WASTEWATER EVAPORATOR
OWNER’S MANUAL

YOUR DEALER IS:

OR CALL HYDRO-BLAST, INC.
1-800-332-1590

Hydro-Blast, Inc.
10250 SE Mather Rd.
Clackamas, OR 97015
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</table>
Read All Instructions Before Using This Wastewater Evaporation System.

WARNING: To reduce the risk of fire, electric shock, or injury to persons when using your evaporator, follow basic precautions including the following:

**THIS UNIT IS HOT!**

* Never introduce toxic materials, solvents, flammables, or combustible materials with flash points below 300°F Fahrenheit into your Hydro-Blast™ Equipment. This may result in fire, explosion, injury or death. To do so voids all warranties, and is a violation of the law!

* Never reach into the Wastewater Evaporation System when the unit is on.

* Use the Wastewater Evaporation System only for its intended purpose as described in this manual.

* This unit must be properly installed and located in accordance with the Installation Instructions before it is used.

* Properly ground to conform to all governing codes and ordinances.

* Follow details in Installation Instructions.

* Connect to a properly rated, protected, and sized power-supply circuit to avoid electrical overload.

* Exhausting to the outside is required on all units.

* Keep area around and underneath your Wastewater Evaporation System free from the accumulation of combustible materials, such as paper, rags, & chemicals.

* Keep the floor around the unit clean and dry to reduce the possibility of slipping.

* Never climb on or stand on your Wastewater Evaporation System.

* Unplug or disconnect the unit from the power supply before attempting any maintenance.

* Do not operate the Wastewater Evaporation System if it is damaged, malfunctioning, partially disassembled, or has broken parts, including a damaged cord or plug.
Help us help you....

Before using Your Wastewater Evaporation System, Read this manual carefully.

This manual is intended to help you operate and maintain your new Wastewater Evaporation System properly. Keep it handy for answers to your questions.

If you don’t understand something or need more help, call your installing dealer or call Hydro-Blast™ at 1-800-332-1590.

If you receive a damaged Evaporator System....

Immediately contact both the carrier and Hydro-Blast™. Hydro-Blast™ assumes no liability for damage or loss after delivery to a common carrier. Inspect all shipments upon receipt. If the crate has been damaged, note this on your receiving paperwork from the shipper. Do not put the equipment into service until the carrier inspects it, and the carrier agrees to pay for the damage and the repairs have been made. Hydro-Blast™ will assist you in collection of your claim against the carrier.

Record the model and serial number of your Wastewater Evaporation System.

You’ll find this information on a label on the back of the electrical box. If the label is missing the serial number can also be found stamped on the lip of the tank. Call your dealer or the factory to answer any questions.

Model Number

Serial Number

Power: Voltage/Phase/Amps
Hydro-Blast™ products are built under strict quality assurance standards and backed by years of experience in the manufacture of quality industrial cleaning equipment.

All Hydro-Blast™ Wastewater Evaporation Systems are warranted to be free from defects in material and workmanship for a period of one year from the date of original sale. All evaporators are designed for indoor use only. Some components in the evaporator are not designed for wash down duty and present high potential for electrical shock when wetted. All warranties will be null and void if installed outdoors. This warranty does not cover damage or defects caused by improper selection, installation, use, care, or repair of the product. See Specifications in Owner’s Manual. Use of repair parts not manufactured or supplied by Hydro-Blast™ may void your warranty. The waste stream should remain consistent with the Material Stream Analysis (MSA) performed at the time your Wastewater Evaporation System was quoted, or you may void your warranty. If you purchased a Wastewater Evaporation System without performing an MSA, there is no warranty on wetted parts.

WASTE STREAM ANALYSIS

Normally, early in the sales process, a waste stream is analyzed for its chemical composition. The Hydro-Blast™ Applications Division then utilizes the waste stream data to determine the appropriate materials of construction for the most cost-effective operating life. In addition, Hydro-Blast™ also uses the waste stream analysis to determine potential operational difficulties such as scaling, chloride corrosion, concentrated waste disposal concerns, potential volume reduction, pretreatment necessities, etc. This data also establishes the base line of chemical exposure for this application. Without any waste stream analysis data to assist in appropriate metal specification, Hydro-Blast™ cannot issue a wetted part warranty and the operational responsibility rests with the end user.

OPERATIONAL CONSIDERATIONS

Large waste stream volume reductions without cleaning can cause large quantities of sludge to accumulate in the evaporator. Accumulated sludge can significantly reduce the heat transfer capability of the floor (especially during startup). Reductions in heat transfer to the liquid in a high rate evaporator can also cause scaling of the floor that further impairs the heat transfer capability. Typically, the first evidence of scaling is that the floor begins to show a difficult to remove solid coating, which serves to reduce the heat transfer capability of the evaporator. The evaporator should be cleaned whenever accumulated solids, (sludge) reach 1 inch in depth or if there is any scaling. Regular cleaning of the tank will improve heat transfer, evaporation rate and extend evaporator life. If solids buildup or scaling is allowed to continue without being addressed or the unit operated for extensive periods without cleaning, the evaporator could suffer damage from a buckled or split floor.

OPERATION INSTRUCTIONS

Your Hydro-Blast™ Wastewater Evaporation System has been engineered to provide protection from injury to operators. Hydro-Blast™ is not responsible for personal injury or property damage resulting from operation of this equipment. All operators are required to read and understand the Owner’s Manual and any other printed instructions prior to operating this evaporator. Improper Operation Could Result In Bodily Injury Or Death In Addition To Damage To The Equipment and/or Other Property.
WARRANTY REGISTRATION
Fill out and return your warranty registration upon receipt of your Wastewater Evaporation System. It may be important to contact you in the future and registration validates your warranty. Model number and serial number are on the back of the electrical control box.

WARRANTY REPAIR WORK
If your Hydro-Blast™ Wastewater Evaporation System fails to function properly, call your Hydro-Blast™ Dealer or the factory. Many problems can be solved over the phone. Your one-year warranty entitles you to repairs by your local dealer or a factory technician within your dealer area. Labor is not included. Do not hire an outside contractor for warranty repair without written authorization from Hydro-Blast™. This warranty excludes any and all incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. This warranty gives you specific legal rights. You may have other rights, which will vary, from state to state.

RETURNED GOODS
No products will be accepted for return without a Returned Goods Authorization (RGA) number. If Hydro-Blast™ grants an RGA, all parts must be shipped freight prepaid. Write the RGA number on the package. Non-warranty returns are subject to a 15% handling fee. If a part or machine is replaced at no charge under warranty, the defective item must be returned to Hydro-Blast™ within 30 days of ship date of replacement parts sent to receive credit. Replacement parts will be invoiced at the existing price if not returned within the 30-day period.

SCHEDULED MAINTENANCE
Hydro-Blast™ recommends that the floor of the evaporator be inspected as a regular maintenance function to determine the condition of the floor. These inspections will assist in specifying the appropriate maintenance schedule for the evaporator. The level of maintenance performed on it usually determines the operating life of an evaporator. Safety features, such as, the Over-Temp control, are designed to be constantly vigilant to prevent damage to the unit from overheating resulting from inadequate maintenance.

ELECTRIC EVAPORATOR HEATING ELEMENTS
Heating elements and associated fuses for electric evaporators will be warranted for a period of 90 days from original date of sale. They are considered a consumable item.

DO NOT OPERATE THE EVAPORATOR UNLESS ALL OF THE SAFETY FUNCTIONS ARE IN PLACE AND FUNCTIONING.
MODIFICATION OR TAMPERING WITH ANY OF THE OPERATING CONTROLS WILL NULLIFY ALL WARRANTIES.

This Warranty Is Expressly Made In Lieu Of Any And All Other Warranties Expressed Or Implied Including The Warranties Of Fitness For A Particular Purpose.
INSTALLATION INSTRUCTIONS

Location
1. Install the Hydro-Blast™ Wastewater Evaporation System in an adequately ventilated indoor location. The unit must be clear of all-flammable materials, liquids or gases. Do not place the unit near wash racks, steam cleaners or pressure washers, or in areas that are subject to hose downs or splashing water.

2. Place the unit with a minimum of two (2) feet of clearance on the back and right hand sides. The left hand side of the unit must have a minimum of three (3) feet of clearance.

3. Keep access to the drain clear.

4. Do not install or operate the unit on or near flammable materials. The unit contains switches and contactors that may spark when turning on and off. The bottom of the unit will become hot when in use.

5. For batch feeding fluid through the lid, please provide yourself with adequate room around the unit.

Note: GAS FIRED UNITS
The gas burner models covered by this manual should not be installed in a location where normal air circulation or infiltration is limited. Adequate circulation or infiltration air is necessary for proper combustion. CAUTION: DO NOT INSTALL IN A NEGATIVE PRESSURE ENVIRONMENT. Installing a unit in a tightly closed room without ventilation openings to outdoors, or other rooms, requires supplying air for combustion through special openings, one near the floor line and the other near the ceiling. Each opening should be sized on the basis of one square inch or more of free area for each 1000 BTU input per hour. In the case of the Model 1500 evaporator, at the rate of approximately 175,000 BTU/HR., that computes to at least two 175 square inch openings.

Electrical Connection
1. ENSURE ALL SWITCHES AND ELECTRICAL CONTROLS ARE “OFF”.

2. Connect the unit to an electrical source that is properly fused and rated for the amperage and voltage requirements stated on the serial number tag that is located on the back of the electrical control box. Check labeling to verify requirements.

Vent Duct: ELECTRIC HEATED UNITS
The vent duct should be as short as possible. Design your vent stack with as few bends as possible. This duct should exhaust to the atmosphere outside the building. Ducting materials may be PVC or metal construction. Check local codes.
Vent Duct: GAS FIRED UNITS
1. The draft inducer installed on this machine provides a positive pressure to the exhaust stack. Before using the Gas-fired evaporator, connect the correct size metal flue pipe to the vent stack on top of the evaporator. The pipe diameter should be equal to or greater than the exhaust stack on the unit. The flue pipe should be as short as possible and with as few bends as possible. This duct must exhaust to the atmosphere outside the building.
2. The flue pipe should be sized and rated to carry enough exhaust as not to restrict the flow.
   * The minimum requirement should be no smaller than the existing stack, and larger when lengths of greater than 20 feet of straight exhaust are required.
   * Bends and elbows require even larger flue sizing since they are restrictive. A common rule of thumb is: the restriction of each elbow is equal to ten feet of straight exhaust piping.
   * If the flue pipe needs to be run horizontally, the pitch of the pipe should be 1/4 inch per foot of length minimum. The horizontal run of the pipe should not exceed the height of the chimney above the flue connection. As an example, a ten-foot horizontal run should rise 2 1/2 inches horizontally, and the minimum chimney length shall be at least ten feet.
   * Insure that the stack piping meets local codes for a draft induced gas appliance. In most cases, codes are met with B-Vent gas venting of the appropriate size.

Gas Supply Piping
*DO NOT EXPOSE THE GAS VALVE ON THE UNIT TO TEST PRESSURES, AS DAMAGE WILL RESULT IF PRESSURE EXCEEDS 1/2 PSI.*

A qualified installer, service agency, or the gas supplier must perform installation and service.

Notice: All supply piping must comply with local codes.

The diameter of the pipe must be sized to supply enough volume of gas to the burners. Check with your local gas service agency to determine the size of gas supply piping required.

<table>
<thead>
<tr>
<th>Consumption rates are as follows:</th>
<th>Factory installed piping input size:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MODEL</strong></td>
<td><strong>RATE</strong></td>
</tr>
<tr>
<td>1500</td>
<td>175,000 BTU/HR.</td>
</tr>
<tr>
<td>2500</td>
<td>285,000 BTU/HR.</td>
</tr>
<tr>
<td>5500</td>
<td>686,000 BTU/HR.</td>
</tr>
</tbody>
</table>

**Input gas pressure required:**

<table>
<thead>
<tr>
<th><strong>MODEL</strong></th>
<th><strong>MINIMUM</strong></th>
<th><strong>MAXIMUM</strong></th>
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<tr>
<td>1500 N.G./L.P.</td>
<td>5.5” W.C.</td>
<td>14” W.C.</td>
</tr>
<tr>
<td>2500 N.G./L.P.</td>
<td>5.5” W.C.</td>
<td>14” W.C.</td>
</tr>
<tr>
<td>5500 N.G./L.P.</td>
<td>5.5” W.C.</td>
<td>14” W.C.</td>
</tr>
</tbody>
</table>

1. The 1/8” NPT pressure tap for determining gas supply pressure to the burners is located on the inlet side of the combination gas valve. Use a “U” tube manometer or dial type pressure gauge scaled from 0” to 15” W.C.
2. An intermediate main gas regulator must be installed as close to the burners as possible to prevent fluctuations in burner output. A leak down test should be performed on all new installations.

Initial Gas Burner Use
1. After the burner has been in operation for ten minutes and the combustion chamber is fully warmed, take combustion analysis flue gas samples. Samples should be taken just ahead of the draft inducer in the flue pipe while the unit is running.

2. Perform the following combustion analysis. (All adjustments below must be made with the following instruments, a draft gauge, $O_2$ or $CO_2$ analyzer and CO tester.)

   * Adjust the primary air shutter to provide about 25% excess combustion air. Confirm this by checking the flue gas for its free oxygen or carbon dioxide percentages with an orstat or equivalent test instrument.
   * Free oxygen should be about 4.5%, or carbon dioxide should be about 9.5% for natural gas, 12.1% for propane gas.
   * Carbon monoxide should be checked for its presence in the flue gas. This percentage should not be over .04% or 400 PPM.

SAFETY PRECAUTIONS
1. Do not allow the evaporator to run in a “dry” state. This can lead to serious damage to the unit’s floor and inner walls.

2. Never introduce toxic materials, solvents, flammables, or combustible materials with flash points below 300° Fahrenheit into your Hydro-Blast™ Equipment. This may result in fire, explosion, injury or death. To do so voids all warranties, and is a violation of the law!

3. Be very cautious while working around the vent fan. Stack temperatures can reach 400° F. on gas units.

Manifold Pressure Adjustment
The manifold pressure is factory set and tested at near sea level. Different elevations and local conditions make it necessary to monitor the manifold pressure to verify an adequate supply of gas to the burner, at the time of installation.

See page 20 for orifice sizes and pressure setting.

* The 1/8” NPT tap for orifice manifold pressure measurement is located on the outlet side of the combination gas valve. Use a “U” tube manometer or dial type pressure gauge, scaled from 0” to 15” W.C.
Automatic Fill Pumps

Electric Self Priming 1/2H.P. Cast Iron Pump

Equipment Misuse Hazard
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated component in your system.
- Do not use with fluids that contain chemicals that are incompatible with Viton®, EPDM, CPE, Polypropylene, PVC or PTFE.

Wastewater Plumbing
1. Use the shortest and most direct suction pipe or hose practical. Suction height will have a negative effect on pump flow. The higher the lift, the more dramatic the reduction will be. Maximum practical suction lift is 20 feet vertically.
2. Protect the pump from freezing and water damage due to flooding.
3. The suction inlet for the pump is 1.5” NPT. The suction pipe should be equal in size to the suction connection of the pump. For hose applications, use reinforced type that will not collapse under suction. Use thread sealer to make sure all suction connections are airtight.
4. Attach a suction strainer to the end of the suction pipe or hose. Be sure to keep the suction end submerged. Periodically ensure the suction strainer is not clogged.
5. A valve in the suction is necessary only on positive suction head installation and must not be used to throttle the pump. This suction valve should be installed for maintenance purposes only.
6. If the system will allow back siphoning to liquid source, a check valve must be installed. (An inline discharge gauge is useful to check pump operation and indicate trouble.)

CAUTION-DO NOT RUN PUMP DRY.
Serious damage may result if started dry.

Priming
Priming depends on the height of the suction lift. The lower the suction lift, the quicker the pump will prime.
1. Remove the prime plug that is located on the top of the pump casing. Fill the casing with liquid. Reinstall prime plug in the casing.
2. Open suction valve if installed.
3. Start the pump by either pressing the MANUAL FILL button or rotating the Mode switch to the AUTO-FILL position.
4. When pump is operating at full speed open discharge valve slowly.
5. Allow sufficient time for pump to self-prime. The pump must evacuate air from suction pipe and lift water to pump case.
6. If pump does not prime properly, or loses prime during start-up, look for and problems before repeating priming procedure.
Electric 1/2H.P. Pump Troubleshooting Guide

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
</table>
| LOSS OF SUCTION       | 1. Air leak in suction.  
                         | 2. Suction head too high.                                                    | Repair or replace suction line.                       |
|                       |                                                                             | Reduce suction head.                                     |
| PUMP LEAKS            | Worn mechanical seal.                                                        | Replace seal.                                           |
| LITTLE OR NO DISCHARGE| 1. Casing not filled with water.                                             | Fill case with water.                                    |
|                       | 2. Total head too high.                                                      | Shorten suction lift/ and or discharge                   |
|                       | 4. Hole or leak in suction line not submerged deep enough in water.           | Repair or replace suction line.                         |
|                       | 5. Discharge hose kinked.                                                    | Straighten out to exhaust air.                          |
|                       | 6. Suction hose collapsed.                                                   | Replace with reinforced suction hose                    |
|                       | 7. Suction or discharge line valves closed.                                  | Open.                                                   |

Air Operated Diaphragm Pump

Equipment Misuse Hazard
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated component in your system. This pump has a 100 psi maximum working pressure at 100 psi maximum incoming air pressure.
- Do not use with fluids that contain chemicals that are incompatible with Buna-N rubber, EPDM, FKM, CPE, Polypropylene, PVC, or PTFE.

Wastewater Plumbing
1. Use the shortest and most direct suction pipe or hose practical. Suction height will have a negative effect on pump flow. The higher the lift, the more dramatic the reduction will be. Maximum practical suction lift is 25 feet vertically.
2. Protect the pump from freezing and water damage due to flooding.
3. The suction inlet for the pump is 1/2” NPT. The suction pipe should be equal to or larger in size to the suction connection of the pump. For hose applications, use reinforced type that will not collapse under suction. Use thread sealer to make sure all suction connections are airtight.
4. Attach a suction strainer to the end of the suction pipe or hose. Be sure to keep the suction end submerged. Periodically ensure the suction strainer is not clogged.
5. A valve in the suction is necessary only on positive suction head installation and must not be used to throttle the pump. This suction valve should be installed for maintenance purposes only.
6. If the system will allow back siphoning to liquid source, a check valve must be installed. (An inline discharge gauge is useful to check pump operation and indicate trouble.)
Air Plumbing Air Diaphragm Pump
1. Filtered shop air will need to be provided to the solenoid valve for the unit
2. The air operated diaphragm pump comes equipped with an air solenoid valve. The inlet size is 1/4” NPT.
3. DO NOT exceed 100 psi.

Warning
This equipment may generate fluid pressures equal to the air supply pressure. DO NOT exceed 100psi.

Bleed all pressure from air and fluid lines before disconnecting pump.

Air Diaphragm Pump Troubleshooting Guide

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump will not cycle, or cycles once and stops.</td>
<td>Air valve is stuck or dirty.</td>
<td>Remove air valve and clean. Use filtered air.</td>
</tr>
<tr>
<td>Pump cycles at stall or fails to hold pressure at stall.</td>
<td>Leaky check valves or o-rings.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>Worn check balls or duckbill valves or guides.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>Check ball wedged in guide.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td>Worn diaphragm shaft seals.</td>
<td>Replace.</td>
</tr>
<tr>
<td>Air bubbles in fluid.</td>
<td>Suction line is loose.</td>
<td>Tighten.</td>
</tr>
<tr>
<td></td>
<td>Diaphragm ruptured.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>Loose manifolds or damaged manifold o-rings</td>
<td>Tighten manifold bolts or nuts; replace o-rings.</td>
</tr>
<tr>
<td></td>
<td>Loose fluid side diaphragm plates.</td>
<td>Tighten.</td>
</tr>
<tr>
<td>Fluid in exhaust air.</td>
<td>Diaphragm ruptured.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>Loose fluid side diaphragm plates.</td>
<td>Tighten.</td>
</tr>
<tr>
<td></td>
<td>Worn diaphragm shaft seals.</td>
<td>Replace.</td>
</tr>
</tbody>
</table>
**Air Operated Piston Valves for Gravity Feed Systems**

**Equipment Misuse Hazard**
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated component in your system. This pump has a 100 psi maximum working pressure at 100 psi maximum incoming air pressure.
- Do not use with fluids that contain chemicals that are incompatible with FKM, EPDM, CPE, PVC, or PTFE.

**Wastewater Plumbing**
1. Use the shortest and most direct suction pipe or hose practical. Maximum height of storage tank is 400 feet above unit.
2. The Valve inlet for the pump is 3/4” NPT. The inlet pipe should be equal to or larger in size to the valve connection. Use thread sealer to make sure all suction connections are airtight.
3. If the system will allow back siphoning to liquid source, a check valve must be installed.

**Air Plumbing Air Operated Valves**
1. Filtered shop air will need to be provided to the solenoid valve for the unit
3. The air operated diaphragm pump comes equipped with an air solenoid valve. The inlet size is 1/4” NPT.
4. Pressure for the valve must be between 60 and 150 psi.

**Float Switch Installation**
1. All Auto-Fill units come equipped with a Float Switch to interrupt the system when the holding tank or sump drops to a low level.
2. Install the Float Switch into the tank the system will be fed from.
3. Add length to the cord if necessary and attach to the inner wall of the holding tank or sump.

All Auto Fill units come equipped with a momentary MANUAL FILL switch. If there is wastewater left in the holding tank or sump after the Float Switch has dropped and interrupted the system, the remaining water can be pumped into the evaporator.

1. Rotate the mode selector switch to the MANUAL position.
2. Depress the MANUAL FILL switch to run the pump and fill the unit.
3. Depress the START switch to evaporate the remaining water. The evaporator is now running the manual mode.
Auto-Fill Evaporator For Use With Customer's Pump

1. Evaporators equipped with Auto-Fill only, ordered without a pump or fill system, come standard with a pump contactor to control a customer supplied pump up to 1/2 H.P. at 120 VAC.

2. Do not exceed the maximum horsepower rating of 1/2 H.P. 120 VAC when wiring into the pump contactor.

3. If a pump larger than 1/2 H.P. needs to be used contact the factory for an upgrade to the stock system.

4. On systems of this type the pump contactor has been wired up to the input of the contact L1. Run the L1 lead of the external 120 VAC filling device to T1 on the pump contactor. Run the neutral lead (L2) to the L2 side of the distribution block (white wires). Ground to the ground lug on the electrical panel next to the distribution block.

It will be necessary to install a properly rated fuse for the filling device installed, into the pump fuse holder. Ex: 1/2 H.P. pump has F.L.A. rating of 7.2A. The correct fuse size would be an LPCC-15 amp fuse. If you have a problem obtaining the correct fuse contact the factory for assistance.
EVAPORATOR OPERATING INSTRUCTIONS

GOOD SAFETY PRACTICES MAKE GOOD SENSE!

1. *Never introduce toxic materials, solvents, flammables, or combustible materials with flash points below 300°F Fahrenheit into your Hydro-Blast™ Equipment. This may result in fire, explosion, injury or death. To do so voids all warranties, and is a violation of the law!*

2. Be careful around the unit. Surface temperatures can get quite hot! The vent stack is very hot.

3. Make sure that the unit exhausts all steam to the atmosphere outside of the building. The evaporator has a negative pressure and it will exude no fumes or odors inside a building when properly vented.

4. If there is detergent or other alkaline materials in the wastewater, it may foam and boil over. This can be eliminated with an appropriate anti-foam or pH control.

5. Wastewater temperatures will normally not exceed 215° F. The sludge may become hotter once it has dried. Be careful of flash points. **NEVER EVER LET THE EVAPORATOR RUN DRY!**

6. Dispose of all sludge according to Federal and State environmental regulations.

Operation for Units Without Autofill

1. Fill the unit to a wastewater height eight (8) inches below the top lip. If large amounts of sludge are anticipated, start with a smaller quantity of liquid. Sludge build up on the bottom of the unit will turn the evaporator off and can cause severe damage to the floor.

2. If you unit is equipped with an oil skimming system remove oil from the surface of you wastewater by rotating the OIL REMOVAL switch to the “ON” position. Skim the oil when the unit is COLD. Turn off the oil belt by rotating the OIL REMOVAL switch to the ”OFF” position.

3. Rotate the mode selector switch from the OFF position to the ON position.

4. Depress the DISPOSAL START switch.
   - GAS FIRED: The burner contactor will energize and activate the burner and exhaust fan simultaneously. The burner will go through a pre-purge cycle before lighting. (Approximately 35 seconds.)
   - ELECTRIC: The heating element contactors with energize and activate the electric heating elements. The “VENT FAN” does not turn on automatically. Use the “VENT FAN” switch to exhaust steam a required.

5. When the unit has evaporated the wastewater down below the low water shut-off probe it will automatically shut-off and the cycle complete pilot light will turn on.

6. The remaining 1-2” of slurry or sludge must be removed and the floor cleaned at this time. Do not drain the remaining waste back into the holding tank that feeds the evaporator under any circumstances. The remaining waste has a very high potential of dissolved solids, which can cause premature scaling of the evaporator floor.

7. After proper cleaning, the unit may now be filled and the evaporation process started over again.

8. The unit may be shut-off at anytime by rotating the mode selector switch to the OFF position.
Low Water Shut-Off Probe Sensitivity Adjustment
1. Ensure all switches and buttons are in the off position.
2. Disconnect unit from power supply before performing work on the electrical components of the unit.
3. Open the door of the electrical enclosure, allowing access to the electrical components of the unit. The Low Water Shut-Off Module is mounted to the DIN rail and has an "LW" label.
4. An adjustment pot is located on the module. The adjustment pot will adjust the sensitivity level of the conductance probes. A scale is printed on the module to help you make the adjustments. Larger numbers represent a more sensitive probe.
5. Close the electrical enclosure door and latch shut.
6. Restore power to the unit. Continue with standard operating procedures.

Description of the Auto-Fill Option
The Auto-Fill option is designed to automatically fill and evaporate your wastewater on a continual basis. This is accomplished through the use of an added control board and four level sensing conductance probes. The probes are mounted in a box located on top of the unit. In Auto-Fill mode the unit will call for water turning on an external pump or solenoid valve. The burner will automatically turn on when the water reaches the low water shut-off probe while filling. Once the high-level conductance probe has been reached, filling will cease. The wastewater will evaporate down to the low level probe at which time the unit fills again. When the unit has reached the predetermined number of cycles the unit will evaporate the wastewater down to the cycle complete probe that is two (2) inches off of the floor. The unit will automatically shut off. Depress the CYCLE RESET button to reset the unit.

Auto-Fill Operation
1. Depress the Cycle Complete button to clear the system.
2. Rotate the mode selector switch to the AUTOFILL position. It will not be necessary to depress the START switch when in the Auto Fill mode. The evaporator will begin to fill with wastewater until the high probe is reached then shut off power to the filling device.
3. The unit will energize as soon as the low water shut-off probe has been reached by the wastewater.
   • GAS FIRED: The burner contactor will energize and activate the burner and exhaust fan simultaneously. The burner will go through a pre-purge cycle before lighting. (Approximately 35 seconds.)
   • ELECTRIC: The heating element contactors with energize and activate the electric heating elements. The “VENT FAN” does not turn on automatically. Use the “VENT FAN” switch to exhaust steam a required.
4. After the evaporator has evaporated the batch of water below the level of the low level probe it will automatically refill with wastewater to the level of the high level probe. The burner will remain on during the refilling process.
5. The evaporator will refill with wastewater on a continual basis until the unit has reached the predetermined number of cycles the unit will evaporate the wastewater down to the cycle complete probe that is two (2) inches off of the floor. The unit will automatically shut off and the Cycle Complete light will illuminate. (If the Float Switch drops because the sump or holding tank goes dry this will open the internal switch and interrupt the signal to the fill
The evaporator will continue to evaporate the wastewater until the level is below the low water shut-off probe. The unit will then automatically shut off.

6. The remaining 1-2” of slurry or sludge must be removed and the floor cleaned at this time. Do not drain the remaining waste back into the holding tank that feeds the evaporator under any circumstances. The remaining waste has a very high potential of dissolved solids, which can cause premature scaling of the evaporator floor.

7. After proper cleaning, the Auto-Fill evaporation process can be started over again.

8. The unit may be shut-off at anytime by rotating the mode selector switch to the OFF position.

**Manual Operation for Units With Autofill**

1. Fill the unit to a wastewater height eight (8) inches below the top lip. If large amounts of sludge are anticipated, start with a smaller quantity of liquid. Sludge build up on the bottom of the unit will turn the evaporator off and can cause severe damage to the floor.

2. If your unit is equipped with an oil skimming system remove oil from the surface of your wastewater by rotating the OIL REMOVAL switch to the “ON” position. Skim the oil when the unit is COLD. Turn off the oil belt by rotating the OIL REMOVAL switch to the “OFF” position.

3. Rotate the mode selector switch from the OFF position to the ON position.

4. Depress the START switch.
   - GAS FIRED: The burner contactor will energize and activate the burner and exhaust fan simultaneously. The burner will go through a pre-purge cycle before lighting. (Approximately 35 seconds.)
   - ELECTRIC: The heating element contactors with energize and activate the electric heating elements. The “VENT FAN” does not turn on automatically. Use the “VENT FAN” switch to exhaust steam as required.

5. When the unit has evaporated the wastewater down below the low water shut-off probe it will automatically shut-off.

6. The remaining 1-2” of slurry or sludge must be removed and the floor cleaned at this time. Do not drain the remaining waste back into the holding tank that feeds the evaporator under any circumstances. The remaining waste has a very high potential of dissolved solids, which can cause premature scaling of the evaporator floor.

7. After proper cleaning, the unit may now be filled and the evaporation process started over again.

8. The unit may be shut-off at anytime by rotating the mode selector switch to the OFF position.

**Auto-Fill Cycle Count Setting Procedures**

1. Ensure all switches and buttons are in the off position.

2. Disconnect the unit from the power supply before performing work on the electrical components of the unit.

3. Remove the screws that hold the electrical enclosure door shut. Open the door allowing access to the electrical components of the unit. The Auto-Fill Cycle Count Board is located at the bottom of the electrical panel.

4. Set the binary counter located on the Auto-Fill Cycle Count Board to the desired number of counts plus one. (An extra count is needed to account for the initial filling of the unit.)

5. Close the electrical enclosure door and replace the screws that hold it shut.
6. Restore power to the unit. Push the manual fill button to fill with water until you cover the bottom lowest three probes. Push the count reset button. Then turn your mode selector switch to AUTOFILL. The tank should automatically start to fill to the high level probe. At the same time the burner circuit will initiate the burner to turn on.

7. After the evaporator has evaporated the pre-set number of cycles on the counter, the machine will continue to burn down to just below the cycle complete probe. The unit will then shut off. Let the unit cool down before cleaning. After the tank has been cleaned and scraped out, you are ready to refill and start the evaporator cycle again. Press the cycle count reset button, and cycle over again, proceeding as described in step 6.

Auto-Fill Probe Sensitivity Adjustment
1. Ensure all switches and buttons are in the off position.
2. Disconnect unit from power supply before performing work on the electrical components of the unit.
3. Open the door of the electrical enclosure, allowing access to the electrical components of the unit. The Low Water Shut-Off Module is mounted to the DIN rail and has an "AF" label.
4. An adjustment pot is located on the module. The adjustment pot will adjust the sensitivity level of the conductance probes. A scale is printed on the module to help you make the adjustments. Larger numbers represent a more sensitive probe.
5. Close the electrical enclosure door and latch shut.
6. Restore power to the unit. Continue with standard operating procedures.

Shutting Down The Evaporator
The unit may be shut-off at anytime by rotating the mode selector switch to the OFF position.

Vent Fan Operation
GAS FIRED: The vent fan is activated when the evaporator is started.
ELECTRIC: The vent fan is activated manually using a switch on the panel.
SAFETY DEVICES

Low Water Shut-Off
The low water shut-off system will turn off the burner(s) when the wastewater has evaporated down to two (2) inches above the floor at the probe location. As a result the life of the evaporator floor increases by not allowing the evaporator to be run in a dry state.

WARNING!
*Do not adjust the probes lower than two (2) inches. Otherwise the probes will end up immersed in sludge, which will cause the burner(s) to remain on after the all of the water has evaporated causing severe damage to the evaporator floor.*

Over Temperature Switch
The over temperature switch is a back up device located in a box below or behind the main electrical enclosure. In the event the low water shut-off fails the over temperature switch will shut off the burner(s). If the over temperature switch is tripped press the red, manual reset button on the over temperature switch.

Overfill Alarm Probe
This feature is included on units with the Auto-Fill option. An alarm probe triggers an 85-decibel alarm if the evaporator continues to fill above the level of the high level probe while the unit is in Auto-Fill mode.
MAINTENANCE

Conductance Probe Cleaning
1. Clean the conductance probes on a weekly basis for reliable operation.
2. Once the evaporator has shut off and cooled down turn the mode selector to the OFF position.
3. Remove the two nuts holding the box down and remove it from the top of the unit.
4. Wipe the probes with a light solvent or cleaner that will not leave any residue behind.
5. Replace the box and tighten the two nuts.

Scale and Sludge Removal
Large waste stream volume reductions without cleaning can cause large quantities of sludge to accumulate in the evaporator. Accumulated sludge can significantly reduce the heat transfer capability of the floor (especially during startup). Reductions in heat transfer to the liquid in a high rate evaporator can also cause scaling of the floor that further impairs the heat transfer capability. Typically, the first evidence of scaling is that the floor begins to show a difficult to remove solid coating, which serves to reduce the heat transfer capability of the evaporator. The evaporator should be cleaned whenever accumulated solids reach 1 inch in depth or if there is any scaling. Regular cleaning of the tank will improve heat transfer, evaporation rate and extend evaporator life. If solids buildup or scaling is allowed to continue without being addressed or the unit operated for extensive periods without cleaning, the evaporator could suffer damage from a buckled or split floor.

1. In order to clean out the evaporator all of the wastewater in the tank must be evaporated down to the low water shut-off level, (set at two (2) inches from the bottom of the floor). If your evaporator is not equipped with this option, the wastewater level must be checked periodically to prevent the floor from going to a dry state.
2. Once the evaporator has shut off and cooled down turn the mode selector to the OFF position
3. Drain out the remaining wastewater into a sealed 55-gallon drum. Do not drain the remaining wastewater back into the holding tank that feeds the evaporator under any circumstances. The remaining wastewater has a very high potential of dissolved solids, which can cause premature scaling of the evaporator floor.
4. Scoop out the solids and sludge with a shovel or similar device. Use a wet/dry vacuum if necessary.
5. Inspect the floor for scaling by scribing the floor with a sharp putty knife. Check several areas as scale will typically buildup on the hottest part of the floor. Particularly several inches from the discharge of the burner(s).
6. If scaling has occurred use a sharp rigid putty knife or similar device to remove the buildup until you can clearly see the metal of the floor.
7. After proper cleaning, the unit may now be filled and the evaporation process started over again according to the proper operation instructions.
## Electrical Service Requirements

### Electric Heated Units

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage, Phase and Full Load Amps</th>
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</thead>
<tbody>
<tr>
<td>1000</td>
<td>240 VAC, Single Phase, 45 amp</td>
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<tr>
<td></td>
<td>240 VAC, Three Phase, 31 amp</td>
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<tr>
<td></td>
<td>480 VAC, Three Phase, 23 amp</td>
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<td>1500</td>
<td>240 VAC, Three Phase, 72 amp</td>
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<td>480 VAC, Three Phase, 37 amp</td>
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### Gas Heated Units

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<tr>
<td>2500</td>
<td>120 VAC, Single Phase, 20 amp</td>
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<tr>
<td>5500</td>
<td>120 VAC, Single Phase, 26 amp</td>
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### Electric Burner Ratings

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<th>Model</th>
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### Gas Burner Ratings

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<thead>
<tr>
<th>Model</th>
<th>Burner Model</th>
<th>Quantity</th>
<th>Natural Gas Orifice Size</th>
<th>Natural Gas Manifold Pressure in inches of Water</th>
<th>Liquid Propane Orifice Size</th>
<th>Liquid Propane Manifold Pressure in inches of Water</th>
<th>Burner Rating in Btu/hr</th>
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<td>2.5W.C.</td>
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**Conductance Probe Lengths**

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<tr>
<th>MODEL</th>
<th>Common</th>
<th>Low Water Shut Off</th>
<th>Cycle Complete</th>
<th>Cycle Low Level</th>
<th>Cycle High Level</th>
<th>Alarm</th>
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*Probe Lengths are measured from the top of the mounting block to the end of the probe. Units are inches.*