the flue pipes before starting another heating season.

Turn the filter pump on and let the system run long enough to purge all air of the conduits. Purge all air from the pool-heater by gently pulling on the stem of the pressure relief valve, if air comes out, wait for some water to come out before releasing the valve stem.

To proceed with the lighting of the pool heater, arrange the ignition briquettes in the bottom and cover with ignition wood and a quantity of firewood to fill half the combustion chamber. During ignition, **put the wood to the back of the pool-heater**. Then proceed to the lighting of the ignition briquettes and maintain the loading door slightly open. Make sure the fire is well taken before you close the loading door. After an hour, you can carefully open the loading door and complete the loading of the combustion chamber up to the top to allow a heating cycle up to three hours depending on the type of wood used and its humidity rate. Whenever possible, always use dry wood for better efficiency and less chance of soiling of the device. If you do not want to extend the heating cycle beyond three hours, just let the pool-heater go out by itself.

SECTION 10. SPRING INSPECTION AND MAINTENANCE:

GENERALITIES :

IMPORTANT : only qualified service technicians, with the necessary permits, are allowed to perform maintenance and repair of the *Bilovax LS-50* pool-heater. It should be remembered that all system components can affect the safe operation of the device. Before making troubleshooting tips related to pool heater in section 11, make sure the filter pump is operating normally, the skimmer and screens are not blocked, the valves of the filtration system are fully open and in the normal running position.

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CAUTION

Do not modify or alter any component of the pool-heater or the pool-heater itself in any way. For repairs, only use new parts from the manufacturer of this unit, never use or attempt to use used parts to repair the pool-heater Bilovax LS-50. Failure to observe this warning can cause a fire causing death or bodily harm and / or property damage.

MAINTENANCE:

To ensure safe operation of the pool-heater, it is recommended to perform the following inspections and cleaning as part of the annual spring maintenance.

COMBUSTION CHAMBER INSPECTION AND CLEANING:

IMPORTANT: Inspect the combustion chamber making sure the bricks are in place and undamaged. If the bricks are damaged, you must replace them with new bricks, the bricks are held together by metal plates provided with a key. Remove the plate or plates (s) that hold the bricks to be replaced and replace them.

Make sure the combustion air nozzles are in good condition and unobstructed, that the seal of the door is in good condition and can be reused for another heating season.

SMOKE STACKS INSPECTION AND CLEANING:

Open the access door at the rear and clean the smoke passage and remove any soot or other debris.

SECTION 11. TROUBLESHOOTING:

GENERALITIES :

IMPORTANT : Before referring to troubleshooting tips related to the pool-heater in this section, make sure the filter pump is operating normally, the skimmer and screens are not clogged, the filter system valves are fully open and in the normal running position.

CAUTION

Never leave the pool-heater on for more than 30 seconds with the filtration system stopped because it could lead to significant damage to the device, which could cause unsafe operation of the unit.

TROUBLESHOOTING CHART:

This table can be used as a quick reference guide for problems of maintenance and repair:

PROBLEM	POSSIBLE CAUSES	SOLUTION
THE UNIT WILL NOT REMAIN LIT.	THE SMOKE FLUE LOCATED AT THE BACK OF THE COMBUSTION CHAMBER IS BLOCKED.	THROUGH THE DOOR ACCESS, CLEAN THE SMOKE FLUE

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