



HD 4

BLACK DIAMOND FILTRATION

The Ultimate
in High Definition FILTRATION



HD-4 BLACK DIAMOND INSTRUCTIONS

CONSUMER SAFETY INFORMATION

HD-4- Black Diamond is designed to provide many years of safe and reliable service. The installation, operation and maintenance instructions contained in the following pages will insure your investment in your **Black Diamond**. Throughout this manual there are safety warnings and cautions. Be sure to read and comply with all of these warnings and cautions.

WARNING

Do not operate the **Black Diamond Filter** until you have read and understand clearly all the operating instructions and warning messages. The following instructions are intended as a guide for initial general installation and initial operation. Be advised that each installation may have unique conditions where the starting procedure can be different. Failure to follow all operating instructions and warning messages can result in severe injury, death, or property damage.

THE HD-4 BLACK DIAMOND FILTER OPERATES UNDER HIGH PRESSURE

When any part of the filtering system is serviced, air can enter the system and become pressurized upon restart of the system. Pressurized air can cause the lid to blow off which can result in severe injury, death or property damage. To avoid this potential hazard follow these instructions:

1. Turn off the pump **BEFORE** starting any service on the filter system.
2. Open the manual air relief valve located on the top of the filter. Wait until all pressure is relieved before proceeding.
3. Whenever installing the filter tank clamp be sure to follow the Filter Clamp Instructions Precisely.
4. Once filter system service is complete follow the **System Restart Instructions** Precisely.
5. Maintain circulation system properly. Replace worn out or damaged parts immediately.
6. Be sure the filter system is properly mounted and positioned according to the instructions provided in this manual.

Never attempt to adjust, open or tighten any closures or lids or attempt to remove or tighten any bolts when the system is pressurized or operating. This can cause a separation or failure of filter components. Component failure will result in the instant release of pressure causing component(s) to blow off at high velocities and to travel far distances. Severe personal injury or death could occur if they were to strike a person or persons.

WARNING: RISK OF ELECTRICAL SHOCK/ ELECTROCUTION

The **Black Diamond Filter System** must be installed by a qualified technician and in accordance with all electrical codes and ordinances.

Always disconnect power to the filter equipment at the circuit breaker **BEFORE** servicing the filter equipment. Make sure the disconnected circuit is tagged to prevent accidental connection. Failure to do so could result in serious injury or death due to electric shock.

Position the filter in such a way that the air relief valve will allow water to be drained away from electrical connections. Water discharged from an improperly directed valve can create an electrical hazard and cause severe personal injury as well as property damage.

IMPORTANT SAFETY INFORMATION

- Have a trained pool professional perform all pressure tests.
- Do not connect the **HD-4 Black Diamond** to a Public Water System.
- All wiring, grounding and bonding of equipment must meet local and/or national electrical codes.
- A check valve installed ahead of filter system will prevent filter contents from draining back into pool.
- A check valve installed between filter and heater will prevent hot water from backing up into the filter and possibly damaging internal components.
- Piping/plumbing must conform to local/state plumbing and sanitary codes.
- Make sure all piping is adequately supported.
- Do not pressure test with an air compressor.
- Check local codes for restrictions on backwash or waste water piping.
- Trapped air in the system can create a hazardous condition. Be sure to purge all air from the system before operating, testing or servicing the equipment.

ABOUT YOUR HD-4 BLACK DIAMOND SYSTEM

Diatomaceous Earth DE Filters have always been renowned for providing crystal clear pool water. Cartridge filter systems have been popular for their convenience and ease of maintenance. With the **HD-4 Black Diamond** you get the best of both worlds.

The HD-4 Black Diamond Element Filtration System features 4 easily accessible and removable elements. When water passes through these elements, impurities such as dirt, algae and even some forms of bacteria are filtered out, producing sparkling clear water.

The HD-4 design dramatically increases the filter's internal surface area , giving you much greater cleaning capacity per cycle, all without an increase in the tank size. Maintaining your **HD-4 Black Diamond** could not be easier. You can choose any one of two easy methods to clean your filter. The first choice is to remove and rinse off the elements. The second and most popular choice is to remove the tank lid, open the drain plug and simply rinse the elements in place.

The **HD-4 Black Diamond** design will even save you money because water flows so efficiently through the filter that your pump will use less energy.

The combination of four **Black Diamond** elements in a single tank design means better performance and much longer filter cycles. Longer cycles mean less cleaning and maintenance. Because the **Black Diamond** elements remove the tiniest of contaminants you can be assured of clean, crystal clear water for many years to come.



GENERAL INFORMATION

INSTALLATION

1. Your Filter should be installed on a level concrete slab or base. Take care to position the filter so the instructions, warnings and pressure gauge are visible to the operator. Keep in mind that the piping connections, valve control and drain port must be accessible for servicing, winterizing and routine maintenance.
2. Install electrical controls such as switches and timers at least 5 feet from the filter system.
3. Allow sufficient clearance around the filter tank so you can visually inspect the tank and verify the clamp is properly installed. It is advised to tap the clamp with a mallet or similar tool to make sure the clamp is uniformly loaded before tightening.
4. Allow sufficient space above the filter to allow for lid removal during cleaning and/or servicing.
5. Position the manual air relief valve to safely direct water away from the filter system and all electrical connections.
6. Make all plumbing connections in accordance with local plumbing codes.
7. Filter plumbing connections with O-Ring seals must be lubricated. Use only silicone based lubricant on the O-Rings. **DO NOT** use pipe compound, glue or pipe dope on the bulkhead connections.
8. Be sure to install the pressure gauge before use.
9. Never subject the filter to a working pressure over 50 psi, even when conducting tests.

GENERAL INFORMATION

OPERATION

1. WARNING – This filter operates under **HIGH PRESSURE**. When any part of the filter system is serviced, air can enter the system and become pressurized. Pressurized air can blow the lid off which can result in severe injury, death or property damage. Be sure to follow these instructions :

- a) Before repositioning valves, assembly, disassembly, or adjustment of the clamp or any other service of the system you must **TURN THE PUMP OFF** and **SHUT OFF** any automatic controls to ensure the system is not inadvertently started during service. Then open the manual air relief valve and wait until pressure is relieved.
 - b) Whenever installing the filter clamp you must follow the clamp installation instructions. (page 7)
 - c) Once service of the system is complete follow the restart instructions exactly.
 - d) Maintain your system properly. Replace worn or damaged parts immediately.
 - e) Be sure the filter is properly mounted and positioned.
- 2.** The **HD-4 Filter** operates under pressure. When clamped properly and operated without air in the system, the **HD-4 Filter** will operate in a safe manner.
- 3.** Never operate the system with the pressure in excess of 50 psi.
- 4.** The pressure gauge is the primary indicator of how the system is operating. Be sure to keep the pressure gauge in good working order.

CLAMP INSTALLATION INSTRUCTIONS

The Clamp installation instructions must be followed **EXACTLY** to prevent the lid from blowing off during initial startup, restart or filter operation.

BEFORE working on the Filter System complete the following steps.

- Turn the pump off and shut off any automatic controls.
 - Open the air relief valve and wait for the pressure to be relieved.
1. Make sure the lid O-Ring is in position in the lower tank half. Press the filter lid over the lower tank half sandwiching the O-Ring between the 2 halves.
 2. Keeping the ends of the filter clamp apart, position the center of the filter clamp (the valley of the clamp) over both the upper and lower tank flanges. Carefully bring the ends together as you insert the T-bolt into the union located on the other side of the clamp assembly. (see diagram below)
 3. Place the washer and the tension spring on the barrel nut. Place the second washer on the T-bolt. Hand tighten the nut. Keep checking the clamp for proper seating as you hand tighten the nut.
 4. Tighten the nut using a 7/8 inch wrench. Be sure to tap around the outside of the clamp using a mallet or similar tool (do not use a metal hammer) to ensure proper seating of the clamp. Continue tapping and tightening until the coils in the spring touch each other. Do not tighten beyond that point.
 5. The spring coils should be checked periodically – about once a month – to ensure that they continue to touch each other, indicating that the clamp is under sufficient tension. If they do not touch repeat step 4.



RE-START INSTRUCTIONS

WARNING — This filter operates under **HIGH PRESSURE**. When any part of the filter system is serviced air can enter the system and become pressurized. Pressurized air can blow the lid off which can result in severe injury, death or property damage.

1. Open the manual air relief valve located on top of the filter tank. Opening this valve releases air trapped inside the tank.
2. Stand clear of the filter tank and start the pump.
3. Close the manual air relief valve slowly after a steady stream of water begins to flow from the air relief valve port.
4. The system is not operating properly if:
 - a) A solid stream of water does not appear from the air relief valve within 30 seconds of start up.
 - b) The pressure gauge indicates pressure inside the tank before water out flow appears.

If either condition appears, turn off the pump **IMMEDIATELY**. Open the valves in the water return line to relieve pressure and clean the air relief valve.

CLEANING THE HD-4 BLACK DIAMOND

1. Turn the pump off and turn off any automatic controls.
2. Close the main drain line if your pool is so equipped.
3. Open the air relief valve to relieve any pressure in the tank.
4. Open the waste drain port located on the bottom of the tank.
5. Remove the pump's hair and lint strainer lid and clean out the basket. Replace basket and inspect lid O-Ring. Lubricate O-Ring with silicone lube if O-Ring appears dry. Replace lid onto hair and lint trap.
6. Remove the filter clamp.
7. Remove the filter lid.
8. Check the air relief valve for debris and dirt. Clean if necessary.
9. Remove the top manifold and the elements.
10. Using a garden hose without a nozzle, spray water at elements to loosen and dislodge dirt and debris. Thoroughly wash each element both inside and out.
11. Lift manifold out of tank and wash out any and all debris.
12. Wash out the inside of the tank body.
13. Check the tank gasket located on the lip of the bottom tank half. Gasket should be firmly and evenly in place. **DO NOT USE PETROLEUM LUBRICANTS ON THIS GASKET.**
14. Replace bottom manifold, the 4 elements and top manifold into the filter tank. Make sure the spring and standpipe assembly are retained on the top manifold.
15. Make sure the O-Ring is in position.
16. Replace the top lid carefully, follow the **CLAMP INSTALLATION INSTRUCTIONS.**
17. Replace drain cap.

FOLLOW INITIAL START UP PROCEDURE

QUICK REFERENCE TROUBLESHOOTING

PROBLEM AIR ENTERING THE FILTER SYSTEM

CORRECTION The following conditions in your filter system that allow air to enter and corrections for each condition:

1. Due to low water level in pool, skimmer doesn't have enough water in it and pump pulls in air along with an insufficient amount of pool water.
 - Raise water level in pool.
2. Air bubbles and/or low water level in pump's hair and lint trap.
 - Check and raise water level in pool.
 - Skimmer basket is clogged with debris – clean it out.
 - Cracked/split suction cleaner hose – replace hose.
 - Leak in pump hair and lid – lubricate lid/replace lid.
 - Leak in pump suction line – replace line.
3. Air bubbles coming out of pool return line.
 - See 1 and 2 above.
4. Air is discharged from the air relief valve when the valve is opened and the pump is running.
 - See 1 and 2 above.

PROBLEM ELEMENTS LIMING UP

CORRECTION A stiffening of the elements' fabric caused by mineral deposits in the pool water. This is usually due to excessive deposits of magnesium, calcium or both.

1. Removal of the mineral deposits can be done by soaking the elements in a solution of 6 parts water and 1 part muriatic acid.

PROBLEM SHORT FILTER CYCLES

CORRECTION This is normal until the water in the pool has been initially cleaned.

1. Elements may be loaded with debris, oils, etc. Clean elements thoroughly.

PROBLEM PRESSURE DROPS IN GAUGE

CORRECTION If pressure drops on pressure gauge turn off the pump and make sure any automatic controls are turned off as well. Turn the motor shaft with your fingers. If it turns freely then the pump needs to be disassembled to check the impeller for clogs. If the impeller is not clogged and the shaft is not frozen (it moves freely) then there is an obstruction in the plumbing between the pool and the pump.

PROBLEM PRESSURE REMAINS HIGH AFTER BACKWASHING

CORRECTION If pressure remains high after backwashing the filter, backwash again. If still high you need to check for Liming (see Liming – up).

PROBLEM DIRT/DEBRIS IS CONTINUOUSLY ENTERING THE POOL

CORRECTION Check the internal components of the filter.

1. Inspect the elements for any tears or holes.
2. Inspect the internal air bleed sock for any tears or improper installation.
3. Inspect the elements and make sure they are seated properly between the upper and lower manifold.



TANK BAND INSTRUCTIONS

The Clamp installation instructions must be followed **EXACTLY** to prevent the lid from blowing off during initial startup, restart or filter operation.

BEFORE working on the Filter System complete the following steps.

- Turn the pump off and shut off any automatic controls.
- Open the air relief valve and wait for the pressure to be relieved.

1. Make sure the lid O-Ring is in position in the lower tank half. Press the filter lid over the lower tank half sandwiching the O-Ring between the 2 halves. See diagram (A)



2. Keeping the ends of the filter clamp apart, position the center of the filter clamp (the valley of the clamp) over both the upper and lower tank flanges (B). Carefully bring the ends together as you insert the T-bolt into the union located on the other side of the clamp assembly. See diagram (C)

3. Place the washer and the tension spring on the barrel nut. Hand tighten the nut. Keep checking the clamp for proper seating as you hand tighten the nut. See diagram (D)



4. Tighten the nut using a 7/8 inch wrench. See diagram (E). Be sure to tap around the outside of the clamp using a mallet or similar tool to ensure proper seating of the clamp. See diagram (F). Continue tapping and tightening until the coils in the spring touch each other. Do not tighten beyond that point.

5. The spring coils should be checked periodically – about once a month- to ensure that they continue to touch each other, indicating that the clamp is under sufficient tension. If they do not touch repeat step 4.

WARNING

YOUR FILTER OPERATES UNDER PRESSURE. THE FILTER MAY CAUSE SEVERE INJURY OR DEATH FROM TANK EXPLOSION.

YOU COULD BE SERIOUSLY INJURED OR KILLED IF YOU DO NOT FOLLOW THE INSTRUCTIONS AND WARNINGS THAT COME WITH YOUR FILTER.

IF YOUR FILTER HAS A PRESSURE RELIEF VALVE, YOU MUST USE THIS VALVE TO RELEASE ALL PRESSURE IN THE FILTER BEFORE DISASSEMBLING THE FILTER. FAILURE TO DO SO CAN RESULT IN SEVERE PERSONAL INJURY OR DEATH.

READ FILTER OWNERS MANUAL COMPLETELY BEFORE DOING ANYTHING TO THE FILTER